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HIGHER SECONDARY SECOND YEAR

COMPUTER SCIENCE

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CONTENTS

UNIT – I

CHAPTER 1

FUNCTION

PART A

CHOOSE THE BEST ANSWER:

1. Choose the correct pair
   a) Pure function - calling functions b) Impure function - side-effects
   c) Subroutine - parameters d) Implementation - Algorithm
2. If a function is not a recursive one, then is used _____.
   a) abc b) gcd c) let d) let rec
3. Which of the following type is can help with explicitly debugging
   a) Annotating b) Compiling c) Debugging d) Interpreting
4. Which of the following defines what an object can do?
   a) Operating System b) Compiler c) Interface d) Interpreter
5. Which of the following carries out the instructions defined in the interface?
   a) Operating System b) Compiler c) Implementation d) Interpreter
6. In b = 0, is _____ operator.
   a) Assignment b) equality c) logical d) not equal
7. In object oriented programming language, an _____ is a description of all functions that a class must have.
   a) object b) class c) Interface d) code
8. How many parameters are defined in the function let rec gcd a b : = _____.
   a) 0 b) 1 c) 2 d) 3
9. Identify the statement which is wrong.
   a) Definitions are expressions b) Definitions are distinct syntactic blocks
   c) Definitions can have expressions, nested inside them. d) Definitions can have expressions
10. Match the following:

(1) Keyword	(i) Xy
(2) Recursion	(ii) Odd
(3) Function name	(iii) Rec
(4) Parameters	(iv) let

   a) 1 - (iv), 2 - (iii), 3 - (ii), 4 - (i) b) 1 - (iv), 2 - (i), 3 - (ii), 4 - (iii)
   c) 1 - (i), 2 - (iv), 3 - (ii), 4 - (iii) d) 1 - (i), 2 - (ii), 3 - (iii), 4 - (iv)
11. Which of the following is an instance created from the class?
   a) parameter b) function c) subroutines d) object
12. Assertion (A): The variable used inside the function may cause side effects though the functions which are not passed with any arguments.
   Reason (R): When a function depends on variables or functions outside of its definition block.
   a) Both A and R are True, and R is the correct explanation for A
   b) Both A and R are True, but R is not the correct explanation for A
   c) A is True, but R is False d) A is False, but R is True
13. Assertion (A): A function is a unit of code that is often defined within a greater code structure.
   Reason (R): A function contains a set of code that works, on many kinds of inputs and produces a concrete output.
   a) Both A and R are true, and R is the correct explanation for A
   b) Both A and R are True, but R is not the correct explanation for A
   c) A is True, But R is False d) A is False, But R is True
14. _____ are the variables in a function definition.
   a) Arguments b) Parameters c) Identifiers d) Operators
15. Which type of function the return type is solely depends on its argument passed
   a) Pure b) impure c) Recursive d) user defined
16. In object oriented programs _____ are the interface.
   a) Implementation b) parameters c) Interface d) Arguments

17. The values which are passed to a function definition are called
a) Arguments b) Subroutines c) Function d) Definition
18. Subroutines are called as _____
a) Algorithm b) Parameters c) Interface d) Functions
19. The functions which will give exact result when same arguments are passed are called
a) Impure functions b) Partial Functions c) Dynamic Functions d) Pure functions
20. The defines an object's visibility to the outside world.
a) object b) interface c) pure function d) Impure function
21. In object oriented programs, how the object is processed and executed is _____ .
a) Implementation b) Interface c) recursion d) function
22. The variables in a function definition are called as
a) Subroutines b) Function c) Definition d) Parameters
23. Which of the following keyword is introduced function definition
a) let b) def c) rec d) fn
24. Find the impure function from the following.
a) sin (0) b) square x c) strlen (s) d) none of these
25. Which of the following is a unit of code that is often defined within a greater code structure?
a) Subroutines b) Function c) Files d) Modules
26. The accelerator is the _____ between the driver and the engine.
a) interface b) object c) instruction d) code
27. The formula should be written after _____ sign.
a) + b) — c) = d) ++
28. The name of the function in let rec pow ab : = is _____.
a) let b) rec c) pow d) a b
29. Find the correct statement from the following.
a) a : = (24) has an expression b) (24) is an expression
c) (22) is an expression d) (24) a is an expression
30. Pick the odd one out
a) Pseudo code b) Operating system c) Programs d) Modules
31. Explicitly _____ the types can help with debugging.
a) defining b) annotating c) informing d) computing
32. Which of the following is a description of all functions in object oriented programming language?
a) Implementation b) parameter c) Interface d) Argument
33. Choose the incorrect statement
a) Subroutines are the basic memory type of the computer
b) Parameters are the variables in a function
c) Arguments are the values which are passed to a function definition
d) Definition are distinct syntactic blocks
34. Why is the function random() is a impure function?
a) It gives different outputs for same function call b) It gives different outputs when 0 is given
c) It will not give different output d) None of these
35. In which type of function the return type does not solely depends on its argument passed?
a) Pure b) Parameterized c) Impure d) Monochromatize
36. Find the name of the function. let rec even x : =_____.
a) let b) rec c) even d) x
37. Which type of function the return type does not solely depends on its argument passed
a) Pure b) Impure c) Recursive d) User defined
38. Find which is false.
a) All function definitions are static b) All function definitions are dynamic
39. Find the correct statement from the following function definitions. let rec p on a b : = _____.
a) data type of the parameters are given
b) data type of the parameters are not mentioned c) none of these
40. Which of the following are mandatory to write the type annotations in the function definition?
a) Curly braces b) Parentheses c) Square brackets d) indentations

41. In programming languages, subroutines are called as _____.
a) Functions b) Task c) Modules d) Code
42. Stolen is an example _____ function.
a) user defined b) impure c) pure d) recursive
43. All functions are _____ definitions.
a) static b) dynamic c) algorithmic d) None of these
44. A function definition which call itself is called
a) user defined function b) built-in function c) derived function d) recursive function
45. Which are the variables in a function definition
a) Variables b) Arguments c) Functions d) Parameters
46. An _____ attributes and behavior is controlled by sending functions to the object.
47. In function definition post condition is given by _____.
a) needed b) let c) returns d) requires
48. Which of the following contains a set a code that works an many kinds of input and produces a concrete output?
a) Function b) Algorithm c) Arguments d) Language
49. The functions which cause side effects to the arguments passed are called
a) impure function b) Partial Functions c) Dynamic Functions d) Pure functions
50. Which of the following are the values which are passed to a function definition?
a) Parameters b) Algorithm c) Data types d) Arguments
51. An _____ is an instance created from the class.
a) object b) Functions c) Subroutines d) definitions
52. _____ are expressed using statements of a programming language.
a) Algorithm b) procedure c) Specification d) Abstraction
53. Which is a powerful concept in Computer science that allows programmers to treat code as objects.
a) Data abstraction b) Memory c) Mapping d) Accessibility
54. Which function definition, doesn't modify the arguments passed to them?
a) pure function b) Impure function c) object d) Interface
55. What must the used when a bulk of statements to be repeated for many number of times?
a) Algorithm b) Program c) Subroutines d) Parameters
56. The function definition is introduced by the keyword
a) def b) rec c) let d) infer
57. Which of the following in an instance created from the class
a) object b) function c) variable d) Recursive
58. Which of the following is an incorrect statement?
(i) Algorithms are not expressed using statements of a programming language.
(ii) An interface is a set of action that an object can do
(iii) Implementation does not carries out the instructions defined in the interface.
(iv) Pure functions will give exact result.
a) i and iii b) ii and iv c) iii and ii d) i, ii and iv
59. In function definition pre condition is given by _____.
a) needed b) let c) returns d) requires
60. _____ are the basic building blocks of a computer programs.
a) code b) subroutines c) modules d) variables
61. Evaluation of _____ functions does not cause any side effects to its output?
a) Impure b) pure c) Recursive d) built-in
62. Which of the following is an example of impure function?
a) Strlen() b) random() c) sqrt() d) pure()
63. Pick the odd one out
a) Curly braces b) Parentheses c) Functions d) Square brackets
64. Choose the incorrect pair
a) Parameters - Variable b) Arguments – Values
c) Compiling - Debugging d) Interface - Action
65. The function random() is an example for _____ functions.

66. Find the statement which is not true.
a) The interface defines an objects visibility to the outside world
b) Interface defines what an object can do
c) In object oriented programs, objects are interfaces

67. Which of the following bulk of statements to be repeated for many number of times
a) Algorithm b) Flow chart c) Coding d) Subroutines

68. _____ binds values to names.
a) Algorithms b) Variables c) Interface d) Definitions

69. In the function definition, the keyword let is followed by _____.
a) function name b) arguments c) parameters d) implementations

70. Find the correct statement.
a) Evaluation of pure function causes side effects to its output
b) Evaluation of Impure function causes side effects to its output.
c) none of these

71. Choose the correct statement
a) An interface is a set of variables
b) In object oriented programs classes are the interface
c) The interface defines an object's not visibility to the outside world
d) A class declaration is internal interface

72. A _____ combines the external interface with an implementation of that interface.

73. A function definition which call itself is called
a) Recursive function b) User defined function
c) Built-in-function d) Derived function

74. To define a recursive function, _____ is used.
a) let b) let r c) let rfn d) let rec

75. In which type of function the return type is solely depends on its argument passed?
a) pure b) impure c) parameterized d) monochromatize

ANSWERS

1. b) Impure function - side-effects
2. c) let
3. a) Annotating
4. c) Interface
5. c) Implementation
6. b) equality
7. c) Interface
8. c) 2
9. a) Definitions are expressions
10. a) 1 - (iv), 2 - (iii), 3 - (ii), 4 - (i)
11. d) object
12. b) Both A and R are True, but R is not the correct explanation for A
13. a) Both A and R are true, and R is the correct explanation for A
14. b) Parameters
15. a) Pure
16. c) Interface
17. a) Arguments
18. d) Functions
26. a) interface
27. c) =
28. c) pow
29. a) a : = (24) has an expression
30. b) Operating system
31. b) annotating
32. c) Interface
33. a) Subroutines are the basic memory type of the computer
34. a) It gives different outputs for same function call
35. c) Impure
36. c) even
37. b) Impure
38. b) All function definitions are dynamic
39. b) data type of the parameters are not mentioned
40. b) Parentheses
41. a) Functions
42. c) pure
43. a) static
44. d) recursive function
45. d) Parameters
51. a) object
52. a) Algorithm
53. a) Data abstraction
54. a) pure function
55. c) Subroutines
56. c) let
57. a) object
57. a) object
58. a) i and iii
59. d) requires
60. b) subroutines
61. b) pure
62. b) random()
63. c) Functions
64. c) Compiling - Debugging
65. impure
66. c) In object oriented programs, objects are interfaces
67. d) Subroutines
68. d) Definitions
69. a) function name
70. b) Evaluation of Impure function causes side effects to its output.
71. b) In object oriented

19. d) Pure functions 20. b) interface 21. a) Implementation 22. d) Parameters 23. b) def 24. d) none of these 25. b) Function	46. object 47. c) returns 48. a) Function 49. a) impure function 50. d) Arguments	programs classes are the interface 72. class declaration 73. a) Recursive function 74. d) let rec 75. a) pure

PART B

1 What is a subroutine?

Subroutines are the basic building blocks of computer programs. Subroutines are small sections of code that are used to perform a particular task that can be used repeatedly.

2 Define Function with respect to Programming language.

A function is a unit of code that is oft en defined within a greater code structure. Specifically, a function contains a set of code that works on many kinds of inputs, like variants, expressions and produces a concrete output.

3 What is Function?

Subroutines are the basic building blocks of computer programs. Subroutines are small sections of code that are used to perform a particular task that can be used repeatedly. In Programming languages these subroutines are called as Functions.

4 Write the inference you get from X:=(78).

- It is a function definition.
- The value 78 bound to the name 'X'.

5 What is parameter?

Parameters are the variables in a function definition and arguments are the values which are passed to a function definition.

6 What are the types of parameter?

- Parameter without Type
- Parameter with Type

7 Write a syntax for function definitions.

let rec fn a1 a2 ... an := k

Here the **'fn'** is a variable indicating an identifier being used as a function name. The names **'a1'** to **'an'** are variables indicating the identifiers used as parameters. The keyword **'rec'** is required if **'fn'** is to be a recursive function; otherwise it may be omitted.

8 What is called recursive function?

A function definition which call itself is called recursive function.

9 **Write a syntax for function types.**

x → y

x1 → x2 → y

x1 → ... → xn → y

10 Differentiate interface and implementation.

Interface:

Interface just defines what an object can do, but won't actually do it.

Implementation:

Implementation carries out the instructions defined in the interface.

11 What is called pure function?

- Pure functions are functions which will give exact result when the same arguments are passed.
- Evaluation of pure functions does not cause any side effects to its output.

12 What is called impure function?

The variables used inside the function may cause side effects though the functions which are not passed with any arguments. In such cases the function is called impure function.

13 Which of the following is a normal function definition and which is recursive function definition

i) let rec sum x y:

return x + y

Ans : recursive function

ii) let disp :

print 'welcome'

Ans : normal function

iii) let rec sum num:

if (num!=0) then return num + sum (num-1)

else

return num

Ans : recursive function

14 Differentiate parameters and arguments.

Parameters are the variables in a function definition and arguments are the values which are passed to a function definition.

15 Give an example of function definition parameter without type.

(requires: b>=0)

(returns: a to the power of b)

let rec pow a b:=

if b=0 then 1

else a * pow a (b-1)

16 Give an example of function definition parameter with type.

(requires: b> 0)

(returns: a to the power of b)

let rec pow (a: int) (b: int) : int :=

if b=0 then 1

else a * pow b (a-1)

17 Give an example of pure function.

let square x
return: x * x
let i: = 0;
if i <strlen (s) then
-- Do something which doesn't affect s
++i

18 Give an example of impure function.

let Random number
let a := random()
if a > 10 then
return: a
else
return: 10

PART C

1 Write a note on Function specification.

Let us consider the example a:= (24). a:= (24) has an expression in it but (24) is not itself an expression. Rather, it is a function definition. Definitions bind values to names, in this case the value 24 being bound to the name 'a'. Definitions are not expressions, at the same time expressions are also not treated as definitions. Definitions are distinct syntactic blocks. Definitions can have expressions nested inside them, and vice-versa.

2 Write an algorithm check whether the entered number is even or odd.

(requires: x>= 0)
let rec even x :=
x=0 || odd (x-1)

```
return 'even'
(requires: x>= 0)
let odd x :=
x<>0 && even (x-1)
return 'odd'
```

3 Mention the characteristics of Interface.

- The class template specifies the interfaces to enable an object to be created and operated properly.
- An object's attributes and behaviour is controlled by sending functions to the object.

4 Why strlen is called pure function?

- Pure functions are functions which will give exact result when the same arguments are passed.
- strlen is a pure function because the function takes one variable as a parameter, and accesses it to find its length.
- This function reads external memory but does not change it, and the value returned derives from the external memory accessed.

5 What is the side effect of impure function. Give example.

- A function has side effects when it has observable interaction with the outside world.
- Modifying the variable outside of function causes side effect.
- For example

```
let y: = 0
(int) inc (int) x
y: = y + x;
return (y)
```

- In the above example the value of 'y' get changed inside the function definition due to which the result will change each time.
- The side effect of the inc( ) function is, it is changing the data of the external visible variable 'y'.

6 Differentiate pure and impure function.

Pure function:

- The return value of the pure functions solely depends on its arguments passed. Hence, if you call the pure functions with the same set of arguments, you will always get the same return values.
- They do not have any side effects.
- They do not modify the arguments which are passed to them

Impure function:

- The return value of the impure functions does not solely depend on its arguments passed. Hence, if you call the impure functions with the same set of arguments, you might get the different return values.
- For example, random(), Date().
- They may modify the arguments which are passed to them.

7 What happens if you modify a variable outside the function? Give an example.

- Modifying the variable outside of function causes side effect.
- For example

```
let y: = 0
(int) inc (int) x
y: = y + x;
return (y)
```

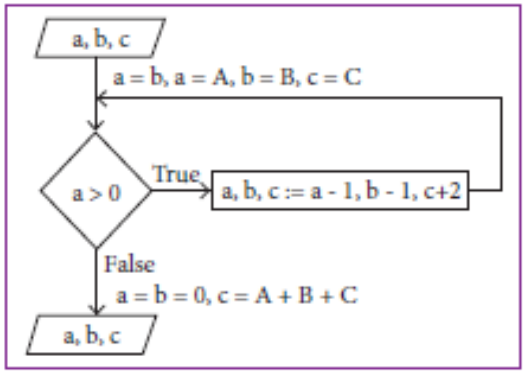
- In the above example the value of 'y' get changed inside the function definition due to which the result will change each time.
- The side effect of the inc( ) function is, it is changing the data of the external visible variable 'y'.

8 Write an algorithm and draw flowchart for Chameleons of Chromeland problem.

Algorithm:
monochromatize (a, b, c)

```
-- inputs : a = A, b=B, c=C, a=b
-- outputs : a = b = 0, c = A+B+C
while a>0
        a, b, c := a-1, b-1, c+2
```

Flowchart:



9 Write a short note an syntax for function types.

$x \rightarrow y$

$x1 \rightarrow x2 \rightarrow y$

$x1 \rightarrow ... \rightarrow xn \rightarrow y$

The 'x' and 'y' are variables indicating types. The type $x \rightarrow y$ is the type of a function that gets an input of type 'x' and returns an output of type 'y'. Whereas $x1 \rightarrow x2 \rightarrow y$ is a type of a function that takes two inputs, the first input is of type 'x1' and the second input of type 'x2', and returns an output of type 'y'. Likewise $x1 \rightarrow \ldots \rightarrow xn \rightarrow y$ has type 'x' as input of n arguments and 'y' type as output.

PART D

1. What are called Parameters and write a note on

(i) Parameter without Type

(ii) Parameter with Type

Parameters:

Parameters are the variables in a function definition and arguments are the values which are passed to a function definition.

Parameter without Type:

- Consider the following function definition:

```
(requires: b>=0 )
(returns: a to the power of b)
let rec pow a b:=
if b=0 then 1
else a * pow a (b-1)
```

- In the above function definition variable 'b' is the parameter and the value which is passed to the variable 'b' is the argument.
- The precondition (requires) and post condition (returns) of the function is given.
- We have not mentioned any types: (data types). This is called parameter without type.

Parameter with Type:

- Consider the following function definition:

```
(requires: b> 0 )
(returns: a to the power of b )
```

```
let rec pow (a: int) (b: int) : int :=
if b=0 then 1
else a * pow b (a-1)
```

- In the above function definition variable 'b' is the parameter and the value which is passed to the variable 'b' is the argument.
- All the arguments and return value also mentioned with type of data(int).
- When we write the type annotations for 'a' and 'b' the parentheses are mandatory. This is called parameter with type.

2. Identify in the following program

```
let rec gcd a b :=
if b <> 0 then gcd b (a mod b) else return a
```

i) Name of the function

Ans : gcd

ii) Identify the statement which tells it is a recursive function

Ans : let rec gcd

iii) Name of the argument variable

Ans : a,b

iv) Statement which invoke the function recursively

Ans : gcd b (a mod b)

v) Statement which terminates the recursion

Ans : return a

3. Explain with example Pure functions.

- Pure functions are functions which will give exact result when the same arguments are passed. For example the mathematical function sin (0) always results 0. This means that every time you call the function with the same arguments, you will always get the same result.
- A function can be a pure function provided it should not have any external variable which will alter the behaviour of that variable.
- Let us see an example

```
let square x
return: x * x
let i: = 0;
if i <strlen (s) then
-- Do something which doesn't affect s
++i
```

The above function square is a pure function because it will not give different results for same input.

4. Explain with example impure functions.

- The variables used inside the function may cause side effects though the functions which are not passed with any arguments. In such cases the function is called impure function.
- When a function depends on variables or functions outside of its definition block, you can never be sure that the function will behave the same every time it's called.
- For example the mathematical function random() will give different outputs for the same function call.

```
let Random number
let a := random()
if a > 10 then
return: a
else
```

return: 10

Here the function Random is impure as it is not sure what will be the result when we call the function.

5. Explain with an example interface and implementation.

- An interface is a set of action that an object can do. For example when you press a light switch, the light goes on, you may not have cared how it splashed the light.
- In Object Oriented Programming language, an Interface is a description of all functions that a class must have in order to be a new interface.
- In our example, anything that **"ACTS LIKE"** a light, should have function definitions like turn_on () and a turn_off (). The purpose of interfaces is to allow the computer to enforce the properties of the class of **TYPE T** (whatever the interface is) must have functions called X, Y, Z, etc.
- A class declaration combines the external interface (its local state) with an implementation of that interface (the code that carries out the behaviour).
- An object is an instance created from the class.
- The interface defines an object's visibility to the outside world.
- The difference between interface and implementation is

Interface:

Interface just defines what an object can do, but won't actually do it.

Implementation:

Implementation carries out the instructions defined in the interface.

- In object oriented programs classes are the interface and how the object is processed and executed is the implementation.

CHAPTER 2
DATA ABSTRACTION
PART A

CHOOSE THE BEST ANSWER:

1. _____ are the representation for Abstract Data types.
   a) Objects b) Lists c) Classes d) Functions
2. Which of the following extract the information of the object?
   a) Destructors b) Selectors c) Constructors d) Functions
3. Which of the following is and incorrect statement?
   (i) ADT is defined by set of values and set of operations
   (ii) ADT does specify how data will be organized in the memory.
   (iii) Constructors are not used to built abstract data type.
   (iv) Selectors are functions that retrieve information from the data type.
   a) i, ii b) i, iii, iv c) ii, iv d) ii, iii
4. Pick the odd one out.
   a) List b) Constructor c) Pair d) Tuple
5. To facilitate data abstraction, How many types of functions are created?
   a) 4 b) 3 c) 2 d) Only one
6. Which of the following is a compound structure?
   a) Pair b) Triplet c) single d) quadrat
7. Which of the following gives an implementation independent view?
   a) Behavior of an object b) Datatype c) Abstract d) Concrete
8. Which of the following are implemented using & lists?
   a) Singly linked list ADT b) Doubly Linked list ADT c)Stack ADT d) Queue ADT e) All of these
9. Which of the following is a comma separated values surrounded with parentheses?
   a) List b) Dictionary c) Set d) Tuple
10. Which of the following function that facilitate the data abstraction?
    a) Constructors b) Destructors c) Selectors d) a and c
11. ADT behavior is defined by
    (i) Set of Variables (ii) Set of Value

(iii) Set of Functions (iv) Set of Operations
a) i, iii b) ii, iv c) i, ii d) ii, iii

12. Which of the following functions that retrieve information from the data type?
a) Constructors b) Selectors c) recursive d) Nested

13. Which of the following is constructed by placing expressions within square brackets?
a) Tuples b) Lists c) Classes d) quadrats

14. How many objects can be created from a class?
a) 0 b) 1 c) 2 d) many

15. Which of the following extract the information of the object?
a) Function b) Selectors c) Constructors d) Destructors

16. Which data representation, a definition for each function is known?
a) Concrete b) Abstract c) User defined d) Built in

17. Which of the following provides modularity?
a) Function b) Class c) Object d) Variable

18. Which of the following is a type for objects whose behavior is defined by a set of value and a set of operations?
a) User-defined datatype b) Built-in datatype c) Abstract datatype d) Derived datatype

19. A _____ data representation is defined as an independent part of the program.
a) Tuple b) Abstract c) List d) Concrete

20. Color = ('red' 'green' 'blue') is an example of
a) Dictionary b) Tuple c) List d) Set

21. Choose the correct statement
a) The class construct defines the form for multipart objects that represent a Person.
b) Constructors are functions that build the concrete data type.
c) Selectors are functions that build the data.
d) ADT (Abstract Data Type) does specify how data will be organised in Memory.

22. A _____ is not just data, it has functions defined within it.
a) Class b) Object c) List d) Pair

23. Match the following

(i) Contructors	-	A .Comma separated
(ii) Selectors	-	B. Square brackets
(iii) List	-	C.Extract individual
(iv) Tuple	-	D. Bundling together

a) (i) - D, (ii) - A, (iii) - B, (iv) - C b) (i)- D, (ii)- C,(iii)- B, (iv) - A
c) (i) - B, (ii) - C, (iii) - D, (iv) - A d) (i) - B, (ii) - D, (iii) - A, (iv) - C

24. In which data representation, a definition for each function is known.
a) User defined b) Concrete c) Buil-in d) Abstract

25. Assertion (A): The basic idea of abstraction is to structure program.
Reason (R): Abstract Data Type is a type for objects whose behaviour is defined by a set of value and a set of operations.
a) Both A and R are True and R is the correct explanation for A
b) Both A and R are True but R is not the correct explanation for A
c) A is True, but R is False d) A is False, but R is True

26. Identify the constructor from the following.
a) city = makecity (name, lat, lon) b) getname(city) c) getlat(city) d) getlon(city)

27. How many parts are there in the program?
a) 3 b) 2 c) 4 d) Many

28. Tuple is constructed by using _____ and _____.
a) ( ),: b) [ ],: c) [ ], d) ( ),

29. Which of the following are functions that build the abstract datatype?
a) Destructors b) Selectors c) Constructors d) All of these

30. Choose the incorrect Pair
a) ADT - Abstract Data Type b) Classes – Structures
c) Abstraction - Modularity d) List - Immutable

31. Bundling two values together into one can be considered as

a) Pair b) Triplet c) single d) quadrat

32. Which of the following does not allow us to name the various parts of a multi-item object?
a) List b) Tuple c) Pair d) All of these

33. The process of providing only the essentials and hiding the details is known as
a) Pairs b) Functions c) Encapsulation d) Abstraction

34. In list lst[(0,10), (1,20)] - 0 and 1 represents _____.
a) value b) Index c) list identifier d) Tuple

35. 1: = [10, 20] is an example
a) Tuple b) Dictionary c) Set d) List

36. Classes are the representation for _____ .
a) Built-in datatype b) Concrete datatype c) Abstract datatype d) Essential datatype

37. Linked list are of _____.
a) single b) double c) multiple d) both a and b

38. The data type whose representation is known are called
a) Built in datatype b) Derived datatype c) Concrete datatype d) Abstract datatype

39. Choose the incorrect statement.
a) Python provides a compound structure called Pair.
b) A tuple is a semicolon(;) separated sequence of values surrounded with Parantheses.
c) List is constructed by placing expressions within square brackets.
d) The elements of a list can be accessed in two ways.

40. Match the following
(i) Compound Structure - A .Pair
(ii) Bundling two values - B. Function
(iii) Multi-item object - C.pair
(iv) Constructors - D. Classes
a) (i)- A, (ii)- C, (iii) - D, (iv) - B b) (i)- A, (ii) - D, (iii) - B, (iv) - C
c) (i)- D, (ii)- B, (iii) - C, (iv) - A d) (i) - D, (ii) - C, (iii) - A, (iv) - B

41. List is constructed by using _____ and _____ .
a) ( ),, b) [ ],: c) [ ],, d) < >, ;

42. Choose the correct Pair
a) Constructors - Retrieve data b) Selectors - Build the data
c) Pair - Compound structure d) Classes - Single-item object

43. nums[0] represent that you are accessing _____ element.
a) 0 b) 1 c) 2 d) 3

44. Expand ADT.
a) Abstract Data Type b) Add Data Type c) Application Data Type d) Absolute Data Type

45. Which of the following replicate how we think about the world?
a) Data Hiding b) Data Abstraction c) Queue ADT d) Stack ADT

46. To implement the concrete level of data abstraction the language python provides a compound structure called
a) User defined function b) ADT c) Concrete data d) Pair

47. The process of providing only the essentials and hiding the details is known as _____.
a) modularity b) structure c) Tuple d) abstraction

48. List can be called as.
a) Tuple b) List c) Set d) Pairs

49. How many values can be stared in the list?
a) 100 b) Multiple c) 4 d) 10

50. How many ways of representing pair data type are there?
a) 1 b) 2 c) 3 d) 4

51. Which of the following defines a data abstraction by grouping related data items?
a) Tuple b) Class c) List d) Pair

52. The Splitting of program into many modules are called as _____.
a) modularity b) structures c) classes d) list

53. Which of the following is a powerful concept that allows programmers to treat codes as objects?
a) Data Abstraction b) Encapsulation c) Polymorphism d) Inheritance

54. Which of the following as bundled data and the functions that work on that data?
a) Object b) Class c) List d) Pair
55. _____ are the representation for ADT.
a) List b) classes c) Int d) Float
56. The data type whose representation is unknown are called
a) Built in datatype b) Derived datatype c) Concrete datatype d) Abstract datatype
57. Which data representation is defined as an independent part of the program?
a) Abstract b) Concrete c) Tuple d) List
58. Which of the following representation for Abstract Data Types?
a) Classes b) Tuples c) Lists d) Pairs
59. Which of the following is contracted by placing expressions within square brackets separated by commas?
a) Dictionary b) List c) Tuple d) Set
60. Data Abstraction allows programmers to treat code as _____ .
a) Parameters b) Members c) Objects d) Classes
61. _____ is made up of list or Tuples.
a) Pair b) Dictionary c) Set d) Control Structures
62. ADT expansion is
a) Absolute Data Type b) Abstract Data Type
c) Application Development Tool d) Abstract Data Template
63. List can also be called as
a) Pairs b) Functions c) Class d) Structure
64. How many types of functions are needed to facilitate abstraction?
a) 1 b) 2 c) 3 d) 4
65. The _____ can be implemented using singly linked list or doubly linked list.
a) Tuple ADT b) List ADT c) Function ADT d) None of these
66. ADT stands for _____.
a) Advanced Data Typing b) Application Developing Tool
c) Abstract data types d) Advanced data types
67. CDT expansion is
a) Central Data Type b) Collective Data Type c) Concrete Data Type d) Class Data Type
68. A _____ is a comma separated values surround with parentheses.
a) List b) Dictionary c) Tuple d) Set
69. Which is contracted by placing expressions within square brackets separated by comma?
a) Tuple b) List c) Dictionary d) Set
70. Which of the following provides modularity?
a) Datatypes b) Abstraction c) Classes d) Objects
71. How many ways to implement an ADT?
a) Only one b) Many c) Two d) Three
72. := is called as _____.
a) assigned as b) becomes c) both a and b d) none of these
73. Which of the following allow to name the various parts of a multi-item object?
a) Tuples b) Lists c) Classes d) quadrats
74. How many ways are there to represent pair datatype?
a) 4 b) 5 c) 2 d) 3
75. Which of the following are functions that build the abstract data type?
a) Function b) Selectors c) Constructors d) Destructors

ANSWERS

1. c) Classes 2. b) Selectors 3. d) ii, iii 4. b) Constructor 5. c) 2 6. a) Pair 7. c) Abstract 8. e) All of these 9. d) Tuple 10. d) a and c 11. b) ii, iv 12. b) Selectors 13. b) Lists 14. d) many 15. c) Constructors 16. a) Concrete 17. c) Object 18. c) Abstract datatype 19. d) Concrete 20. b) Tuple 21. a) The class construct defines the form for multi-part objects that represent a Person. 22. a) Class 23. b) (i)- D, (ii)- C, (iii)- B, (iv) - A 24. b) Concrete 25. a) Both A and R are True and R is the correct explanation for A	26. a) city = makecity (name, lat, lon) 27. b) 2 28. d) ( ), 29. c) Constructors 30. d) List - Immutable 31. a) Pair 32. d) All of these 33. d) Abstraction 34. b) Index 35. d) List 36. c) Abstract datatype 37. d) both a and b 38. b) Derived datatype 39. b) A tuple is a semicolon(;) separated sequence of values surrounded with Parantheses. 40. a) (i)- A, (ii)- C, (iii) - D, (iv) - B 41. c) [ ],, 42. c) Pair - Compound structure 43. b) 1 44. a) Abstract Data Type 45. b) Data Abstraction 46. d) Pair 47. d) abstraction 48. d) Pairs 49. b) Multiple 50. b) 2	51. b) Class 52. a) modularity 53. a) Data Abstraction 54. b) Class 55. b) classes 56. c) Concrete datatype 57. b) Concrete 58. a) Classes 59. b) List 60. c) Objects 61. a) Pair 62. b) Abstract Data Type 63. a) Pairs 64. b) 2 65. b) List ADT 66. c) Abstract data types 67. d) Class Data Type 68. c) Tuple 69. b) List 70. d) Objects 71. b) Many 72. c) both a and b 73. c) Classes 74. c) 2 75. c) Constructors

PART B

1 What is abstract data type?

- Abstract Data type (ADT) is a type (or class) for objects whose behavior is defined by a set of value and a set of operations.
- The definition of ADT only mentions what operations are to be performed but not how these operations will be implemented.
- ADT does not specify how data will be organized in memory and what algorithms will be used for implementing the operations

2 What do you mean by abstraction?

The process of providing only the essentials and hiding the details is known as abstraction.

3 How will you faciliate the data abstraction?

To facilitate data abstraction, we need to create two types of functions. They are constructors and selectors.

4 Differentiate constructors and selectors.

Constructors are functions that build the abstract data type. Selectors are functions that retrieve information from the data type.

5 What are the parts of a program?

Any program consists of two parts. The two parts of a program are, the part that operates on abstract data and the part that defines a concrete representation.

6 Write ADT for rational numbers.

An ADT for rational numbers:
- - constructor
- - constructs a rational number with numerator n, denominator d
rational(n, d)
- - selector
numer(x) → returns the numerator of rational number x
denom(y) → returns the denominator of rational number y

7 Write psudocode for rational number as pair.

Psudocode:

```
x,y:=8,3
rational(n,d)
numer(x)/numer(y)
--output:
```

8 Define wishful thinking.

Wishful Thinking is the formation of beliefs and making decisions according to what might be pleasing to imagine instead of by appealing to reality.

9 What is a Pair? Give an example.

- Any way of bundling two values together into one can be considered as a pair.
- Lists are a common method to do so. Therefore List can be called as Pairs.
- Example : List = [10, 20].

10 What is a List? Give an example.

- List is constructed by placing expressions within square brackets separated by commas. Such an expression is called a list literal.
- List can store multiple values.
- Each value can be of any type and can even be another list.
- Example : lst := [10, 20]

```
x,y := lst
```

11 What is a Tuple? Give an example.

- A tuple is a comma-separated sequence of values surrounded with parentheses.
- Tuple is similar to a list.
- The difference between the two is that you cannot change the elements of a tuple once it is assigned whereas in a list, elements can be changed.
- Example: colour= (‘red’, ‘blue’, ‘Green’)

12 Give an example of implementing an ADT.

- There can be different ways to implement an ADT, for example, the List ADT can be implemented using singly linked list or doubly linked list.
- Similarly, stack ADT and Queue ADT can be implemented using lists.

13 How the concrete level of data abstraction implemented?

- To implement the concrete level of data abstraction, languages like Python provides a compound structure called pair which is made up of list or tuple.
- The first way to implement pairs is with list construct.

14 Write a pseudocode to depressant rational numbers using list.

```
rational(n, d):
return [n, d]
numer(x):
return x[0]
denom(x):
return x[1]
```

15 How a class defines a data abstraction?

- A class defines a data abstraction by grouping related data items. A class is not just data, it has functions defined within it.
- We say such functions are subordinate to the class because their job is to do things with the data of the class.

16 From the statement P1:=Preson( ), What does P1 and person referred..

Person is referred to as a class or a type, while p1 is referred to as an object or an instance.

17 How the elements of a list can be accessed?

The elements of a list can be accessed in two ways. The first way is via multiple assignment and the second method is by the element selection operator .

PART C

1 Differentiate Concrete data type and abstract datatype.

Concrete data type

- In concrete data representation, a definition for each function is known.
- Concrete data types or structures are direct implementations of a relatively simple concept.

abstract datatype.

- ADT only mentions what operations are to be performed but not how these operations will be implemented.
- ADT does not specify how data will be organized in memory and what algorithms will be used for implementing the operations
- ADT offer a high level view of a concept independent of its implementation.

2. Which strategy is used for program designing? Define that Strategy.

'Wishful Thinking' strategy is used for program designing.

Definition:

Wishful Thinking is the formation of beliefs and making decisions according to what might be pleasing to imagine instead of by appealing to reality.

3. Identify which of the following are constructors and selectors?

a) N1=number() b) acceptnum(n1) c) displaynum(n1) d) eval(a/b)
e) x,y= makeslope (m), makeslope(n)
f) display()

ANSWERS

a. Constructor b. Selector c. Selector d. Constructor e. Constructor f. Selector

4. What are the different ways to access the elements of a list? Give example.

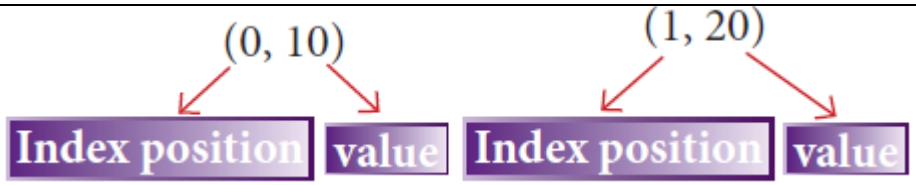
- List is constructed by placing expressions within square brackets separated by commas. Example for List is [10, 20].
- The elements of a list can be accessed in two ways. The first way is via our familiar method of multiple assignment, which unpacks a list into its elements and binds each element to a different name.

  lst := [10, 20]
  x, y := lst
  In the above example x will become10 and y will become 20.
- A second method for accessing the elements in a list is by the element selection operator, also expressed using square brackets. Unlike a list literal, a square-brackets expression directly following another expression does not evaluate to a list value, but instead selects an element from the value of the preceding expression.

lst[0]
10
lst[1]
20

In both the example mentioned above mathematically we can represent list similar to a set.

lst[(0, 10), (1, 20)] – where



5 Identify Which of the following are List, Tuple and class?

a) arr [1, 2, 34]
b) arr (1, 2, 34)
c) student [rno, name, mark]
d) day= ('sun', 'mon', 'tue', 'wed')
e) x= [2, 5, 6.5, [5, 6], 8.2]
f) employee [eno, ename, esal, eaddress]
ANSWERS
a. List b. Tuple c. Class d. Tuple e. List f. Class

6 Identify which of the following are constructors and selectors?

(i) City=Make city (name,lat,lon)
(ii) Get name (city)
(iii) Make point (x,y)
(iv) x coord (point)
(v) y coord (point)

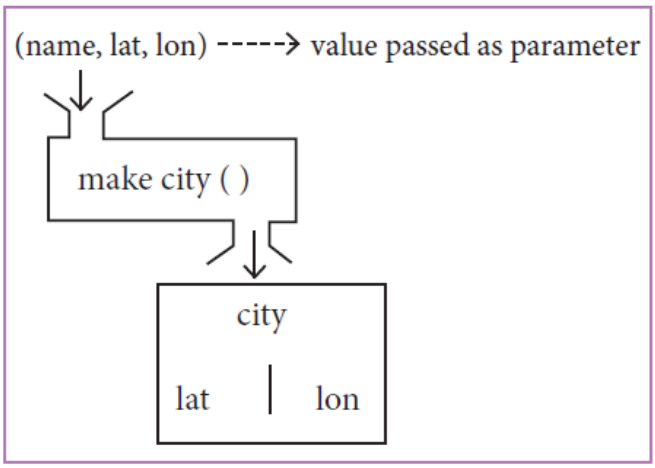
(i) constructor (ii) selector (iii) constructor (iv) selector (v) selector

PART D

1. How will you facilitate data abstraction? Explain it with suitable example.

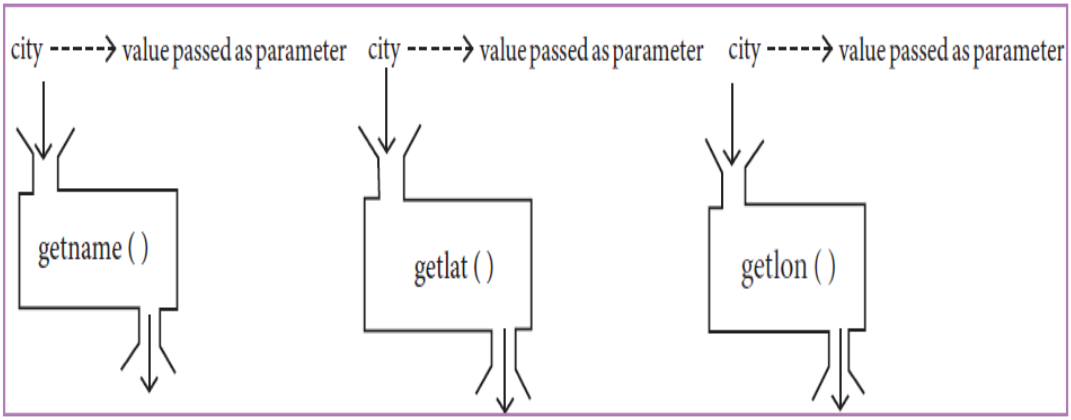
- To facilitate data abstraction, we need to create two types of functions: constructors and selectors. Constructors are functions that build the abstract data type.
  Selectors are functions that retrieve information from the data type.
- For example, we have an abstract data type called city. This city object will hold the city's name, and its latitude and longitude. To create a city object, we use a function like
  city = makecity (name, lat, lon)
- To extract the information of a city object, you would use functions like
  - getname(city)
  - getlat(city)
  - getlon(city)

  Here makecity (name, lat, lon) is the constructor which creates the object city.



- Selectors are nothing but the functions that retrieve information from the data type. Therefore in the above code
  - getname(city)
  - getlat(city)
  - getlon(city)

  are the selectors because these functions extract the information of the city object



2. What is a List? Why List can be called as Pairs? Explain with suitable example. What is a List? Give an example.

- List is constructed by placing expressions within square brackets separated by commas. Such an
- expression is called a list literal.
- List can store multiple values.
- Each value can be of any type and can even be another list.

Example for List is [10, 20].

- Any way of bundling two values together into one can be considered as a pair. Lists are a common method to do so. Therefore List can be called as Pairs.
- The elements of a list can be accessed in two ways.
- The first way is via our familiar method of multiple assignments.

  Example:

  lst := [10, 20]

  x, y := lst

  In the above example x will become10 and y will become 20.
- A second method for accessing the elements in a list is by the element selection operator, also expressed using square brackets.
- Example:

  lst[0]

  10

  lst[1]

  20

Representing Rational Numbers Using List :

We can represent a rational number as a pair of two integers in pseudo code: a numerator and a denominator.

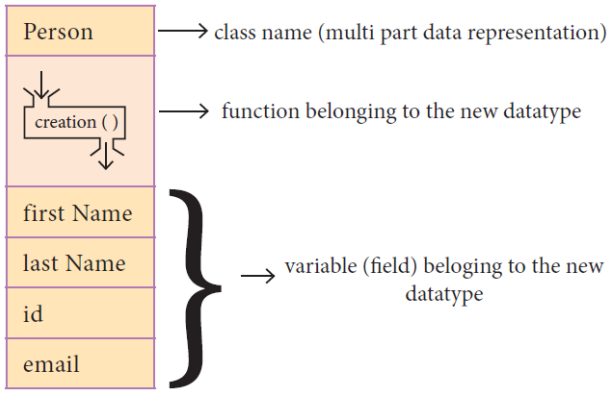
rational(n, d):

```
return [n, d]
numer(x):
return x[0]
denom(x):
return x[1]
```

3. How will you access the multi-item? Explain with example.

- The structure construct (In OOP languages it's called class construct) to represent multi-part objects where each part is named (given a name). Consider the following pseudo code:

```
class Person:
    creation( )
    firstName := " "
    lastName := " "
    id := " "
    email := " "
```



The new data type Person is pictorially represented as

- The class (structure) construct defines the form for multi-part objects that represent a person. Its definition adds a new data type, in this case a type named Person.
- Once defined, we can create new variables (instances) of the type. In this example Person is referred to as a class or a type, while p1 is referred to as an object or an instance.

CHAPTER 3
SCOPING
PART A

CHOOSE THE BEST ANSWER:

1. Choose the correct pair.
   a) Namespaces - Mapping names b) LEGB - Variable rule
   c) Function - Output d) Scope - Language
2. Normally every variable defined in a program has.
   a) Global scope b) Local scope c) Enclosed scope d) Built-in scope
3. How many types of variable scopes are there?
   a) 1 b) 2 c) 3 d) 4
4. How many variables can be mapped to the same instance?
   a) Multiple b) 3 c) 4 d) 2
5. Assertion (A): Private members of a class are accessible from the outside the class.

Reason (R): It can be handled only from outside the class.
a) A and R are True and R is the correct explanation for A.
b) A is True but R is False.
c) A is False but R is True. d) Both A and R are False.

6. The duration for which a variable is alive is called its _____ .
a) End time b) Scope c) Life time d) Visible time

7. Choose the type of scope for a variable 'a' defined in the following program.
```
Disp ( ) :
a : = 7
Print a
Disp ( )
```
a) Built-in b) Local c) Global d) Enclosed

8. Which of the following contain Instructions processing logic and data?
a) Modules b) Scope c) Variable d) Identifier

9. How many access control keywords are there?
a) 2 b) 3 c) 4 d) 5

10. The scope of a _____ is that part of the code where it is visible.
a) Keyword b) Operator c) Function d) Variable

11. A single _____ can contain one or several statements closely related to each other.

12. In Object Oriented Programming Language security is implanted through _____
a) Access modifiers b) Access modules c) Access variables d) Keywords

13. The example of modules are
a) Procedures b) Subroutines c) Functions d) All of these

14. _____ is a selective restriction of access to data in a program?
a) Access control b) System authentication c) Control variable d) Modules

15. How many type of scope variables available in python language?
a) 2 b) 3 c) 4 d) 5

16. Which sign is used in programming languages to map the variable and object?
a) + b) — c) := d) 1

17. _____ also defines the order in which variables have to be mapped to the object in order to obtain the value.
a) Scope b) Local c) event d) object

18. _____ members of the class are accessible from outside the class.
a) Private b) Public c) Protected d) All of these

19. Choose the correct statement from the following.
(i) A Program cannot be divided into modules that work together to get the output.
(ii) Modules can be separately compiled and stored in a library.
(iii) Procedure, subroutines and functions are not examples of modules.
(iv) Modules contain instructions, logic and data
a) i and ii b) ii and iv c) ii and iii d) iii and iv

20. Fill up the blank in assign a variable with _____ to an object.
a) = b) ! = c) : = d) None of these

21. Which of the following contain instructions, processing logic and data?
a) Scopes b) Access control c) Modules d) Indentation

22. A variable which is declared outside all the functions in a program is known as
a) Extern b) Global c) Local d) Enclosed

23. Which of the following refers to the addresses to an object in memory?
a) Operators b) Functions c) Variables d) Indentation

24. Which of the following is not a classical object oriented language?
a) C++ b) C c) Java d) Python

25. Programs are composed of one or more independently developed
a) Access control b) Members of a class c) Encapsulation d) Modules

26. Match the following
(i) Access control - A .Outside the class
(ii) Public Memmbers - B. Within the class

(iii) Private Members - C. Security technique
(iv) Protected Members - D. Denied outside the class
a) (i) - C, (i) - A, (iii) - D, (iv). - B b) (i) - C, (h) - B, (iii) - D, (iv) - A
c) (i) - B, (h) - D, (iii) - C, (iv) - A d) (i) - B, (ii) - C, (iii) - A, (iv) - D

27. A function will first look up for a variable name in its _____ scope.
a) local b) Enclosed c) Global d) Built-in

28. The following are the type of variable scopes Find the odd one out
a) Local b) Protected c) Enclosed d) Global

29. Which part of a program that can see or use as variable?
a) function b) scope c) Indentation d) Identifier

30. The order in which variables have to be mapped to the object in order to obtain the value is called
a) Syntax b) Hierarchy c) Scope d) Rule

31. Variables of built-in scopes are loaded as _____ files.
a) exe b) linker c) object d) library

32. Match the following
(i) Local - A .Nested
(ii) Enclosed - B. modules
(iii) Global - C. Inside
(iv) Bulitin - D. Uppermost
a) (i) - B, (ii) - C, (iii) - A, (iv) - D b) (i) - c, (ii)- A, (iii) - D, (iv) - B
c) (i) - B, (ii) - A, (iii) - D, (iv) - C d) (i) - c, (ii)- D, (iii) - B, (iv) - A

33. The duration for which a variable is alive is called its _____.
a) scale b) life time c) static d) function

34. Pick the odd one out.
a) C++ b) Java c) Python d) Module

35. The _____ rule is used to decide the order in which the scopes are to be searched for scope resolution.

36. Which of the following members of a class are denied access from outside the class?
a) Enclosed b) Public c) Private d) Protected

37. How the names are mapped with objects in programming language?
a) name = = object b) object : = name c) name :: object d) name := object

38. A variable which is declared outside of all the functions in a program is known as _____ variable.
a) L b) G c) E d) B

39. Which of the following keeps track of all these mappings with namespaces?
a) My SQL b) System software c) Programming languages d) Application software

40. Choose the correct statement.
a) C++ is a function b) A default members in a python class are public
c) Python prescribes a suffixing the name of the variable
d) A default members in a C++ members are public

41. Identify which is not a variable scope.
a) module b) built-in c) enclosed d) pointer

42. What is the output of the statement in the following program?
X : = 10
Disp ( ):
a : = 7
print a
Displ ( ) :
Print a
a) 107 b) 10 c) 710 d) 7

43. A _____ variable can be accessed inside or outside of all the functions in a program.
a) local b) global c) enclosed d) built-in

44. Which is true about modular programming?
a) single procedure can be reused b) single procedure cannot be reused
c) none of these

45. The arrangement of private instance variables and public methods ensures the principle of

a) Inheritance b) Abstraction c) Polymorphism d) Encapsulation

46. Assertion (A): Protected members of a class are accessible from within the class.
Reason (R):They can be handled only from outside the class.
a) A and R are True and R is the correctexplanation for A. b) A is True but R is False.
c) A is False but R is True. d) Both A and R are False.

47. Which of the following refers in the addresses to an object in memory?
a) Functions b) Scope c) Indentation d) Identifier

48. Which of the following is not a variable scope?
a) Global b) Enclosed c) Built-in d) List

49. A function defined within another function is called _____ function.
a) member b) looping c) nested d) Invariant

50. Identify which is not a module?
a) Algorithm b) procedures c) subroutines d) functions

51. How many types of variable scope are there?
a) 6 b) 2 c) 4 d) 3

52. Which of the following can ease the job of programming and debugging the program?
a) Statements b) Scopes c) Interaction d) Modules

53. Pick the odd one out.
a) Procedures b) Scope c) Subroutines d) Functions

54. Write the output (value stored in b).
a:=5
b:=a
a) 0 b) 3 c) 5 d) 2

55. Which of the following rule is used to decide the order in which the scopes are to be searched for scope resolution?
a) LGBE b) LEGB c) LGEB d) LBEG

56. Find the odd man out
a) Public b) Private c) Local d) Protected

57. Choose the incorrect statement.
a) Modules can be separately compiled b) Modules can be used by other modules
c) Modules are not easy to understand d) Errors can easily be identified in modules

58. Write the below interns of hierarchy (highest to lowest)?
(1) Reversed names in built in functions
(2) Defined inside function
(3) Defined inside enclosing function?
(4) Defined at the uppermost level
a) 2, 3, 4, 1 b) 3, 2, 1, 4 c) 1, 4, 2, 3 d) 2, 3, 1, 4

59. A Function always first look up for a variable name in its _____ scope.
a) Local b) Enclosed c) Global d) Built-in

60. Which of the following members of a class are accessible from within the class and available to its subclass?
a) Private b) Public c) Protected d) All of these

61. Which type of variable declared outside the functions in a program?
a) Local b) Global c) private d) Enclosed

62. Built-in scopes are called as _____ scope.

63. Which is a python class members?
a) Public b) Private c) Global d) Protected

64. The scope of nested function is _____ scope.
a) local b) global c) enclosed d) built-in

65. Scope refers to the visibility of _____
a) Variables b) Parameters c) Functions d) All of these

66. Which of the following is not a module?
a) Indentation b) Procedure c) Subroutines d) function

67. Find the value of a.
a:=5

b:=a
a:=3
a) 0 b) 3 c) 5 d) 2

68. Choose the incorrect pair.
a) Module - Small Program b) Program - Built in scope
c) Software - Packages d) Debugging - Errors

69. Which of the following is does not visibility of scope?
a) Modules b) Variables c) Functions d) Identifiers

70. Assertion (A): A module is a part of a program.
Reason (R): Modules work not perfectly on individual level.
a) A and R are True and R is the correct explanation for A. b) A is True but R is False.
c) A is False but R is True. d) Both A and R are False.

71. The arrangement of private instance variables and public methods ensures the principle of _____.
a) security b) data encapsulation c) Inheritance d) class

72. _____ can be separately compiled and stored in a library.
a) Characteristics b) Modules c) Syntax d) None of these

73. Which is called contain instructions, processing logic and data?
a) Function b) Modules c) Scope d) Indentation

74. By default, the C++ and Java class members are
a) Local b) Public c) Private d) Protected

75. A _____ is a part of a program.
a) code b) module c) flowchart d) system software

ANSWERS

1. a) Namespaces - Mapping names
2. a) Global scope
3. d) 4
4. a) Multiple
5. d) Both A and R are False.
6. c) Life time
7. b) Local
8. a) Modules
9. b) 3
10. d) Variable
11. module
12. a) Access modifiers
13. d) All of these
14. a) Access control
15. c) 4
16. c) :=
17. a) Scope
18. b) Public
19. b) ii and iv
20. d) None of these
21. c) Modules
22. b) Global
23. d) Indentation
24. b) C
25. d) Modules
26. b) (i) - C, (h) - B, (iii) - D, (iv) - A
27. a) local
28. b) Protected
29. b) scope
30. c) Scope
31. d) library
32. b) (i) - c, (ii)- A, (iii) - D, (iv) - B
33. b) life time
34. d) Module
35. LEGB
36. c) Private
37. d) name := object
38. b) G
39. c) Programming languages
40. b) A default members in a python class are public
41. d) pointer
42. b) 10
43. b) global
44. a) single procedure can be reused
45. d) Encapsulation
46. b) A is True but R is False.
47. c) Indentation
48. d) List
49. c) nested
50. a) Algorithm
51. c) 4
52. d) Modules
53. b) Scope
54. c) 5
55. b) LEGB
56. c) Local
57. c) Modules are not easy to understand
57. c) Modules are not easy to understand
58. a) 2, 3, 4, 1
59. a) Local
60. c) Protected
61. b) Global
62. module
63. a) Public
64. c) enclosed
65. d) All of these
66. a) Indentation
67. b) 3
68. b) Program - Built in scope
69. a) Modules
70. b) A is True but R is False.
71. b) data encapsulation
72. b) Modules
73. b) Modules
74. c) Private
75. b) module

PART B

1. What is a scope?

- Scope refers to the visibility of variables, parameters and functions in one part of a program to another part of the same program.
- In other words, which parts of your program can see or use it.

2. Why scope should be used for variable. State the reason.

- To limit a variable's scope to a single definition scope is needed.
- In this way, changes inside the function can't affect the variable on the outside of the function in unexpected ways.

3. What is Mapping?

- The process of binding a variable name with an object is called mapping.
- = (equal to sign) is used in programming languages to map the variable and object.

4. What do you mean by Namespaces?

- Namespaces are containers for mapping names of variables to objects.
- Names are mapped with objects (name: = object) in programming language.
- This allows access to objects by names you choose to assign to them.

5. What do you mean by LEGB rule?

The LEGB rule is used to decide the order in which the scopes are to be searched for scope resolution.

6 What is the output of the following pseudo code?

```
x:= 'outer x variable'
display():
x:= 'inner x variable'
print x
display()
```

OUTPUT:

```
outer x variable
inner x variable
```

7 Define : Modular programming

- The process of subdividing a computer program into separate sub-programs is called Modular programming.
- Modular programming enables programmers to divide up the work and debug pieces of the program independently.

8 Give example for modules.

The examples of modules are procedures, subroutines, and functions.

9 Define : Access control

- Access control is a security technique that regulates who or what can view or use resources in a computing environment.
- It is a fundamental concept in security that minimizes risk to the object.

10 How Python represents the private and protected Access specifiers?

- Python prescribes a convention of prefixing the name of the variable or method with single or double underscore to emulate the behaviour of protected and private access specifiers.
- All members in a Python class are public by default .

11 Define variable.

Variable are addresses to an object in memory.

12 Name the types of variable scope.

- Local scope
- Enclosed scope
- Global scope
- Built-in scope

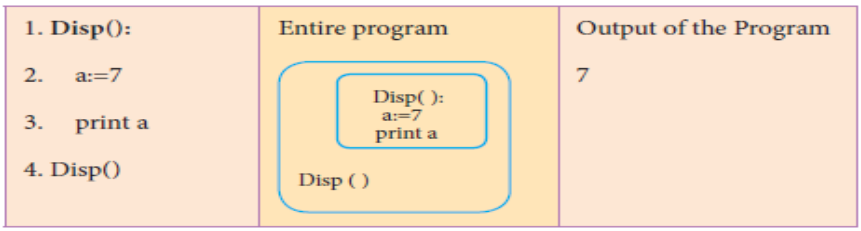
PART C

1. Define Local scope with an example.

Local Scope

- Local scope refers to variables defined in current function.
- A function will first look up for a variable name in its local scope. Only if it does not find it there, the outer scopes are checked.

Example,



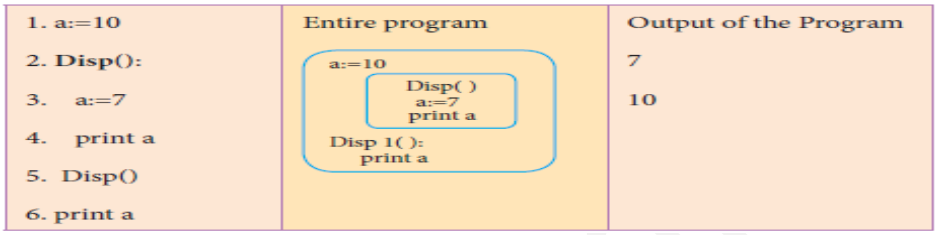
On execution of the above code the variable **a** displays the value 7, because it is defined and available in the local scope.

2 Define Global scope with an example.

Global scope

- A variable which is declared outside of all the functions in a program is known as global variable.
- The global variable can be accessed inside or outside of all the functions in a program.

Example,

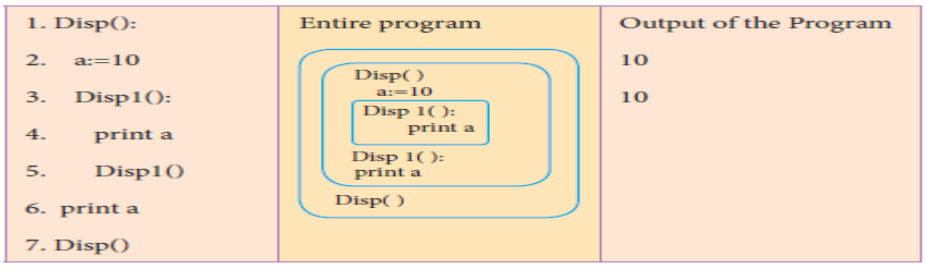


On execution of the above code the variable **a** which is defined inside the function displays the value 7 for the function call Disp() and then it displays 10, because **a** is defined in global scope.

3 Define Enclosed scope with an example.

Enclosed Scope:

- A variable which is declared inside a function which contains another function definition with in it, the inner function can also access the variable of the outer function. This scope is called enclosed scope.
- When a compiler or interpreter search for a variable in a program, it first search Local, and then search Enclosing scopes.

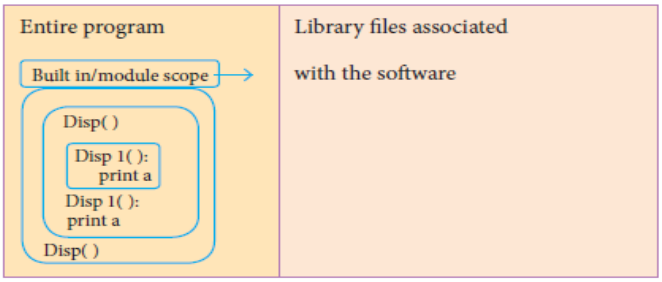


In the above example Disp1() is defined with in Disp(). The variable 'a' defined in Disp() can be even used by Disp1() because it is also a member of Disp().

4 Define Built-in Scope with an example.

Built-in Scope

Finally, we discuss about the widest scope. The built-in scope has all the names that are pre-loaded into the program scope when we start the compiler or interpreter. Any variable or module which is defined in the library functions of a programming language has Built-in or module scope. They are loaded as soon as the library files are imported to the program.



Normally only Functions or modules come along with the software, as packages. Therefore they will come under Built in scope.

5 What are the Characteristics of Modules ?

The following are the desirable characteristics of a module.

- Modules contain instructions, processing logic, and data.
- Modules can be separately compiled and stored in a library.
- Modules can be included in a program.
- Module segments can be used by invoking a name and some parameters.
- Module segments can be used by other modules.

6 Why access control is required?

- Access control is a security technique that regulates who or what can view or use resources in a computing environment.
- It is a fundamental concept in security that minimizes risk to the object. In other words access control is a selective restriction of access to data.
- In object oriented programming languages it is implemented through access modifiers.
- C++ and Java, control the access to class members by public, private and protected keywords.
- Python prescribes a convention of prefixing the name of the variable or method with single or double underscore to emulate the behaviour of protected and private access specifiers.

7 Identify the scope of the variables in the following pseudo code and write its

```
Output:
color:= Red
mycolor():
b:=Blue
myfavcolor():
g:=Green
print color, b, g
myfavcolor()
print color, b
mycolor()
print color
```

Scope of the variables:

Variable	Scope
color	Global
b	Enclosed
g	Local

Output:

```
Red Blue Green
Red Blue
Red
```

8 What do you mean by a module?

- A module is a part of a program. Programs are composed of one or more independently developed modules.
- A single module can contain one or several statements closely related each other.
- Modules work perfectly on individual level and can be integrated with other modules.

9 How Python prescribe private and public access specifiers.

- Python prescribes a convention of prefixing the name of the variable or method with single or double underscore to emulate the behaviour of protected and private access specifiers.
- All members in a Python class are public by default.

10 Write a note on access modifiers of a class.

- Private members of a class are denied access from the outside the class. They can be handled only from within the class
- Public members (generally methods declared in a class) are accessible from outside the class.
- Protected members of a class are accessible from within the class and are also available to its sub-classes.

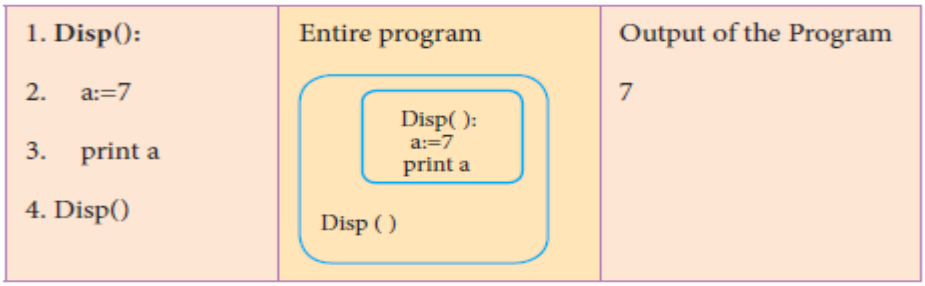
PART D

1 Explain the types of scopes for variable or LEGB rule with example.

Local Scope :

- Local scope refers to variables defined in current function.
- A function will first look up for a variable name in its local scope. Only if it does not find it there, the outer scopes are checked.

Example,



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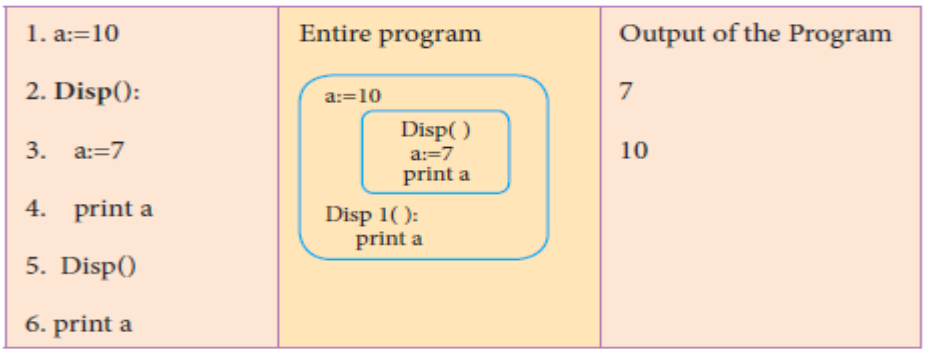
Global scope:

- A variable which is declared outside of all the functions in a program is known as global variable.
- The global variable can be accessed inside or outside of all the functions in a program.

Example,



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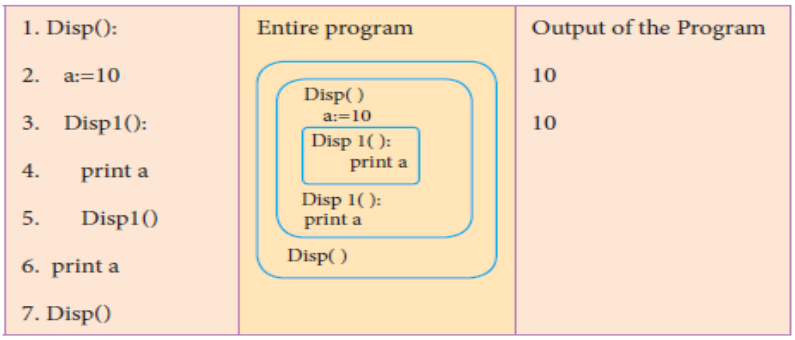
Enclosed Scope:

A variable which is declared inside a function which contains another function definition with in it, the inner function can also access the variable of the outer function. This scope is called enclosed scope.

When a compiler or interpreter search for a variable in a program, it first search Local, and then search Enclosing scopes.



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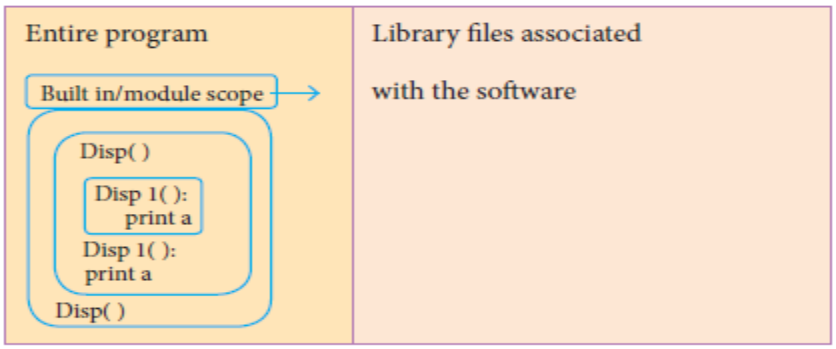
Finally, we discuss about the widest scope. The built-in scope has all the names that are pre-loaded into the program scope when we start the compiler or interpreter. Any variable or module which is defined in the library functions of a programming language has Built-in or module scope. They are loaded as soon as the library files are imported to the program.



Normally only Functions or modules come along with the software, as packages. Therefore they will come under Built in scope.

2 Write any five benefits in using modular programming.

- Less code to be written.
- A single procedure can be developed for reuse, eliminating the need to retype the code many times.
- Programs can be designed more easily because a small team deals with only a small part of the entire code.
- Modular programming allows many programmers to collaborate on the same application.
- The code is stored across multiple files.
- Code is short, simple and easy to understand.
- Errors can easily be identified, as they are localized to a subroutine or function.
- The same code can be used in many applications.
- The scoping of variables can easily be controlled.

3 Explain the concept access control.

- Access control is a security technique that regulates who or what can view or use resources in a computing environment.
- It is a fundamental concept in security that minimizes risk to the object. In other words access control is a selective restriction of access to data.
- In object oriented programming languages it is implemented through access modifiers.
- C++ and Java, control the access to class members by public, private and protected keywords.
- Python prescribes a convention of prefixing the name of the variable or method with single or

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- Private members of a class are denied access from the outside the class. They can be handled only from within the class
- Public members (generally methods declared in a class) are accessible from outside the class.
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- Python prescribes a convention of prefixing the name of the variable or method with single or double underscore to emulate the behaviour of protected and private access specifiers.
- All members in a Python class are public by default.

CHAPTER 4
ALGORITHMIC STRATEGIES
PART A

CHOOSE THE BEST ANSWER:

1. _____ is a step-by-step procedure for solving a given problem.
   a) Algorithm b) Program c) Statements d) Structure
2. Which one is maintained and manipulated effectively through data structures?
   a) Data b) File c) Record d) List
3. An algorithm that yields expected output for a valid input is called an
   a) Algorithmic Solution b) Algorithmic Structure
   c) Algorithmic Strategy d) Algorithmic Procedure
4. Efficiency of an algorithm is defined by the utilization of _____ and _____ complexity.
   a) Time, operation b) Time, space c) Time, latency d) Time, speed
5. Assertion (A): Dynamic programming approach is similar to divide and conquer.
   Reason (R): The given problem is divided into smaller and yet smaller possible sub problems.
   a) Both A and R are correct, and R is the correct explanation for A.
   b) A is True, But R is False.
   c) A is False, But R is True. d) Both A and R are False.
6. Pick the odd one out:
   a) Array b) Structure c) List d) Algorithm
7. Binary search also called
   a) Sequential search b) Half-interval search
   c) Unordered search d) Full-interval search
8. Choose the incorrect statement.
   a) Binary search also called half-interval search algorithm.
   b) The binary search algorithm can be done as divide-and-conquer.
   c) Linear search also called Random search.
   d) List of elements in an array must be sorted first for Binary search.
9. Choose the correct pair.
   a) 0 (1) - Worst case b) 0 (n) - Best case
   c) 0 (n+1) - Best and Worst case d) Big (omega) - Best case
10. Which of the following statement is true?
    a) Space Factor is the maximum memory space required by an algorithm
    b) Space Factor is the minimum memory spaces required by an algorithm
    c) none of these
11. How many components required to find the space required by an algorithm?
    a) 6 b) 4 c) 2 d) 3
12. Which of the following is a finite set of instructions to accomplish a particular task?

a) Algorithm b) Flow chart c) Pseudo code d) Program

13. Choose the incorrect pair.
a) Finiteness - Terminate b) Definiteness - Defined
c) Effectiveness - Carried d) Correctness - Unambiguous

14. Linear search is also called
a) Selection search b) Binary search c) Quick search d) Sequential search

15. 0(n) is an example of
a) Null case b) best case c) Average case d) worst case

16. Which of the following are the characteristics of an algorithm?
(i) Definiteness (ii) Correctness (iii) Effectiveness
a) i, ii b) ii, iii c) Only ii d) i, ii and iii

17. Choose the incorrect statement:
(i) Dynamic programming is an algorithmic design method.
(ii) Dynamic programming approach is similar to the selection sort.
(iii)Dynamic algorithms uses memorization.
(iv)Dynamic algorithms will try to check the results of solved problems
a) (i) and (ii) b) (ii) and (iii) c) (iii) and (iv) d) (iv) and (ii)

18. Match the following

(i) Finiteness	-	A .Well defined
(ii) Definiteness	-	B. Must terminate
(iii) Effectiveness	-	C. Clear
(iv) Unambiguous	-	D. Error Free

a) (i) - B, (ii) - C, (iii) - D, (iv) - A b) (i)- B, (ii) - A, (iii) - D, (iv) - C
c) (i)- c, (ii)- D, (iii) - B, (iv) - A d) (i)- C, (ii)- B, (iii) - A, (iv) - D

19. Choose the correct statement:
a) Program is a group of files. b) Algorithm can be implemented by operating system.
c) Program should be written for any language.
d) Program is more specific to a programming language.

20. Performance evaluation of an algorithm can be divided into _____ different phases.
a) 1 b) 4 c) 3 d) 2

21. In space complexity, the space required by an algorithm is equal to the sum of _____ part and _____ part.

22. 0(1) is an example of
a) best case b) worst case c) Average case d) Null casd

23. The complexity of Binary search is _____.

24. Choose the correct typical algorithm from the following.
a) Input → Output → Process b) Output → Inputs → Process
c) Input → Process → Output d) Process → Input → Output

25. A theoretical performance analysis of an algorithm is called _____
a) Posteriori testing b) Algorithmic testing
c) Priori estimates d) Algorithmic efficiency

26. _____ is the reverse of Big O.
a) Big O b) Big Ω c) Big μ d) Big α

27. Which search technique is also called sequential search techniques?
a) Binary b) Binary Tree c) Hash d) Linear

28. Choose the correct statement.
a) Two main measures for the efficiency of an algorithm are Time and Space.
b) Search is the way of defining algorithm.
c) There is a specific rules for algorithm writing.

29. Which of the following notation is often used to describe the worst-case fan algorithm?
a) Big O b) Big Ω c) Big μ d) Big α

30. Which of the following is to describe the worst-case algorithm?
a) Big O b) Big Ω c) Big μ d) Big α

31. What value will be returned by the linear search technique if value is not found?
a) 0 b) 1 c) -1 d) +1

32. In Binary Search, if the search element is _____ to the middle element of the array, then index of the middle element is returned.
a) > b) < c) = d) < >

33. Choose the incorrect statement from the following.
(i) Linear search is also called sequential search
(ii) Bubble sort is also called comparison sort
(iii) Dynamic algorithms does not uses optimization technique memorization.
(iv) Binary search algorithm can not be done as divide and conquer search algorithm.
a) i and ii b) ii and iii c) iii and iv d) Only iv

34. How many number of passes are used in the Insertion Sort to get the final sorted list?
a) 0 b) 1 c) n d) n - 1

35. The amount of memory required to run an algorithm completion is known by
a) Space complexity of an algorithm b) Efficiency of an algorithm
c) Performance analysis of an algorithm d) Time complexity of an algorithm

36. Efficiency of an algorithm decided by
a) Definiteness, portability b) Time, Space c) Priori, Postriori d) Input/output

37. Which of the following is not a sorting technique?
a) Bubble b) Quick c) Insertion d) Binary

38. Which search algorithm can be done as divide-and-conjurer search algorithm?
a) Half-interval b) linear c) Sequential d) Bubble

39. An algorithm that yields expected output for a valid input is called as _____.

40. Linear search also called:
a) Sequential search b) Binary search c) Quick search d) Selection search

41. _____ is used to describe the lower bound of asymptotic function.
a) Big Alpha b) Big Beta c) Big O d) Big Omega

42. Bubble sort is also called:
a) Sequential search b) Quick search c) Comparison sort d) Binary sort

43. _____ is an example for dynamic programming approach.
a) Fibonacci b) Prime c) Factorial d) Odd or Even

44. Match the following:
(1) Linear search - (i) o(n2)
(2) Binary - (ii) o(n)
(3) Bubble Sort - (iii) o(log n)
(4) Merge Sort - (iv) o(n log n)
a) 1 - (ii), 2 - (iii), 3 - (i), 4 - (iv) b) 1 - (i), 2 - (ii), 3 - (iii), 4 - (iv)
c) 1 - (iv), 2 - (iii), 3 - (ii), 4 - (i) d) 1 - (iv), 2 - (ii), 3 - (i), 4 - (iii)

45. _____ is used to describe the upper bound of a asymptotic function.
a) Big μ b) Big Ω c) Big O d) Big α

46. Match the following
(i)Big 0 - A .Best-case
(ii)Big (omega) - B.Key operation
(iii)Time - C.Memory space
(iv)Space - D.Memory space
a) (i) - D, (ii) - A, (iii) - B, (iv) - C b) (i)- D, (ii) - C, (iii) - B, (iv) - A
c) (i) - c, (ii) - B, (iii) - A, (iv) - D d) (i) - C, (ii) - A, (iii) - D, (iv) - B

47. _____ is an example for variable part of space complexity.

48. In which programming the solutions of overlapped sub-problems are combined in order to get the better solution?
a) Object oriented b) Procedural c) Modular d) Dynamic

49. Pick the odd one out:
a) Simplicity b) Flowchart c) Feasibility d) Portable

50. Which one of the following is not a characteristics of Bubble Sort?
a) Simple b) too slow c) too fast d) less efficient

51. The word Algorithm has come to refer to a method _____.

a) solve a problem b) insert a data c) delete data d) update data

52. A _____ or _____ trade off is a way of solving in less time by using more storage space or by solving a given algorithm in very little space by spending more time.

53. Choose the correct pair.
a) Space complexity - Size of input b) A fixed part - Performance
c) A variable part - Recursion d) Time complexity - Variables

54. Choose the incorrect pair.
a) Finiteness - Terminate b) Definiteness - Defined
c) Effectiveness - Carried d) Correctness - Unambiguous

55. Assertion (A): An algorithm is a finite set of instructions.
Reason (R): An algorithm can be implemented in any suitable programming language.
a) Both A and R are correct and R is the correct explanation for A. b) A is True, But R is False.
c) A is False, But R is True d) Both A and R are False.

56. Which of the following algorithm used memorization?
a) Static b) Dynamic c) Modular d) Object

57. Which technique is followed by Binary Search algorithm?
a) subroutines b) mapping c) divide and conquer d) Namespaces

58. Which is true related to the efficiency of an algorithm?
i) Less time, more storage space.
ii) More time, very little space.
a) i is correct b) ii is correct c) both are correct d) both are wrong

59. Which of the following is not an example of data structures?
a) Dictionary b) List c) Control statement d) Structure

60. Which characteristics of algorithm defined the operation involving division by zero?
a) Finiteness b) Correctness c) Definiteness d) Input

61. _____ are languages that uses meaningful statements about time and space complexity?
a) Time and space trade b) Asymptotic notations
c) Complexity notations d) Algorithmic notations

62. The complexity of Bubble Sort is _____.

63. Match the following

(i)Linear	-	A .Comparison
(ii)Binary	-	B.Exchange
(iii)Bubble	-	C.half-interval
(iv)Selection	-	D.Sequential

a) (i) - D, (ii) - A, (iii) - B, (iv) - C b) (i) - B, (ii) - C, (iii) - D, (iv) - A
c) (i) - D, (ii) - C, (iii) - A, (iv) - B d) (i) - B, (ii) - D, (iii) - A, (iv) - C

64. Which one of the following is not an Asymptotic notations?
a) Big O b) Big Ω c) Big μ d) Big ⊗

65. The way of defining an algorithm is called
a) Algorithmic strategy b) Pseudo strategy
c) Programmic strategy d) Data structured strategy

66. Which search algorithm is called as Half-Interval search algorithm?
a) Binary b) Binary Tree c) Hash d) Linear

67. How many asymptotic notations are mostly used to represent time complexity of algorithms?
a) 2 b) 3 c) 4 d) 5

68. Which of the following algorithm used memorization?
a) Efficient b) Dynamic c) Effective d) Modular

69. Choose the incorrect pair from the following.
a) Big O - Worst case b) Big Ω - First case
c) Big μ - Best case d) Big α - Average case

70. Which approach is similar to divide and conquer method?
a) Dynamic programming b) Object oriented
c) Procedural d) Modular

71. Data are maintained and manipulated effectively through _____ .
a) Algorithm b) Program c) Data Structures d) Pseudocode

72. Assertion (A): Big 0 is often used to describe the best case of an algorithm.
Reason (R): Big omega is used to describe the worst case of an algorithm.
a) Both A and R are correct and R is the correct explanation for A. b) A is True, But R is False.
c) A is False, But R is True. d) Both A and R are False.

73. Choose the incorrect statement from the following.
a) Prior estimates is a theoretical performance analysis of an algorithm
b) Posteriori testing is called performance analysis of an algorithm.
c) Efficiency of an algorithm decided by time and space factor.
d) Space required by an algorithm is equal to the sum of fixed part and variable part

74. How many asymptotic notations are used to represent time complexity of an algorithms?
a) 1 b) 2 c) 3 d) 4

75. _____ is a simple sorting algorithm.
a) Binary b) Bubble c) Selection d) Insertion

76. _____ approach is similar to divide and conquer.

77. Which sorting techniques working by taking elements from the list one by one and inserting them in their correct position into a new sorted list?
a) Bubble b) Selection c) Insertion d) Merge

78. Pick the odd one out:
a) Search b) Sort c) Update d) Syntax

79. Which of the following component is defined as the total space required to store certain data and variables for an algorithm?
a) Time part b) Variable part c) Fixed part d) Memory part

80. Pick the odd one out.
a) Merge Sort b) Bubble c) Binary d) Insertion

81. Space required by an algorithm = Fixed part + _____ .
a) Constant part b) Second part c) Variable part d) Time part

82. Time is measured by counting the number of key operations like comparisons in the sorting algorithm. This is called as _____.
a) Space Factor b) Key Factor c) Priori Factor d) Time Factor

83. Match the following

(i)Big 0	-	A .Best-case
(ii)Big (omega)	-	B.Key operation
(iii)Time	-	C.Memory space
(iv)Space	-	D.Memory space

a) (i) - D, (ii) - A, (iii) - B, (iv) - C b) (i)- D, (ii) - C, (iii) - B, (iv) - A
c) (i) - c, (ii) - B, (iii) - A, (iv) - D d) (i) - C, (ii) - A, (iii) - D, (iv) - B

84. Choose the incorrect statement from the following.
(i) In Algorithm, All operations in should be well defined
(ii) Algorithms must not terminate after finite number of steps.
(iii) In algorithms, errors are acceptable
(iv) An algorithm should have step-by-step directions.
a) i and ii b) i, iii and iv c) ii and iii d) iii only

85. The number of steps taken by the algorithm to complete the process is known as
a) Performance analysis of an algorithm b) Efficiency of an algorithm
c) Space complexity of an algorithm d) Time complexity of an algorithm

86. Which sorting algorithm compares each pair of adjacent elements and swaps them if they are in the unsorted order?
a) Selection b) Merge c) Insertion d) None of these

87. Which of the following is the reverse of Big O?
a) Big O b) Big μ c) Big Ω d) Big α

88. Which characteristics of an algorithm should be generic, independent of any programming language?
a) Independent b) Portable c) Feasibility d) Unambiguous

89. The complexity of Merge Sort is _____.

90. In Binary search, if the search element is greater than the number in the middle index, then select

the elements to the side of the middle index.
a) right b) left c) middle d) bottom

91. Pick the odd one out:
a) Binary b) Bubble c) Selection d) Insertion

92. Which sorting algorithm sort is by making only one exchange for every pass through the list?
a) Bubble b) Merge c) Comparison d) Selection

93. Which of the following optimization technique used in dynamic algorithms.
a) Decomposition b) Specification c) Memorization d) Composition

94. Which of the following is not a characteristic of an algorithm?
a) Effectiveness b) Definiteness c) Correctness d) Data structure

95. Which sorting algorithm repeatedly selects the next smallest element and swaps in into the right place for every pass?
a) Bubble sort b) Selection sort c) Sequential sort d) Heap sort

96. Program should be written for the selected language with specific _____.

97. _____ describes the worst case of an algorithm.
a) Big μ b) Big O c) Big Ω d) Big α

98. Binary search also called:
a) Sequential search b) Quick search c) Half-interval search d) Linear search

99. Algorithm resembles a _____ which can be implemented in any programming language.
a) Pseudocode b) Function c) Solution d) Program

100. _____ is an expression of algorithm in a programming language.

ANSWERS

1. a) Algorithm
2. a) Data
3. a) Algorithmic Solution
4. b) Time, space
5. a) Both A and R are correct, and R is the correct explanation for A.
6. d) Algorithm
7. b) Half-interval search
8. c) Linear search also called Random search. z
9. d) Big (omega) - Best case
10. a) Space Factor is the maximum memory space required by an algorithm
11. c) 2
12. a) Algorithm
13. d) Correctness - Unambiguous
14. d) Sequential search
15. d) worst case
16. d) i, ii and iii
17. a) (i) and (ii)
18. b) (i)- B, (ii) - A, (iii) - D, (iv) - C
19. d) Program is more specific to a programming language.
20. d) 2
21. fixed, variable
22. a) best case
23. o(log n)
24. c) Input → Process → Output
25. c) Priori estimates
26. b) Big
27. d) Linear
28. a) Two main measures for the efficiency of an algorithm are Time and Space.
29. a) Big O
30. a) Big O
31. c) -1

c) =
c) iii and iv
d) n - 1
a) Space complexity of an algorithm
b) Time, Space
d) Binary
a) Half-interval
algorithmic solution
a) Sequential search
d) Big Omega
c) Comparison sort
a) Fibonacci
a) 1 - (ii), 2 - (iii), 3 - (i), 4 - (iv)
c) Big O
a) (i) - D, (ii) - A, (iii) - B, (iv) - C
Recursion
d) Dynamic
b) Flowchart
c) too fast
a) solve a problem
space - time, time - memory
c) A variable part - Recursion
d) Correctness - Unambiguous
a) Both A and R are correct and R is the correct explanation for A.
b) Dynamic
c) divide and conquer
c) divide and conquer
c) both are correct
c) Control statement
c) Definiteness
b) Asymptotic notations
O(n2)
c) (i) - D, (ii) - C, (iii) - A, (iv) - B
d) Big ⊗
a) Algorithmic strategy
a) Binary
b) 3
b) Dynamic
b) Big Ω - First case
a) Dynamic programming
c) Data Structures
d) Both A and R are False.
b) Posteriori testing is called performance analysis of an algorithm.
c) 3
b) Bubble
Dynamic programming
c) Insertion
d) Syntax
c) Fixed part
c) Binary
c) Variable part
d) Time Factor
a) (i) - D, (ii) - A, (iii) - B, (iv) - C
c) ii and iii
d) Time complexity of an algorithm

86. d) None of these
87. c) Big Ω
88. b) Portable
88. b) Portable
89. O(n log n)
90. a) right
91. a) Binary
92. d) Selection
93. c) Memorization
94. d) Data structure
95. b) Selection sort
96. syntax
97. b) Big O
98. d) Linear search
99. a) Pseudocode
100. program

PART B

1. What is an Algorithm?

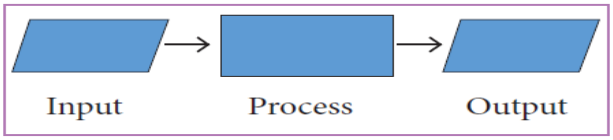
An algorithm is a finite set of instructions to accomplish a particular task. It is a step-by-step procedure for solving a given problem.

2. What is called algorithmic strategy? Given an example.

The way of defining an algorithm is called algorithmic strategy.

For example to calculate factorial for the given value **n** then it can be done by defining the function to calculate factorial once for the iteration-1 then it can be called recursively until the number of required iteration is reached.

3. Draw picture to show the process of an algorithm.



4. **What do you mean by algorithmic solution?**

An algorithm that yields expected output for a valid input is called an algorithmic solution.

5. Design an algorithm to find square of the given number and display the result.

The algorithm can be written as:
Step 1 – start the process
Step 2 – get the input x
Step 3 –calculate the square by multiplying the input value ie., square ← x* x
Step 4 – display the result square
Step 5 – stop

6. What are the various data manipulations?

Data manipulations are
Searching
Sorting
Inserting
Updating
Deleting an item.

7. Define Pseudo code.

- It is an implementation of an algorithm in the form of annotations and informative text written in plain English.
- It has no syntax like any of the programming language and thus can't be compiled or interpreted by the computer.

8. Who is an Algorist?

Algorist may refer to:

- A person skilled in the technique of performing basic decimal arithmetic, known as algorism
- One who practices algorism is known as an algorist.
- A person skilled in the design of algorithms
- An algorithmic artist

9. What is Sorting?

Arranging the data in ascending or descending order is called soring.

10. What is searching? Write its types.

Searching is the process of finding a particular data in a collection of data.

Types:

- Linear Search or Sequential Search
- Binary Search

11. Which is a best algorithm to solve a problem?

The best algorithm to solve a given problem is one that requires less space in memory and takes less time to execute its instructions to generate output.

12. Write note on binary search.

Binary Search

- Binary search also called half-interval search algorithm.
- It finds the position of a search element within a sorted array.
- The binary search algorithm can be done as divide-and-conquer search algorithm and executes in logarithmic time.

13 Give an example of data structures.

Arrays, Structures, List, Tuples, Dictionary.

14 How the efficiency of an algorithm is defined?

Efficiency of an algorithm is defined by the utilization of time and space complexity.

15 What does analysis of an algorithm deals with?

- Analysis of an algorithm usually deals with the running and execution time of various operations involved.
- The running time of an operation is calculated as how many programming instructions executed per operation.

16 What is algorithm analysis?

An estimation of the time and space complexities of an algorithm for varying input sizes is called algorithm analysis.

17 What are the Asymptotic notations?

Asymptotic notations are languages that use meaningful statements about time and space complexity.

PART C

1. List the characteristics of an algorithm.

The characteristics of an algorithm:

- Input
- Output
- Finiteness
- Definiteness
- Effectiveness
- Correctness
- Simplicity
- Unambiguous
- Feasibility
- Portable
- Independent

2. Differentiate Algorithm and Program.

Algorithm	Program
Algorithm helps to solve a given problem logically and it can be contrasted with the program.	Program is an expression of algorithm in a programming language.
Algorithm can be categorized based on their implementation methods, design techniques etc.	Program can be implemented by structured or object oriented programming approach.
Algorithm is no specific rules for algorithm writing but some guidelines should be followed.	Program should be written for the selected language with specific syntax.
Algorithm resembles a pseudo code which can be implemented in any language.	Program is more specific to a programming language.

3. What are the phases of analysis of an algorithm?

Analysis of algorithms and performance evaluation can be divided into two different phases:

A Priori estimates:

This is a theoretical performance analysis of an algorithm. Efficiency of an algorithm is measured by assuming the external factors.

A Posteriori testing:

This is called performance measurement. In this analysis, actual statistics like running time and 3 required for the algorithm executions are collected.

4. Discuss about Algorithmic complexity and its types.

Computer resources are limited. Efficiency of an algorithm is defined by the utilization of time and space complexity.

Time Complexity:

The Time complexity of an algorithm is given by the number of steps taken by the algorithm to complete the process.

Space Complexity:

Space complexity of an algorithm is the amount of memory required to run to its completion.

Example:

Suppose A is an algorithm and n is the size of input data, the time and space used by the algorithm A are the two main factors, which decide the efficiency of A.

5. What are the factors that influence time and space complexity.

Time Factor:

- Time is measured by counting the number of key operations like comparisons in the sorting algorithm.

Space Factor:

- Space is measured by the maximum memory space required by the algorithm.

6. Explain Space complexity.

Space Complexity

Space complexity of an algorithm is the amount of memory required to run to its completion.

The space required by an algorithm is equal to the sum of the following two components:

- A fixed part is defined as the total space required to store certain data and variables for an algorithm. For example, simple variables and constants used in an algorithm.
- A variable part is defined as the total space required by variables, which sizes depends on the problem and its iteration. For example: recursion used to calculate factorial of a given value n.

7. Write a note on Space-Time tradeoff.

- A space-time or time-memory tradeoff is a way of solving in less time by using more storage space or by solving a given algorithm in very little space by spending more time.
- To solve a given programming problem, many different algorithms may be used. Some of these algorithms may be extremely time-efficient and others extremely space-efficient.
- Time/space trade off refers to a situation where you can reduce the use of memory at the cost of slower program execution, or reduce the running time at the cost of increased memory usage.

8. Write a note on Asymptotic notation.

Asymptotic Notations

Asymptotic notations are languages that use meaningful statements about time and space complexity. The following three asymptotic notations are mostly used to represent time complexity of algorithms:

(i) Big O

Big O is often used to describe the worst-case of an algorithm.

(ii) Big Ω

Big Omega is the reverse Big O, if Big O is used to describe the upper bound (worst - case) of a asymptotic function, Big Omega is used to describe the lower bound (best-case).

(iii) Big Θ

When an algorithm has a complexity with lower bound = upper bound, say that an algorithm has a complexity O (n log n) and Ω (n log n), it's actually has the complexity Θ (n log n), which means the running time of that algorithm always falls in n log n in the best-case and worst-case.

9. What are the advantages of Pseudocode?

Advantages of Pseudocode

- Improves the readability of any approach.
- Acts as a biridge between the program and the algorithm or flowchart. Also works as a rough documentation, so the program of one developer can be understood easily when a pseudo code is written out.
- The main goal of a pseudo code is to explain what exactly each line of a program should do, hence making the code construction phase easier for the programmer.

10. What do you understand by Dynamic programming?

- Dynamic programming approach is similar to divide and conquer. The given problem is divided into smaller and yet smaller possible sub-problems.
- Dynamic programming is used whenever problems can be divided into similar sub-problems. so that their results can be re-used to complete the process.
- Dynamic programming approaches are used to find the solution in optimized way. For every inner sub-problem, dynamic algorithm will try to check the results of the previously solved sub-problems.
- The solutions of overlapped sub-problems are combined in order to get the better solution.

11. Steps to do Dynamic programming:

- The given problem will be divided into smaller overlapping sub-problems.
- An optimum solution for the given problem can be achieved by using result of smaller sub-problem.
- Dynamic algorithms uses Memoization.

12. Write about linear search.

Linear Search

Linear search also called sequential search is a sequential method for finding a particular value in a list. This method checks the search element with each element in sequence until the desired element is found or the list is exhausted. In this searching algorithm, list need not be ordered.

13. Explain example for Fibonacci Series.

Fibonacci series generates the subsequent number by adding two previous numbers.

Fibonacci series starts from two numbers − Fib 0 & Fib 1. The initial values of Fib 0 & Fib 1 can be taken as 0 and 1.

Fibonacci series satisfies the following conditions :

Fibn = Fibn-1 + Fibn-2

Hence, a Fibonacci series for the n value 8 can look like this

Fib8 = 0 1 1 2 3 5 8 13

PART D

1. Explain the characteristics of an algorithm.

Input	Zero or more quantities to be supplied
Output	At least one quantity is produced
Finiteness	Algorithms must terminate after finite number of steps
Definiteness	All operations should be well defined. For example operations involving division by zero or taking square root for negative number are unacceptable
Effectiveness	Every instruction must be carried out effectively
Correctness	The algorithms should be error free
Simplicity	Easy to implement
Unambiguous	Algorithm should be clear and unambiguous. Each of its steps and their inputs/outputs should be clear and must lead to only one meaning
Feasibility	Should be feasible with the available resources.
Portable	An algorithm should be generic, independent of any programming language or an operating system able to handle all range of inputs.
Independent	An algorithm should have step-by-step directions, which should be independent of any programming code.

2. Discuss about Linear search algorithm.

Linear Search

Linear search also called sequential search is a sequential method for finding a particular value in a list. This method checks the search element with each element in sequence until the desired element is found or the list is exhausted. In this searching algorithm, list need not be ordered.

Pseudo code

Traverse the array using for loop

In every iteration, compare the target search key value with the current value of the list.

1) If the values match, display the current index and value of the array
2) If the values do not match, move on to the next array element.

If no match is found, display the search element not found.

To search the number 25 in the array given below, linear search will go step by step in a sequential order starting from the first element in the given array if the search element is found that index is returned otherwise the search is continued till the last index of the array. In this example number 25 is found at index number 3.

Index	0	1	2	3	4
value	10	12	20	25	30

Example 1:

Input: values[] = {5, 34, 65, 12, 77, 35}
target = 77
Output: 4

Example 2:

Input: values[] = {101, 392, 1, 54, 32, 22, 90, 93}
target = 200
Output: -1 (not found)

3 What is Binary search? Discuss with example.

Binary search also called half-interval search algorithm. It finds the position of a search element within a sorted array. The binary search algorithm can be done as divide-and-conquer search algorithm and executes in logarithmic time.

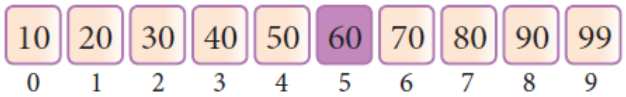
Pseudo code for Binary search

1. Start with the middle element:

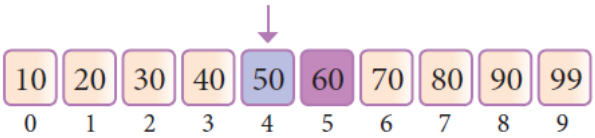
If the search element is equal to the middle element of the array i.e., the middle value = number of elements in array/2, then return the index of the middle element.
If not, then compare the middle element with the search value, If the search element is greater than the number in the middle index, then select the elements to the right side of the middle index, and go to Step-1.
If the search element is less than the number in the middle index, then select the elements to the left side of the middle index, and start with Step-1.
2. When a match is found, display success message with the index of the element matched.
3. If no match is found for all comparisons, then display unsuccessful message.

Binary Search Working principles

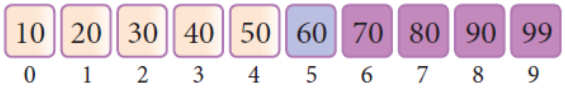
List of elements in an array must be sorted first for Binary search. The following example describes the step by step operation of binary search. Consider the following array of elemnts, the array is being sorted so it enables to do the binary search algorithm. Let us assume that the search element is 60 and we need to search the location or index of search element 60 using binary search.



First, we find index of middle element of the array by using this formula :
mid = low + (high - low) / 2
Here it is, 0 + (9 - 0) / 2 = 4 (fractional part ignored). So, 4 is the mid value of the array.

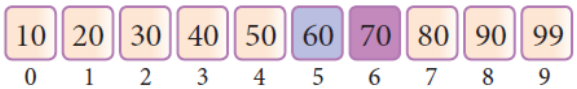


Now compare the search element with the value stored at mid value location 4. The value stored at location or index 4 is 50, which is not match with search element. As the search value 60 is greater than 50.

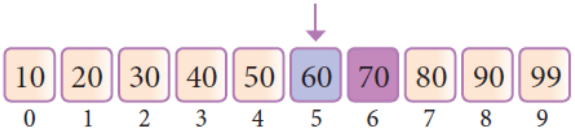


Now we change our low to mid + 1 and find the new mid value again using the formula.
low to mid + 1
mid = low + (high - low) / 2
Our new mid is 7 now. We compare the value stored at location 7 with our target value 31.

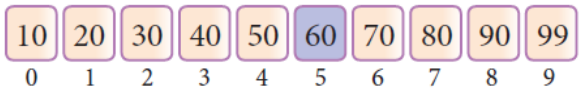
The value stored at location or index 7 is not a match with search element, rather it is more than what we are looking for. So, the search element must be in the lower part from the current mid value location



The search element still not found. Hence, we calculated the mid again by using the formula.
high = mid -1
mid = low + (high - low)/2
Now the mid value is 5.



Now we compare the value stored at location 5 with our search element. We found that it is a match.



We can conclude that the search element 60 is found at location or index 5. For example if we take the search element as 95, For this value this binary search algorithm return unsuccessful result.

4. Explain the Bubble sort algorithm with example.

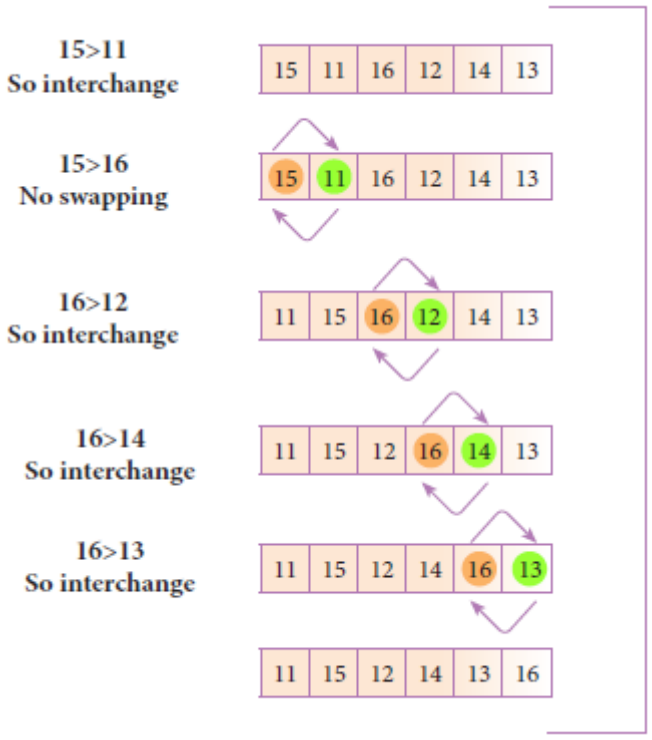
Bubble sort is a simple sorting algorithm. The algorithm starts at the beginning of the list of values stored in an array. It compares each pair of adjacent elements and swaps them if they are in the unsorted order. This comparison and passed to be continued until no swaps are needed, which indicates that the list of values stored in an array is sorted. The algorithm is a comparison sort, is named for the way smaller elements "bubble" to the top of the list. Although the algorithm is simple, it is too slow and less efficient when compared to insertion sort and other sorting methods.

Assume list is an array of n elements. The swap function swaps the values of the given array elements.

Pseudo code

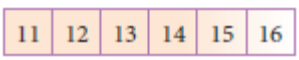
- Start with the first element i.e., index = 0, compare the current element with the next element of the array.
- If the current element is greater than the next element of the array, swap them.
- If the current element is less than the next or right side of the element, move to the next element. Go to Step 1 and repeat until end of the index is reached.

Let's consider an array with values {15, 11, 16, 12, 14, 13} Below, we have a pictorial representation of how bubble sort will sort the given array.



The above pictorial example is for iteration-1. Similarly, remaining iteration can be done. The final iteration will give the sorted array.

At the end of all the iterations we will get the sorted values in an array as given below:



5 Explain the concept of Dynamic programming with suitable example.

- Dynamic programming approach is similar to divide and conquer. The given problem is divided into smaller and yet smaller possible sub-problems.
- Dynamic programming is used whenever problems can be divided into similar sub-problems. so that their results can be re-used to complete the process.
- Dynamic programming approaches are used to find the solution in optimized way. For every inner sub-problem, dynamic algorithm will try to check the results of the previously solved sub-problems.
- The solutions of overlapped sub-problems are combined in order to get the better solution.

Steps to do Dynamic programming:

- The given problem will be divided into smaller overlapping sub-problems.
- An optimum solution for the given problem can be achieved by using result of smaller sub-problem.
- Dynamic algorithms uses Memoization.

Example: Fibonacci Series generation

Fibonacci series generates the subsequent number by adding two previous numbers.

Fibonacci series starts from two numbers – Fib 0 & Fib 1. The initial values of Fib 0 & Fib 1 can be taken as 0 and 1.

Fibonacci series satisfies the following conditions :

Fibn = Fibn-1 + Fibn-2

Hence, a Fibonacci series for the n value 8 can look like this

Fib8 = 0 1 1 2 3 5 8 13

6 Explain Selection sort algorithm with example.

The selection sort is a simple sorting algorithm that improves on the performance of bubble sort by making only one exchange for every pass through the list. This algorithm will first find the smallest elements in array and swap it with the element in the first position of an array, then it will find the second smallest element and swap that element with the element in the second position, and it will continue until the entire array is sorted in respective order.

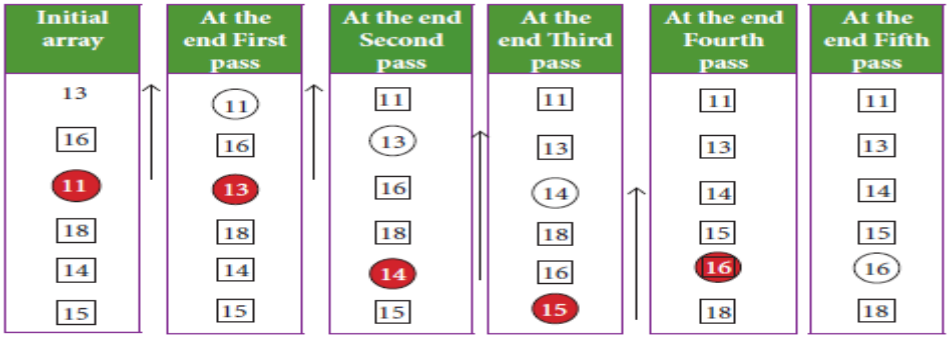
This algorithm repeatedly selects the next-smallest element and swaps in into the right place for every pass. Hence it is called selection sort.

Pseudo code

- Start from the first element i.e., index-0, we search the smallest element in the array, and replace it with the element in the first position.
- Now we move on to the second element position, and look for smallest element present in the sub-array, from starting index to till the last index of sub - array.
- Now replace the second smallest identified in step-2 at the second position in the or original array, or also called first position in the sub array.
- This is repeated, until the array is completely sorted.

Let's consider an array with values {13, 16, 11, 18, 14, 15}

Below, we have a pictorial representation of how selection sort will sort the given array.



- In the first pass, the smallest element will be 11, so it will be placed at the first position.
- After that, next smallest element will be searched from an array. Now we will get 13 as the smallest, so it will be then placed at the second position.

- Then leaving the first element, next smallest element will be searched, from the remaining elements. We will get 13 as the smallest, so it will be then placed at the second position.
- Then leaving 11 and 13 because they are at the correct position, we will search for the next smallest element from the rest of the elements and put it at third position and keep doing this until array is sorted.
- Finally we will get the sorted array end of the pass as shown above diagram.

7 Explain Insertion sort algorithm with example.

Insertion sort is a simple sorting algorithm. It works by taking elements from the list one by one and inserting then in their correct position in to a new sorted list. This algorithm builds the final sorted array at the end. This algorithm uses n-1 number of passes to get the final sorted list as per the pervious algorithm as we have discussed.

Pseudo for Insertion sort

Step 1 – If it is the first element, it is already sorted.
Step 2 – Pick next element
Step 3 – Compare with all elements in the sorted sub-list
Step 4 – Shift all the elements in the sorted sub-list that is greater than the value to be sorted
Step 5 – Insert the value Step 6 – Repeat until list is sorted

44	16	83	07	67	21	34	45	10	Assume 44 is a sotec list of 1 item
16	44	83	07	67	21	34	45	10	inserted 16
16	44	83	07	67	21	34	45	10	inserted 83
07	16	44	83	67	21	34	45	10	inserted 07
07	16	44	67	83	21	34	45	10	inserted 67
07	16	21	44	67	83	34	45	10	inserted 21
07	16	21	34	44	67	83	45	10	inserted 34
07	16	21	34	44	45	67	83	10	inserted 45
07	10	16	21	34	44	45	67	83	inserted 10

At the end of the pass the insertion sort algorithm gives the sorted output in ascending order as shown below:

07	10	16	21	34	44	45	67	83

8 Explain Best,worst and average case efficiency algorithm with an example.

- Let us assume a list of n number of values stored in an array. Suppose if we want to search a particular element in this list, the algorithm that search the key element in the list among n elements, by comparing the key element with each element in the list sequentially.
- The best case would be if the first element in the list matches with the key element to be searched in a list of elements. The efficiency in that case would be expressed as O(1) because only one comparison is enough.
- Similarly, the worst case in this scenario would be if the complete list is searched and the element is found only at the end of the list or is not found in the list. The efficiency of an algorithm in that case would be expressed as O(n) because n comparisons required to complete the search.
- The average case efficiency of an algorithm can be obtained by finding the average number of comparisons as given below:

Minimum number of comparisons = 1
Maximum number of comparisons = n
If the element not found then maximum number of comparison = n
Therefore, average number of comparisons = (n + 1)/2
Hence the average case efficiency will be expressed as O (n).

9 Explain complexity of an algorithm.

Time Factor:

- Time is measured by counting the number of key operations like comparisons in the sorting algorithm.

Space Factor:

- Space is measured by the maximum memory space required by the algorithm.

Time Complexity:

The Time complexity of an algorithm is given by the number of steps taken by the algorithm to complete the process.

Space Complexity:

Space complexity of an algorithm is the amount of memory required to run to its completion.

Example:

Suppose A is an algorithm and n is the size of input data, the time and space used by the algorithm A are the two main factors, which decide the efficiency of A.

Space complexity of an algorithm is the amount of memory required to run to its completion.

The space required by an algorithm is equal to the sum of the following two components:

- A fixed part is defined as the total space required to store certain data and variables for an algorithm. For example, simple variables and constants used in an algorithm.
- A variable part is defined as the total space required by variables, which sizes depends on the problem and its iteration. For example: recursion used to calculate factorial of a given value n.

UNIT II

CHAPTER-5

PYTHON - VARIABLES AND OPERATORS

PART-A

CHOOSE THE BEST ANSWER:

1. What must be entered in _____ from the following statement to accept the value entered as integer? X = _____ input ("Enter number")
   a) integer b) numeric c) number d) int
2. _____ are used to indicate blocks of codes in python.
   a) whitespaces b) { } c) [ ] d) < >
3. What is the output for the following m = 25 if 24 < 25 else 50
   a) 50 b) 0 c) 25 d) 24<25
4. Pick the odd one out:
   a) Python b) MS-Excel c) Starcalc d) Lotus 1-2-3
5. How may logical operators in Python?
   a) 5 b) 4 c) 3 d) 2
6. How many comparative operators are there?
   a) 4 b) 5 c) 6 d) 7
7. Find the odd man out. State the reason
   a) < > b) >>> c) < d) <<<
8. Assume a = 100 and b = 35. Find the true statements.
   (i) >>> a > b
   (ii) >>> a == b
   (iii) >>> a != b
   a) (i), (iii) are true b) (ii), (iii) are true
   c) (i), (ii) are true d) All are true
9. Choose the incorrect statements from the following.
   (i) Python script is a file that contains python statements
   (ii) Python script are not reusable code
   (iii) Python scripts cannot be executed again and again without retyping
   (iv) Python scripts are editable.
   a) ii and iii b) i and ii c) iii and iv d) i and iii

10. Python source file is created using _____ mode.
a) Interactive b) Script c) Procedure d) Program
11. Octal integer uses _____ to denote octal digits.
a) OX b) O c) OC d) Od
12. Choose the Correct pair.
a) Identifiers -. Spaces b) Delimiters - Operators
c) Literal - Variable d) Data types - Tab
13. A built-in number datatype supports.
a) integers b) floating point numbers
c) Complex numbers d) all of these
14. Find the odd man out. State the reason
a) CWI b) IDE c) GUI d) IDLE
15. If a = 100, then the expression a**2 output is
a) 200 b) 10000 c) 400 d) 1000
16. Which function helps to enter data at run time by the user?
a) input ( ) b) read ( ) c) get ( ) d) Pyinput ( )
17. How many types are Numeric Literals in python?
a) 2 b) 3 c) 4 d) 5
18. Which is indicates in python that interpreter is ready to accept instructions?
a) >>> b) «< c) » d) <<
19. Which of the following date includes decimal point?
a) Character b) String c) Floating d) Boolean
20. Which data can be enclosed with Single or Double or Triple quotes?
a) Boolean b) Exponent c) String d) none of these
21. Choose the incorrect pair from the following if a = 100 and b = 45.
a) a = = b - false b) a ! = b - false
c) a > = b - True d) a < b - false
22. Choose the incorrect pair from the following.
a) x = y b) x = 'y' c) x = "y" d) x = '"y"'
23. Which of the following statement is correct?
(i) In Python, programs can be written in many ways.
(ii) Interactive mode and script mode are the modes used to write programs in Python.
(iii) Python command prompt is <<<
(iv) In Python, interactive mode displays the result immediately and also used as a calculator.
a) i and ii b) i, ii, iv c) ii and iv d) ii and iii
24. Match the following:
(i)# (hash) - A .multiline string
(ii){} (curlybraces) - B.more item single line
(iii), (comma) - C.blocks of code
(iv)"` "' (triplequote) - D.comments
a) (i) - B, (ii) - C, (iii) - D, (iv) - A b) (i)- D, (ii) - C, (iii) - B, (iv) - A
c) (i)- B, (ii) - D, (iii) - A, (iv) - C d) (i)- D, (ii) - B, (iii) - A, (iv) - C
25. _____ = input ("Prompt string").
a) variable b) integer c) keyword d) operator
26. Python uses the symbols and symbol combinations as _____ in expressions.
a) literals b) keywords c) identifiers d) delimiters
27. Numeric literals are _____.
a) Integer, Float, Complex b) Int, Float, Void c) Int, Float, Char d) Int, Float, Boolean
28. In computer programming languages _____ are special symbols which represent computation.
a) Keywords b) Literals c) Delimiters d) Operators
29. Choose the incorrect pair from the following.
a) print ("Python", "\n", "Lang..") - Python Lang..] b) print ("Doesn\'t") Doesn't
c) print ("\" Python \" ") "Python" d) print ("Python", "\t", "lang..") Python Lang
30. Which of the following defines the Python interactive mode of programming?
a) >> b) <<< c) << d) >>>

31. Choose the correct pair from the following.
a) Complex literal - 3+5.6j b) Hexadecimal literal - 0100
c) Octal literal - Ob1010 d) Binary literal - Oo310

32. Value and variables when used in operator are known as _____ .
a) Operands b) Keywords c) Identifiers d) functions

33. Which of the following is not a numerical literal type?
a) Boolean b) Integer c) Complex d) Float

34. How many logical operators are there?
a) 2 b) 3 c) 4 d) 5

35. Match the following:

(i) "\" (back slash)	-	(A) tab
(ii) "\t"	-	(B) escape character
(iii) "\n"	-	(C) carriage return
(iv) "\r"	-	(D)newline

a) (i) - B, (ii) - A, (iii) - D, (iv) - C b) (i) - B, (ii) - C, (iii) - D, (iv) - A
c) (i)- c, (ii)- D, (iii) - A, (iv) - B d) (i)- c, (ii) - B, (iii) - A, (iv) - D

36. Which name is the extension file name in python language?
a) .pi b) .py c) .bi d) .phi

37. Which mode can be used as a simple calculator?
a) line b) script c) Interactive d) Interface

38. The _____ command is used to open Python shell window.
a) File → File New b) File → New File c) File → New d) File → File Open

39. _____ is to denote hexadecimal integer.
a) 16 b) Ox c) Oc d) O

40. Which of the following is a raw data given in a variable or constant?
a) Information b) Literal c) Delimiters d) Keywords

41. Identify Not equal to operator in python.
a) < > b) == c) NOT EQUAL d) !=

42. Multiline string literal is given by _____.

43. Write the output Assume a = 100 >>> a ** 2.
a) 200 b) 1000 c) 10000 d) 10

44. IDLE means _____.

45. _____ are special words used by Python Interpreter.

46. Assertion (A): Complex numbers is made up of only integer values.
Reason (R): A Boolean data can live any of the two values.
a) Both A and R are true, and R is the correct explanation for A.
b) Both A and R are true, but R is not the correct explanation for A.
c) A is true, but R is false. d) A is false, but R is true.

47. Who was created python Language?
a) Guido Van Rossum b) John Maxwell c) Guido Wan Rouske d) Guido Maxwells

48. Choose the incorrect pair from the following.
(i) Ctrl + N to create a new python script
(i) Ctrl + S to save the python script
(iii) F5 to modify the python script
(iv) Run → Run Module to excuse the python script
a) ii and iii b) i, ii, iii c) i and ii d) i, iii, iv

49. In Python Script Editor, the errors will be shown in _____ color in the IDLE window.
a) orange b) red c) green d) blue

50. Choose the incorrect pair from the following.
a) Literal - Numeric, string, Boolean
b) Conditional operator - also known as operands operator
c) Escape sequences - \t, \\, \n d) Delimiters - Symbols and symbol combinations

51. Expand IDLE:
a) Information Development Learning Environment
b) Integrated Development Learning Environment

c) Information Development Language Environment
d) Integrated Development Logical Environment

52. Find the odd man out.
a) ' ' b) " " c) "" "" d) '" '"

53. The output function _____ is used to display the result of the Python Program.
a) out ( ) b) write ( ) c) print ( ) d) execute ( )

54. In Python, comments begin with _____ .
a) / b) \ c) # d) / /

55. What is the another name for fundamental data type?
a) Class b) Built-in c) typedef d) userdefined

56. Which of the following can be identify by an identifier?
a) variable b) function c) class d) all of these

57. Pick the odd one out.
a) Tuples, for, list, dictionaries, Number b) \n, \", \', \r, \k
c) and, or, not, true d) >, >=, <, <=, < >

58. Choose the incorrect pair from the following.
a) 102 - Decimal Integer b) 0789 - Octal Integer
c) Ox 102 - hexadecimal Integer d) 342 - Long Integer

59. >>> indicates that
a) It will not display the results immediately b) IDLE is working in script mode
c) Source program can be created and stored d) IDLE is working in Interactive mode

60. How many Arithmetic operators are there >?
a) 6 b) 7 c) 8 d) 9

61. Match List I with List II and select the correct answer using the codes given below :

List I		List II
i) 0b1010	-	1) Hexadecimal Literal
ii) 100	-	2) Octal Literal
iii) Oo310	-	3) Decimal Literal
iv) Ox12c	-	4) Binary Literal

a) (i) - 1; (ii) - 2; (iii) - 3; (iv) - 4 b) (i) - 4; (ii) - 3; (iii) - 2; (iv) - 1
c) (i) - 4; (ii) - 2; (iii) - 3; (iv) - 1 d) (i) - 1; (ii) - 3; (iii) - 2; (iv) - 4

62. Which of the following command is used to execute Python script?
a) Run → Python Module b) File → Run Module c) Run → Run Module d) Run → Module Fun

63. Python uses _____ and _____ to define program blocks.
a) Alt, Shift b) Ctrl, Shift c) Spaces, tabs d) tabs, functions

64. Assertion (A): In python, comments begin with * (asterisk).
Reason (R): The lines begins with * are considered as comments.
a) Both A and R are true, and R is the correct explanation for A.
b) Both A and R are true, but R is not the correct explanation for A.
c) A is true, but R is false. d) Both A and R are false.

65. If a = 100, then the expression a//30 is
a) 10.0 b) 3.0 c) 0.10 d) 3

66. Pick odd one out:
a) "\t" b) "\n" c) >>> d) "\r"

67. Python language was released in the year _____.
a) 1991 b) 1993 c) 1995 d) 1997

68. Numeric literals can belong to _____ different numerical types.
a) 3 b) 5 c) 4 d) 2

69. Python command prompt is _____ .
a) >>> b) >> c) <<< d) <<

70. Strings in python are represented using _____.
a) ' ' b) " " c) "' "' d) all of these

71. Compound operators comes under the category of _____ operators.

72. In Python shell window opened by pressing.
a) Alt + N b) Ctrl + N c) Shift + N d) Ctrl + Shift + N

73. Match the following:
(1) // - (i) Modulus
(2) # - (ii) Floor division
(3) % - (iii) Strings
(4) ||| ||| - (iv)Comments
a) 1 - (ii), 2 - (iv), 3 - (i), 4 - (iii) b) 1 - (i), 2 -(ii), 3 - (ii), 4 - (iv)
c) 1 - (iv), 2 - (ii), 3 - (i), 4 - (iii) d) 1 - (iv), 2 - (i), 3 - (iii), 4 - (ii)

74. In Python, the script mode programs can be stored with the extension.
a) .pyh b) .pyt c) .pon d) .py

75. _____ command is used to execute python script?
a) Run b) Compile c) Run → Run Module d) Compile → Compile Run

76. Which one of the following statement is wrong?
a) Octal Integer uses upper and lower case O
b) Hexadecimal Integer uses upper and lower case OX
c) Long integer uses upper and lower case 1
d) none of these

77. Find the odd man out.
a) Pass b) elif c) Fail d) Raise

78. Which mode can also be used as a simple calculator?
a) Calc mode b) Interactive mode c) Script mode d) Code mode

79. Choose the incorrect statement from the following.
(i) Tuples, lists and dictionaries are not fundamental data types
(ii) Python uses spaces and tabs to define program blocks
(iii) String data is denoted by O or Ox
(iv) Complex number is made up of two integer values
a) i, ii, iii b) i, ii c) ii, iii, iv d) i, iii, iv

80. Which mode can also be used as a simple calculator in Python?
a) Information b) Intelligent c) Script d) Interactive

81. Python breaks each logical line into a sequence of elementary lexical components called _____.

82. How many modes of programming are there in python?
a) 2 b) 3 c) 4 d) 5

83. How many values are made up of complex number in python?
a) 3 b) 4 c) 2 d) 5

84. Find the hexadecimal Integer.
a) 0102 b) 0876 c) 0432 d) 0X102

85. Choose the incorrect pair from the following.
a) 100 / 10 - 10.0 b) 100 *×2 – 10000 c) 100 % 30 - 10 d) 100 // 30 - 10.0

86. Which of the following operator checks the relationship between two operands?
a) Arithmetic b) Comparative c) Assignment d) Conditional

87. Which of the following is used as multiple line string?
a) " b) " " c) ' " ' " d) All of these

88. Which of the following can not be identify by an identifier
a) class b) function c) constant d) variable

89. Which operator replaces multiline if-else in Python?
a) Conditional b) Logical c) Relational d) Assignment

90. _____ data can be decimal, octal or hexadecimal.
a) Character b) Symbols c) Integer d) Escape sequence

91. Pick the odd one out:
a) Integer b) String c) Floating d) Complex

92. Which of the following statement is incorrect?
(i) Python script is a file that contains python statements
(ii) Python script are not reusable code
(iii) Python scripts can be executed many times without retyping
(iv) Python scripts are editable
a) i and iv b) iii only c) ii only d) i only

93. How many types of literals are there?
a) 2 b) 3 c) 4 d) 5
94. Which literal are immutable?
a) Integer b) Float c) Complex d) All of these
95. Choose the correct pair from the following.
a) 12.45 - Integer data b) 2EO - Exponent data
c) O102 - hexadecimal integer d) Ox432 - Octal Integer
96. Find the odd man out.
a) + = b) = = c) / / = d) / -
97. Which of the following used to develop and run Python code?
a) IDLE b) GUI c) Command prompt d) CUI
98. Which of the following characters is also called the "escape" character?
a) \ b) / c) # d) =
99. Which of the following statement are ignored by the python interpreter?
a) input ( ) b) comments c) print ( ) d) write ( ) •
100. What is the keyboard shortcut to Run?
a) F5 b) Alt + F5 c) Shift + F5 d) Ctrl + F5

ANSWERS

1. d) int
2. a) whitespaces
3. c) 25
4. a) Python
5. c) 3
6. c) 6
7. b) >>>
8. a) (i), (iii) are true
9. a) ii and iii
10. b) Script
11. b) O
12. c) Literal - Variable
13. d) all of these
14. a) CWI
15. b) 10000
16. a) input ( )
17. b) 3
18. a) >>>
19. c) Floating
20. c) String
21. b) a ! = b - false
22. d) x = '"y"'
23. c) ii and iv
24. b) (i)- D, (ii) - C, (iii) - B, (iv) - A
25. a) variable
26. d) delimiters
27. a) Integer, Float, Complex
28. d) Operators
29. a) print ("Python", "\n", "Lang..") - Python Lang..]
30. d) >>>
31. a) Complex literal - 3+5.6j
36. b) .py
37. c) Interactive
38. b) File → New File
39. b) Ox
40. b) Literal
41. d) !=
42. "' "' triple quotes
43. c) 10000
44. Integrated Development Learning Environment
45. both
46. d) A is false, but R is true.
47. a) Guido Van Rossum
48. a) ii and iii
49. b) red
50. b) Conditional operator - also known as operands operator
51. b) Integrated Development Learning Environment
52. c) "" ""
53. c) print ( )
54. c) #
55. b) Built-in
56. d) all of these
57. a) Tuples, for, list, dictionaries, Number
57. a) Tuples, for, list, dictionaries, Number
58. b) 0789 - Octal Integer
59. d) IDLE is working in Interactive mode
60. b) 7
66. c) >>>
67. a) 1991
68. a) 3
69. a) >>>
70. d) all of these
71. Assignment
72. b) Ctrl + N
73. a) 1 - (ii), 2 - (iv), 3 - (i), 4 - (iii)
74. d) .py
75. c) Run → Run Module
76. c) Long integer uses upper and lower case 1
77. c) Fail
78. b) Interactive mode
79. d) i, iii, iv
80. d) Interactive
81. tokens
82. a) 2
83. c) 2
84. d) 0X102
85. d) 100 // 30 - 10.0
86. b) Comparative
87. c) ' " ' "
88. c) constant
88. c) constant
89. a) Conditional
90. c) Integer
91. b) String
92. c) ii only
93. b) 3
94. d) All of these
95. b) 2EO - Exponent data

32. a) Operands 33. a) Boolean 34. b) 3 35. a) (i) - B, (ii) - A, (iii) - D, (iv) - C	61. b) (i) - 4; (ii) - 3; (iii) - 2; (iv) - 1 62. c) Run → Run Module 63. c) Spaces, tabs 64. d) Both A and R are false. 65. d) 3	96. b) = = 97. a) IDLE 98. a) \ 99. b) comments 100. a) F5

PART-B

1 What are the Key features of Python?

- It is a general purpose programming language which can be used for both scientifi c and non-scientifi c programming.
- It is a platform independent programming language.
- The programs written in Python are easily readable and understandable.

2 What are the different modes that can be used to test Python Program?

In Python, programs can be written in two ways namely Interactive mode and Script mode.

Interactive mode Programming .

- In interactive mode Python code can be directly typed and the interpreter displays the result(s)
- immediately.
- The interactive mode can also be used as a simple calculator.

Script mode Programming

- script is a text file containing the Python statements.
- Python Scripts are reusable code. Once the script is created, it can be executed again and again without retyping.
- The Scripts are editable.

3 How will you develop and run Python code?

The version 3.x of Python IDLE (Integrated Development Learning Environment) is used to develop and run Python code.

4 How many ways the python shell can be used?

In Python, programs can be written in two ways namely Interactive mode and Script mode.

5 How the interactive mode of Python shell can be used as simple calculator?

In interactive mode Python code can be directly typed and the interpreter displays the result(s) immediately. The interactive mode can also be used as a simple calculator.

6 How will you invoke python IDLE?

The following command can be used to invoke Python IDLE from Window OS.

Start → All Programs → Python 3.x → IDLE (Python 3.x)

7 How will you know the python IDLE working in interactive mode?

The prompt (>>>) indicates that Interpreter is ready to accept instructions. Therefore, the prompt on screen means **IDLE** is working in interactive mode.

8 What is the purpose of using Input and Output Functions?

The **input()** function helps to enter data at run time by the user and the output function **print()** is used to display the result of the program on the screen after execution.

9 Write the syntax of using print() in python.

print ("string to be displayed as output ")
print (variable)
print ("String to be displayed as output ", variable)
print ("String1 ", variable, "String 2", variable, "String 3" ……)

10 How will you display more than one item in print()?

Comma (,) is used as a separator in print ( ) to print more than one item.

11 Write the syntax of input() used in python.

Variable = input ("prompt string")

Where, **prompt string** in the syntax is a statement or message to the user, to know what input can be given.

12 Write short notes on Tokens.

Python breaks each logical line into a sequence of elementary lexical components known as **Tokens**. The normal token types are
Identifiers
Keywords
Operators
Delimiters and
Literals.

13 Write note on comments in Python.

- In Python, comments begin with hash symbol (#).
- The lines that begins with # are considered as comments and ignored by the Python interpreter.
- Comments may be single line or no multi-lines.
- The multiline comments should be enclosed within a set of #

Examples:

- # It is Single line Comment
- # It is multiline comment
- which contains more than one line #

14 How indentation is applied in Python?

Python uses whitespace such as spaces and tabs to define program blocks.
The number of whitespaces (spaces and tabs) in the indentation is not fixed, but all statements within the block must be indented with same amount spaces.

15 What are keywords?

Keywords

Keywords are special words used by Python interpreter to recognize the structure of program.
These words have specific meaning for interpreter, so they cannot be used for any other purpose.
Example : class, for, if, else

16 Define operator and operand.

In operators are special symbols which represent computations, conditional matching etc.
The value of an operator used is called operands.

17 What are the different operators that can be used in Python?

In Python the following operators are used.

- Arithmetic Operators
- Relational Operators
- Logical Operators
- Assignment Operators
- Conditional Operator

18 Write short note on logical operators with examples.

Logical operators

In python, Logical operators are used to perform logical operations on the given relational expressions.
There are three logical operators they are and, or and not.

Operator	Example	Result
Assume a = 97 and b = 35, Evaluate the following Logical expressions		
or	>>> a>b or a==b	True
and	>>> a>b and a==b	False
not	>>> not a>b	False i.e. Not True

19 Write short note on delimiters.

Delimiters

Python uses the symbols and symbol combinations as delimiters in expressions, lists, dictionaries and strings. Following are the delimiters.

(	)	[	]	{	}
,	:	.	‘	=	;
+=	-=	*=	/=	//=	%=
&=	|=	^=	>>=	<<=	**=

20 What is a literal? Explain the types of literals?

Literal is a raw data given in a variable or constant. In Python, there are various types of literals. They are

Numeric - Numeric Literals consists of digits and are immutable (unchangeable).

String - In Python a string literal is a sequence of characters surrounded by quotes.

Boolean - A Boolean literal can have any of the two values: True or False.

21 Write short notes on Exponent data?

An Exponent data contains decimal digit part, decimal point, exponent part followed by one or more digits.

Ex.: 12.E04, 24.e04

22 What are the Python Data types?

Python has Built-in or Fundamental data types such as Number, String, Boolean, tuples, lists and dictionaries.

Define Boolean Data type.

A Boolean data can have any of the two values: True or False.

Example :

Bool_var1=True

Bool_var2=False

23 Write a note on String Data type.

String data can be enclosed with single quote or double quote or triple quote.

Char_data = ‘A’

String_data= "Computer Science"

Multiline_data= """String data can be enclosed with single quote or double quote or triple quote."""

PART C

1 What do you mean by indentifers? Give the rules for naming identifiers and examples.

Identifiers

An Identifier is a name used to identify a variable, function, class, module or object.

Rules for naming idenfiers

An identifier must start with an alphabet (A..Z or a..z) or underscore (_).

Identifiers may contain digits (0 .. 9)

Python identifiers are case sensitive i.e. uppercase and lowercase letters are distinct.

Identifiers must not be a Python keyword.

Python does not allow punctuation character such as %,$, @ etc., within identifiers.

Example of valid identifiers

Sum, total_marks, regno, num1

Example of invalid identifiers

12Name, name$, total-mark, continue

2 Write short notes on Arithmetic operator with examples.

An arithmetic operator is a mathematical operator that takes two operands and performs a calculation on them. They are used for simple arithmetic. Most computer languages contain a set of such operators that can be used within equations to perform different types of sequential calculations.

Operator - Operation	Examples	Result
Assume a=100 and b=10. Evaluate the following expressions		
+ (Addition)	>>> a + b	110
- (Subtraction)	>>>a – b	90
* (Multiplication)	>>> a*b	1000
/ (Divisioin)	>>> a / b	10.0
% (Modulus)	>>> a % 30	10
** (Exponent)	>>> a ** 2	10000
// (Floor Division)	>>> a//30 (Integer Division)	3

3 Write a note on Relational or Comparative operators.

A Relational operator is also called as **Comparative** operator which checks the relationship between two operands. If the relation is true, it returns **True**; otherwise it returns **False**.

Operator - Operation	Examples	Result
Assume the value of a=100 and b=35. Evaluate the following expressions.		
== (is Equal)	>>> a==b	False
> (Greater than)	>>> a > b	True
< (Less than)	>>> a < b	False
>= (Greater than or Equal to)	>>> a >= b	True
<= (Less than or Equal to)	>>> a <= b	False
!= (Not equal to)	>>> a != b	True

4 What are the assignment operators that can be used in Python?

In Python, = is a simple assignment operator to assign values to variable. Let **a** = 5 and **b** = 10 assigns the value 5 to **a** and 10 to **b** these two assignment statement can also be given as **a,b=5,10** that assigns the value 5 and 10 on the right to the variables a and b respectively. There are various compound operators in Python like +=, -=, *=, /=, %=, **= and //= are also available.

Operator	Description	Example
Assume x=10		
=	Assigns right side operands to left variable	>>> x=10 >>> b="Computer"
+=	Added and assign back the result to left operand i.e. x=30	>>> x+=20 # x=x+20
-=	Subtracted and assign back the result to left operand i.e. x=25	>>> x-=5 # x=x-5
*=	Multiplied and assign back the result to left operand i.e. x=125	>>> x*=5 # x=x*5
/=	Divided and assign back the result to left operand i.e. x=62.5	>>> x/=2 # x=x/2

5 Explain Ternary operator with examples.

Ternary operator:

- Ternary operator is also known as conditional operator that evaluates something based on a condition being true or false.

- It simply allows testing a condition in a single line replacing the multiline if-else making the code compact.
- The Syntax conditional operator is,

Variable Name = [on_true] if [Test expression] else [on_false]

Example :

min= 50 if 49<50 else 70
min= 50 if 49>50 else 70

6 Write short notes on Escape sequences with examples.

Escape Sequences

- In Python strings, the backslash **"\"** is a special character, also called the **"escape"** character.
- It is used in representing certain whitespace characters: **"\t"** is a tab, **"\n"** is a newline, and **"\r"** is a carriage return.
- For example to print the message "It's raining", the Python command is

>>> print ("It\'s rainning")

It's rainning

Python supports the following escape sequence characters.

Escape sequence character	Description	Example	Output
\\	Backslash	>>> print("\\test")	\test
\'	Single-quote	>>> print("Doesn\'t")	Doesn't
\"	Double-quote	>>> print("\"Python\"")	"Python"
\n	New line	print("Python","\n","Lang..")	Python Lang..
\t	Tab	print("Python","\t","Lang..")	Python Lang..

7 What are string literals? Explain.

String Literals

- In Python a string literal is a sequence of characters surrounded by quotes. Python supports single, double and triple quotes for a string.
- A character literal is a single character surrounded by single or double quotes.
- The value with triple-quote "' '" is used to give multi-line string literal.

```
strings = "This is Python"
char = "C"
multiline_str = "'This is a multiline string with more than one line code."'
print (strings)
print (char)
print (multiline_str)
```

Output:

This is Python
C
This is a multiline string with more than one line code.

PART-D

1. Describe in detail the procedure Script mode programming.

Script mode Programming

- A script is a text file containing the Python statements.
- Python Scripts are reusable code.
- Once the script is created, it can be executed again and again without retyping.

The Scripts are editable.

(i) Creating Scripts in Python

- Choose **File → New File** or press **Ctrl + N** in Python shell window.

- An **untitled** blank script text editor will be displayed on screen
- Type the following code in Script editor

```
a = 100
b = 350
c = q+b
print ("The Sum=",c)
```

(ii) Saving Python Script

- Choose **File → Save** or Press **Ctrl + S**
- Now, **Save As** dialog box appears on the screen
- In the **Save As** dialog box, select the location where you want to save your Python code, and type the file name in **File Name** box. Python files are by default saved with extension**.py.** Thus, while creating Python scripts using Python Script editor, no need to specify the file extension.
- Finally, click **Save** button to save your Python script.

(iii) Executing Python Script

- Choose **Run → Run Module** or Press **F5**
- If your code has any error, it will be shown in red color in the IDLE window, and Python describes the type of error occurred. To correct the errors, go back to Script editor, make corrections, save the file using **Ctrl + S** or **File → Save** and execute it again.
- For all error free code, the output will appear in the IDLE window of Python as shown below.

2. Explain input() and print() functions with examples.

- The **input()** function helps to enter data at run time by the user.
- The output function **print()** is used to display the result of the program on the screen after execution.

The input() function :

- In Python, **input( )** function is used to accept data as input at run time.
- The syntax for **input()** function is,

Variable = input ("prompt string")

Where, **prompt string** in the syntax is a statement or message to the user, to know what input can be given.

If a prompt string is used, it is displayed on the monitor; the user can provide expected data from the input device.

The **input( )** takes whatever is typed from the keyboard and stores the entered data in the given variable.

If prompt string is not given in **input( )** no message is displayed on the screen, thus, the user will not know what is to be typed as input.

Example:

```
x = int (input("Enter Number 1: "))
y = int (input("Enter Number 2: "))
print ("The sum = ", x+y)
```

Output:

```
Enter Number 1: 34
Enter Number 2: 56
The sum = 90
```

The print() function :

In Python, the **print()** function is used to display result on the screen. The syntax for **print()** is as follows:

```
print ("string to be displayed as output " )
print (variable )
print ("String to be displayed as output ", variable)
print ("String1 ", variable, "String 2", variable, "String 3" ……)
```

Example

```
>>> print ("Welcome to Python Programming")
Welcome to Python Programming
```

```
>>> x = 5
>>> y = 6
>>> z = x + y
>>> print (z)
11
>>> print ("The sum = ", z)
The sum = 11
>>> print ("The sum of ", x, " and ", y, " is ", z)
The sum of 5 and 6 is 11
```

The **print ( )** evaluates the expression before printing it on the monitor.
The print () displays an entire statement which is specified within print ( ). **Comma (,)** is used as a separator in **print ( )** to print more than one item.

3. Discuss in detail about Tokens in Python

Python breaks each logical line into a sequence of elementary lexical components known as Tokens. The normal token types are

- Identifiers
- Keywords
- Operators
- Delimiters and
- Literals.

Identifiers :

- An Identifier is a name used to identify a variable, function, class, module or object.
- An identifier must start with an alphabet (A..Z or a..z) or underscore (_).
- Identifiers may contain digits (0 .. 9)
- Python identifiers are case sensitive i.e. uppercase and lowercase letters are distinct.
- Identifiers must not be a **python** keyword.
- Python does not allow punctuation character such as %,$, @ etc., within identifiers.

Keywords :

- Keywords are special words used by Python interpreter to recognize the structure of program.
- These words have specific meaning for interpreter, so they cannot be used for any other purpose.
- Example: class continue finally

Operators :

- In computer programming languages operators are special symbols which represent computations, conditional matching etc. The value of an operator used is called **operands**.
- Operators are categorized as Arithmetic, Relational, Logical, Assignment etc. Value and variables when used with operator are known as operands.

Delimiters :

Python uses the symbols and symbol combinations as delimiters in expressions, lists, dictionaries and strings.

Literals :

Literal is a raw data given in a variable or constant. In Python, there are various types of literals.

- Numeric
- String
- Boolean

4 Write the output for the following python code.

```
x=int (input("Type a Value for X : "))
print ("X = ",x)
print ("The x is =",x)
x+=20
print ("The x += 20 is =",x)
x-=5
print ("The x -= 5 is = ",x)
x*=5
print ("The x *= 5 is = ",x)
x/=2
print ("The x /= 2 is = ",x)
x%=3
print ("The x %= 3 is = ",x)
x**=2
print ("The x **= 2 is = ",x)
x//=3
print ("The x //= 3 is = ",x)
```

Output

```
#Demo Program to test Assignment Operators
x=int (input("Type a Value for X : "))
print ("X = ",x)
print ("The x is =",x)
x+=20
print ("The x += 20 is =",x)
x-=5
print ("The x -= 5 is = ",x)
x*=5
print ("The x *= 5 is = ",x)
x/=2
print ("The x /= 2 is = ",x)
x%=3
print ("The x %= 3 is = ",x)
x**=2
print ("The x **= 2 is = ",x)
x//=3
print ("The x //= 3 is = ",x)
```

```
Type a Value for X : 10
X = 10
The x is = 10
The x += 20 is = 30
The x -= 5 is = 25
The x *= 5 is = 125
The x /= 2 is = 62.5
The x %= 3 is = 2.5
The x **= 2 is = 6.25
The x //= 3 is = 2.0
```

CHAPTER – 6
CONTROL STRUCTURES
PART A

CHOOSE THE BEST ANSWER:

1. Which of the following statement provided control to check the true false and false block?
   a) if-else b) if c) while d) do-while
2. In Python for loop, the _____ refers to the initial, final and increment value.
   a) else b) sequence c) range d) b or c
3. The _____ part of while is optional.
4. Which of the following statements are incorrect?
   (i) if a loop is left by break, the else part is not executed
   (ii) Continue statement is used to skip the remaining part of a loop and start with next iteration.
   (iii) In python, pass statement is a null statement.
   (iv) In python, pass statement is not completely ignored by the complier.

a) iv only b) i and ii c) iii only d) iii and iv

5. Assertion (A): A sequential statement is composed of a sequence of statement which are executed one after another.
Reason (R): A code to print your name, address and phone number is an example of sequential statement.
a) Both A and R are true, And R is the correct explanation for A.
b) Both A and R are true, But R is not the correct explanation for A
c) A is true but R is false
d) Both A and R are false
6. What is the output of the following snippet?
a) False b) True c) 0 d) no output
7. Python provides _____ types of looping constructs.
a) 4 b) 6 c) 3 d) 2
8. Which statement allows to execute group of statements multiple times?
a) loop b) continue c) print d) input
9. Branching statements are otherwise called as _____.
a) alternative b) Iterative c) loop d) sequential
10. Which of the following statements are incorrect?
a) The syntax of range is range (start, step, stop)
b) In for loop, the condition is checked in the beginning.
c) In for loop range ( ) function in the resurgence to specify the initial, final and increment values.
d) range ( ) generates a list of values starting from start till stop - 1
11. Find the odd man out.
a) for b) continue c) break d) pass
12. Which punctuation should be used in the blank?
a) ; b) : c) :: d) !
13. Choose the incorrect pair:
a) program - set of statements b) loop - multiple times
c) continue - jump statement d) pass - skipped statement
14. range (20), the range count from
a) 1 to 20 b) 0 to 20 c) 0 to 19 d) 1 to 19
15. range(20) has the range value from to _____.
16. The _____ part of while is optional part of while.
a) if b) condition c) else d) elif
17. Choose the correct pair from the following:
a) branching also called looping b) alternative statements also called looping
c) alternative statement also called branching d) iteration also called branching
18. Find the odd man out.
a) Programs b) keywords c) Operator d) Identifiers
19. Which is the most comfortable loop?
a) do..while b) while c) for d) if..elif
20. How many types of looping constructs are there?
a) 1 b) 2 c) 3 d) n
21. What can be learned through alternative or branching statement?
a) looping b) classes c) functions d) decision making
22. Which statement is used to skip the remaining part of a loop and start with next iteration?
a) continue b) break c) pass d) goto
23. What plays a vital role in Python programming?
a) Statements b) Control c) Structure d) Indentation
24. Which of the following statement is used as a place holder in python?
a) if b) continue c) break d) pass
25. _____ statement provides control to check the true block as well as the false block.
26. The program statements which are executed one after another is called:
a) Sequential b) Looping c) Branching d) Iterative
27. The program statements which are executed one after another is called _____ statements.

a) looping b) Branching c) sequential d) iterative

28. The condition in the if statement should be in the form of
a) Arithmetic or Relational expression b) Arithmetic or Logical expression
c) Relational or Logical expression d) Arithmetic
29. _____ is the null statement.
a) break b) for c) continue d) pass
30. How many keywords are there to achieve Jump statements in python?
a) 1 b) 2 c) 3 d) 4
31. Which of the following is not a nested lopp?
a) for within while b) while within while c) for within if d) while within for
32. Which of the following is not a type of branching statement?
a) while b) if c) if-else d) if-elif
33. Python _____ will throw error for all indentation errors.
34. Which of the following is not control structures?
a) Sequential b) Operator c) Branching d) Looping
35. How many types of alternative or branching statements does python provides?
a) 4 b) 2 c) 3 d) increase than 3
36. range() generates a list of values starting from start till _____.
37. Identify which is not a control structure.
a) sequential b) Alternative c) Iterative d) Break
38. Which statement is used to skip the remaining part of a loop and start with next iteration?
a) condition b) pass c) break d) continue
39. Write the output for the following program
for I in range (1, 10, 2):
Print (I, end = ' ')
a) 1, 3, 5, 7 b) 1, 3, 5, 7, 9 c) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 d) 1, 3, 5
40. How many parameters are there in print function?
a) 2 b) 3 c) 4 d) 5
41. To construct a chain of if statement, else can e replaced by
a) while b) elif c) ifel d) else if
42. for i in range (0, 10, 2), print (I). The output is:
a) 1,3,5,7,9 b) 0,2,4,6,8 c) 2,4,6,8,10 d) 0,1,2,3,4,5,6,7,8,9
43. Which of the following are the executable segments that yield the result?
a) Operator b) Keywords c) Identifiers d) Statements
44. Which amongst this is not a jump statement ?
a) for b) goto c) continue d) break
45. The program segment executed based on the test of the condition are called _____
a) statement b) branding c) looping d) iteration
46. In if-else statement which block is to be executed is determined by a _____
a) Operator b) operands c) identifier d) condition
47. If a loop is left by _____, then the else part is not executed.
48. Which statement is an entry check loop in python?
a) while b) for c) do ...while d) if...elif
49. _____ is the simplest of all decision making statements.
50. A _____ is composed of a sequence of statements which are executed one after the another.
51. Find the odd man out
a) Branching b) Condition c) looping d) sequential
52. In Python, for loop uses the _____ function in the sequence to specify the initial, final and increment values.
a) Input ( ) b) range ( ) c) print ( ) d) sequence ( )
53. Escape sequences can be given using _____ parameter in print() function.
a) ret b) let c) end d) sep
54. Which one of the following is the entry check loop type?
a) while b) do while c) If d) If...else
55. Which of the following is used to alter the control flow of the process depending on the state of the

process?
a) control structure b) control statement
c) control structure or control statement d) program statement

56. Executing a set of statements multiple times are called as _____.
a) Iteration b) looping c) branching d) both a and b

57. Control of the program flows to the statements immediately after the body of the loop by using _____ statements.
a) break b) continue c) pass d) goto

58. A loop placed within another loop is called as _____ loop structure.
a) entry check b) nested c) exit check d) conditional

59. Which of the following statement is correct when the range will start the values from 1 and end at 29?
a) range (0, 29, 1) b) range (1, 30, 1) c) range (1, 29, 1) d) range (1, 1, 30)

60. In the _____ loop, the condition is any valid boolean expression returning True or false.
a) while b) if c) else d) eif

61. A program statement that causes a jump of control from one part of the program to another is called _____.

62. How many important control structures in python?
a) 3 b) 4 c) 2 d) Many

63. How many blocks can be given in Nested if .. elif .. else statements?
a) 1 b) 2 c) 3 d) n

64. elif can be considered to be abbreviation of
a) nested if b) if..else c) else if d) if..elif

65. range (30, 3, -3)-will start the range of values from _____ and end at _____.
a) 30, 3 b) 30, -3 c) 30, 0 d) 30, 6

66. Which statement is a null statement in python?
a) break b) contime c) pass d) end

67. Which of the following statements are incorrect?
(i) In a if statement there is no limit of elif clause that can be use(d)
(ii) 'else' clause if used should be placed at the en(d)
(iii) python provides three types of loop constructs.
(iv) if - elif - else is not similar to C++ nested if.
a) iii and iv b) i and ii c) ii and iii d) i and iv

68. In range (30, 3, -3), -3 denotes _____ value.
a) step b) start c) stop d) final

69. What will be value of s from the following for c in range (1, 5)
s = s + c;
a) 5 b) 1 c) 15 d) 10

70. The following statements is an example of
Print ("ONE")
Print ("Four")
a) sequential b) iterative c) branching d) looping

71. How many keywords are there to achieve jump statements in python?
a) 3 b) 4 c) 2 d) 5

72. Which of the following statements are incorrect?
(i) Jump statements transfer the control from are part of the program to another conditionally.
(ii) goto, continue, pass are the three jump statements in python.
(iii) In Python, indentation is important in loop and other control statements.
(iv) Pass statement used as a place holder.
a) i and iv b) iii and iv c) ii and iii d) i and ii

73. Which part of the loop is not executed if a loop is left by break?
a) if b) for c) else d) break

74. The program statements executed for multiple times are called:
a) Sequential b) Looping c) Branching d) Iterative

75. Find the odd man out.
a) Keyword b) Statements c) Operator d) Identifier

76. Choose the incorrect statement:
a) A sequential statement is composed statements.
b) Simple if is the all decision making statements.
c) A loop allows to execute the statement one by one.
d) For loop is the most comfortable loop.

77. Pick the odd one out:
a) for b) while c) pass d) if... else

78. Which of the following optional part of while statement?
a) if b) else c) elif d) if-else

79. Pick the odd one out.
a) break b) for c) continue d) pass

80. Choose the correct statement.
a) Pass statement in python programming is a control statement.
b) Pass statement when executed by the interpreter it is completely ignored.
c) Pass statement is generally used as a stop the execution.
d) Pass statement can be used at the top of the program.

81. range() cannot take the values from _____.
a) string b) print c) list d) dictionary

82. Which is the optional part in range() function?
a) start b) stop c) step d) Incr

83. What is the output of the following snippet?
a) 12 b) 123 c) 1234 d) 124

84. If break statement is inside a nested loop, _____ will terminate the innermost loop.
a) continue b) break c) Pass d) goto

85. What types of Expressions can be given in the while loop?
a) Arithmetic b) logical c) relational d) Boolean

86. Match the following:

(i) for	-	(A) branching statement
(ii) while	-	(B) null statement
(iii) if... else	-	(C) looping statement
(iv) pass	-	(D) entry check loop

a) (i) C, (ii)- D, (iii) - A, (iv) - B b) (i) - C, (ii) - A, (iii) - B, (iv) - D
c) (iii)- B, (ii) - C, (iii) - A, (iv) - D d) (i) - B, (ii) - D, (iii) - A, (iv) - C

87. The end value of range(30, 3, -3) is _____.
a) 30 b) -3 c) 3 d) 6

88. Which of the following function generates the list of values starting from start till stop-1 ?
a) sequence() b) print() c) input() d) range()

89. Which of the following is not a jump statement in python?
a) break b) goto c) continue d) pass

90. Which of the following is not a nested loop?
a) Jump b) while c) for within if d) pass

91. Which parameter is used to specify any special characters?
a) ret b) let c) end d) sep

92. Which statement in python used to transfer the center from one part of the program to another unconditionally? a) iterative b) alternative c) loop d) Jump

93. _____ is used to come out of loop.
a) break b) for c) continue d) pass

94. A loop placed within another loop is called as _____.

95. If the condition is checked in the beginning of the loop, then it is called as _____ loop.
a) exit b) exit check c) entry check d) multiple

96. Which of the following is not a type of branching statements?
a) if b) while c) if-else d) if-elif

97. Checking whether the given number is even or odd can be done using
a) sequential b) iterative or sequential c) alternative or branching d) iterative or looping

98. _____ statement forces the next iteration to takes place.

a) break b) for c) continue d) pass

99. State whether the following statement is true/false.
(i) While loop is an entry check loop
(ii) for loop is an entry check loop
(iii) print( ) can have parameters
(iv) if-elif-else is similar to C++ nested if.
a) i-true, ii-true, iii-true, iv-true b) i-true, ii-true, iii-false, iv-true
c) i-true, ii-false, iii-true, iv-true d) i - true, ii - true, iii-true, iv-true

100. Choose the correct pair:
a) Branching - Alternative b) Sequencing - Jumping
c) Iteration - Sequencing d) Indentation – Nested

ANSWERS

1. a) if-else
2. d) b or c
3. else
4. a) iv only
5. a) Both A and R are true, And R is the correct explanation for A.
6. b) True
7. d) 2
8. a) loop
9. a) alternative
10. a) The syntax of range is range (start, step, stop)
11. a) for
12. b) :
13. d) pass - skipped statement
14. c) 0 to 19
15. 0 to 19
16. c) else
17. c) alternative statement also called branching
18. a) Programs
19. c) for
20. b) 2
21. d) decision making
22. a) continue
23. a) Statements
24. d) pass
25. If...else
26. a) Sequential
27. c) sequential
28. c) Relational or Logical expression
29. d) pass
30. c) 3
31. c) for within if
32. a) while
33. interpreter
34. b) Operator
35. c) 3
36. stop - 1
37. d) Break
38. d) continue
39. a) 1, 3, 5, 7
40. a) 2
41. b) elif
42. b) 0,2,4,6,8
43. d) Statements
44. a) for
45. b) branding
46. d) condition
47. break
48. a) while
49. Simple If
50. sequential statement
51. b) Condition
52. b) range ( )
53. c) end
54. a) while
55. c) control structure or control statement
56. d) both a and b
57. a) break
57. a) break
58. b) nested
59. b) range (1, 30, 1)
60. a) while
61. control structure
62. a) 3
63. d) n
64. c) else if
65. d) 30, 6
66. c) pass
67. a) iii and iv
68. a) step
69. b) 1
70. a) sequential
71. a) 3
72. d) i and ii
73. c) else
74. b) Looping
75. b) Statements
76. c) A loop allows to execute the statement one by one.
77. c) pass
78. b) else
79. b) for
80. b) Pass statement when executed by the interpreter it is completely ignored.
81. b) print
82. c) step
83. a) 12
84. b) break
85. d) Boolean
86. a) (i) C, (ii)- D, (iii) - A, (iv) - B
87. d) 6
88. d) range()
88. d) range()
89. b) goto
90. d) pass
91. d) sep
92. d) Jump
93. a) break
94. nested loop
95. c) entry check
96. b) while
97. c) alternative or branching
98. d) pass
99. d) i - true, ii - true, iii-true, iv-true
100. a) Branching - Alternative

PART-B

1 What is meant by alternative or branching?

There may be situations in our real life programming where we need to skip a segment or set of statements and execute another segment based on the test of a condition. This is called **alternative** or **branching**.

2 What is control structure or statement?

- A program statement that causes a jump of control from one part of the program to another is called **control structure** or **control statement.**
- The control statements are compound statements used to alter the control flow of the process or program depending on the state of the process.

3 List the control structures in Python.

The control structures in Python are:

- Sequential
- Alternative or Branching
- Iterative or Looping

4 What are the types of alternative or branching statements in Python?

Branching statements in Python are:

- Simple if statement
- if..else statement
- if..elif statement

5 What is sequential statement?

A sequential statement is composed of a sequence of statements which are executed one after another.

6 Define simple if statement.

Simple if is the simplest of all decision making statements. Condition should be in the form of relational or logical expression.

Syntax:

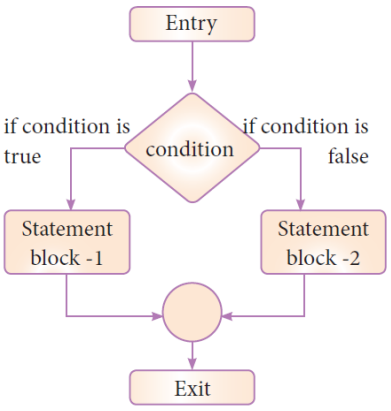
```
if <condition>:
statements-block1
```

7 Write is the syntax of if..else statement.

The syntax of 'if..else' statement:

```
if <condition>:
statements-block 1
else:
statements-block 2
```

8 Draw a flowchart that defines the execution of if-else statement.



9 Write a Program to check if the accepted number odd or even.

```
a = int(input("Enter any number :"))
```

```
if a%2==0:
print (a, " is an even number")
else:
print (a, " is an odd number")
```

Output 1:

```
Enter any number :56
56 is an even number
```

Output 2:

```
Enter any number :67
67 is an odd number
```

10 Write the syntax of alternative method to write complete if-else.

Syntax:

```
variable = variable1 if condition else variable 2
```

11 Write a Program to check if the accepted number is odd or even (using alternate method of if...else)

```
a = int (input("Enter any number :"))
x="even" if a%2==0 else "odd"
print (a, " is ",x)
```

Output 1:

```
Enter any number :3
3 is odd
```

Output 2:

```
Enter any number :22
22 is even
```

12 What are the two types of looping constructs in python?

- while loop
- for loop

13 What do you mean by Iteration or Loop?

- Iteration or loop are used in situation when the user need to execute a block of code several of times or till the condition is satisfied.
- A loop statement allows to execute a statement or group of statements multiple times.

14 Write a syntax for while loop.

Syntax:

```
while <condition>:
statements block 1
[else:
statements block2]
```

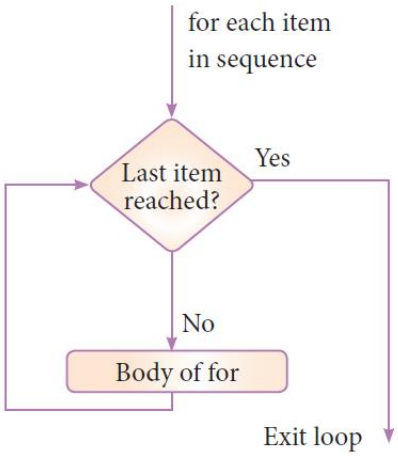
15 Write a program to illustrate the use of while loop - to print all numbers from 10 to 15.

```
i=10
while (i<=15):
print (i,end='\t')
i=i+1
```

Output:

```
10 11 12 13 14 15
```

16 Draw flow diagram to explain the working of 'for' statement



17 Write a program to illustrate the use of for loop - to print single digit even number.

```
for i in range (2,10,2):
print (i, end=' ')
```

Output:

2 4 6 8

18 What is meant by Nested loop structure?

- A loop placed within another loop is called as nested loop structure.
- One can place a **while** within another **while; for** within another **for; for** within **while** and **while** within **for** to construct such nested loops.

19 What is the use of Jump Statements in Python.

The jump statement in Python, is used to unconditionally transfer the control from one part of the program to another. There are three keywords to achieve jump statements in Python : **break, continue, pass.**

20 Define break statement.

- The **break** statement terminates the loop containing it. Control of the program flows to the statement immediately after the body of the loop.
- If break statement is inside a nested loop, break will terminate the innermost loop.

21 Define continue statement.

Continue statement unlike the break statement is used to skip the remaining part of a loop and start with next iteration.

22 Define pass statement.

- **pass** statement in Python programming is a null statement.
- pass statement when executed by the interpreter it is completely ignored.
- Nothing happens when pass is executed, it results in no operation.

23 Write note on range ( ) in loop.

range( ) generates a list of values starting from **start** till **stop-1**.

The syntax of range() is as follows:

range (start,stop,[step]) Where,

- start – refers to the initial value
- stop – refers to the final value
- step – refers to increment value, this is optional part.

24 Write a program to check the given number is an odd or even.

PROGRAM

```
a = int(input("Enter any number :"))
if a%2==0:
else:
print (a, " is an odd number")
```

Output 1:

Enter any number :56
56 is an even number

Output 2:

Enter any number :67
67 is an odd number

PART –C

1 Write a note on sequential statement with an example.

- A **sequential statement** is composed of a sequence of statements which are executed one after another.
- A code to print your name, address and phone number is an example of sequential statement.

Example:

```
print ("Hello! This is Shyam")
print ("43, Second Lane, North Car Street, TN")
```

Output

Hello! This is Shyam
43, Second Lane, North Car Street, TN

2 List the types of alternative or branching statement in python.

Python provides the following types of alternative or branching statements:
• Simple if statement • if..else statement • if..elif statement

3 Write a note on simple if statement with syntax and example.

Simple if statement

- Simple if is the simplest of all decision making statements.
- Condition should be in the form of relational or logical expression.

Syntax:

```
if <condition>:
statements-block1
```

In the above syntax if the condition is true statements - block 1 will be executed.

Example:

```
x=int (input("Enter your age :"))
if x>=18:
print ("You are eligible for voting")
```

Output 1:

Enter your age :34
You are eligible for voting

Output 2:

Enter your age :16
>>>

4 Write a note on if..else statement with syntax and example.

The **if .. else** statement provides control to check the true block as well as the false block. Following is the syntax of **'if..else'** statement.

Syntax:

```
if <condition>:
statements-block 1
else:
statements-block 2
```

Example:

```
a = int(input("Enter any number :"))
if a%2==0:
print (a, " is an even number")
else:
print (a, " is an odd number")
```

Output 1:

```
Enter any number :56
56 is an even number
```

Output 2:

```
Enter any number :67
67 is an odd number
```

5 What is the alternate method of if..else statement.

The complete **if..else** can also written as:

Syntax:

variable = variable1 if condition else variable 2

WORKING METHOD:

The condition specified in the if is checked, if it is true, the value of variable1 is stored in variable on the left side of the assignment, otherwise variable2 is taken as the value.

Example:

```
a = int (input("Enter any number :"))
x="even" if a%2==0 else "odd"
print (a, " is ",x)
```

Output 1:

```
Enter any number :3
3 is odd
```

Output 2:

```
Enter any number :22
22 is even
```

6 Write a program to illustrate the use of 'in' and 'not in' in if statement.

PROGRAM

```
ch=input ("Enter a character :")
if ch in ('a', 'A', 'e', 'E', 'i', 'I', 'o', 'O', 'u', 'U'):
print (ch,' is a vowel')
if ch not in ('a', 'b', 'c'):
print (ch,' the letter is not a/b/c')
```

7 Explain nested loop in Python

Nested loop structure

A loop placed within another loop is called as nested loop structure.

One can place:

- a **while** within another **while**
- **for** within another **for**
- **for** within **while** and
- **while** within **for** to construct such nested loops.

Example:

```
i=1
while (i<=6):
for j in range (1,i):
print (j,end='\t')
print (end='\n')
i +=1
```

OUTPUT:

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5.
```

8 Write a note on while loop with syntax and example.

The syntax of while loop in Python has the following syntax:

Syntax:

```
while <condition>:
statements block 1
[else:
statements block2]
```

In the **while** loop, the condition is any valid Boolean expression returning True or False. The **else** part of while is optional part of **while**. The **statements block1** is kept executed till the condition is True. If the **else** part is written, it is executed when the condition is tested False. Recall **while** loop belongs to entry check loop type, that is it is not executed even once if the condition is tested False in the beginning.

Example:

```
i=10
while (i<=15):
print (i,end='\t')
i=i+1
```

Output:

```
10 11 12 13 14 15
```

9 Write a program to display

A
A B
A B C
A B C D
A B C D E

PROGRAM:

```
a=['A','B','C','D','E']
for i in range(0,6):
for j in range(0,i):
print(a[j],end=" ")
else:
print()
```

10 List the differences between break and continue statements.

Break:

- The **break** statement terminates the loop containing it. Control of the program flows to the statement immediately after the body of the loop.
- If break statement is inside a nested loop, break will terminate the innermost loop.

Continue:

Continue statement unlike the break statement is used to skip the remaining part of a loop and start with next iteration.

11 Using if..else..elif statement write a suitable program to display largest of 3 numbers.

PROGRAM:

```
num1 = float(input("Enter first number: "))
num2 = float(input("Enter second number: "))
num3 = float(input("Enter third number: "))
if (num1 >= num2) and (num1 >= num3):
biggest = num1
elif (num2 >= num1) and (num2 >= num3):
biggest = num2
else:
biggest = num3
print("The biggest number between",num1,",",num2 ,"and",num3,"is",biggest)
```

PART D

1 Write a detail note on for loop.

for loop

- **for** loop is the most comfortable loop.
- It is also an entry check loop.
- The condition is checked in the beginning and the body of the loop is executed if it is only True otherwise the loop is not executed.

Syntax:

```
for counter_variable in sequence:
statements-block 1
[else: # optional block
statements-block 2]
```

- The counter_variable is the control variable of the loop and the sequence refers to the initial, final and increment value.
- In Python, **for** loop uses the range() function in the sequence to specify the initial, final and increment values.
- range() generates a list of values starting from **start** till **stop-1.**

The syntax of range() is as follows:

range (start,stop,[step])
Where,
start – refers to the initial value
stop – refers to the final value
step – refers to increment value, this is optional part.

Example:

```
for i in range(2,10,2):
print (i,end=' ')
else:
print ("\nEnd of the loop")
```

Output:

```
2 4 6 8
End of the loop
```

2 Write a detail note on if..else..elif statement with suitable example.

if..elif...else statement:

When we need to construct a chain of **if** statement(s) then **'elif'** clause can be used instead of **'else'.**

Syntax:

```
if <condition-1>:
    statements-block 1
elif <condition-2>:
    statements-block 2
else:
    statements-block n
```

- In the syntax of **if..elif..else** mentioned above, condition-1 is tested if it is true then statements-block1 is executed, otherwise the control checks condition-2, if it is true statements-block2 is executed and even if it fails statements-block n mentioned in **else** part is executed.
- **'elif'** clause combines **if..else-if..else** statements to one **if..elif...else.**
- **'elif'** can be considered to be abbreviation of **'else if'.**
- In an **'if'** statement there is no limit of **'elif'** clause that can be used, but an **'else'** clause if used should be placed at the end.

Example:

```
m1=int (input("Enter mark in first subject : "))
m2=int (input("Enter mark in second subject : "))
avg= (m1+m2)/2
if avg>=80:
print ("Grade : A")
```

```
elif avg>=70 and avg<80:
print ("Grade : B")
elif avg>=60 and avg<70:
print ("Grade : C")
elif avg>=50 and avg<60:
print ("Grade : D")
else:
print ("Grade : E")
```

Output 1:

```
Enter mark in first subject : 34
Enter mark in second subject : 78
Grade : D
```

Output 2 :

```
Enter mark in first subject : 67
```

3 Write a program to display all 3 digit odd numbers.

PROGRAM

```
for i in range(101,100,2):
print(i,end=" ")
```

4 Write a program to display multiplication table for a given number.

PROGRAM

```
n=int (input("Enter the number")
for i in range(1,13):
print(n,'x',i,"=",n*i)
```

5 Explain detail about jump statements in Python.

Jump Statements in Python

- The jump statement in Python, is used to unconditionally transfer the control from one part of the program to another.
- There are three keywords to achieve jump statements in Python : break, continue, pass.

Break statement

- The **break** statement terminates the loop containing it. Control of the program flows to the statement immediately after the body of the loop.
- If break statement is inside a nested loop (loop inside another loop), break will terminate the innermost loop.

Example:

```
for word in "Jump Statement":
if word = = "e":
break
print (word, end=")
else:
print ("End of the loop")
print ("\n End of the program")
```

Output:

```
Jump Stat
End of the program
```

continue statement

Continue statement unlike the break statement is used to skip the remaining part of a loop and start with next iteration.

Example:

```
for word in "Jump Statement":
if word = = "e":
continue
print (word, end=")
print ("\n End of the program")
```

Output:

Jump Statement
End of the program

pass statement.

- **pass** statement in Python programming is a null statement.
- pass statement when executed by the interpreter it is completely ignored.
- Nothing happens when pass is executed, it results in no operation.

Example:

```
a=int (input("Enter any number :"))
if (a==0):
pass
else:
print ("non zero value is accepted")
```

Output:

```
Enter any number :3
non zero value is accepted
```

1. Write a program to check whether the given character is a vowel or not.

PROGRAM

```
ch = input("Enter a character: ")
if(ch=='A' or ch=='a' or ch=='E' or ch =='e' or ch=='I'
or ch=='i' or ch=='O' or ch=='o' or ch=='U' or ch=='u'):
print(ch, "is a Vowel")
else:
print(ch, "is a Consonant")
```

2. Using if..else..elif statement check smallest of three numbers.

PROGRAM

```
a=in+(input("Enter number 1")
b=in+(input("Enter number 2")
c=in+(input("Enter number 3")
if a<b and a<c:
print("a is smallest")
elif b<a and b<c:
print("b is smallest")
else
print("c is smallest")
```

3. Write a program to check if a number is Positive, Negative or zero.

PROGRAM

```
num = float(input("Enter a number: "))
if num > 0:
print("Positive number")
elif num == 0:
print("Zero")
else:
print("Negative number")
```

4. Write a program to display Fibonacci series 0 1 1 2 3 4 5…… (upto n terms)

PROGRAM

```
f1 = -1
f2 = 1
n=int(input("Enter the number of terms "))
i = 1
while(i<=n):
f3=f1 + f2
print(f3,end=" ")
f1=f2
f2=f3
i = i + 1
```

5. Write a program to display sum of natural numbers, upto n.

PROGRAM

```
s=0
n=in+(input("Enter number of terms"))
for I in range(1,n+1)
s=s+i
print("sum=",s)
```

6. Write a program to check if the given number is a palindrome or not.

PROGRAM

```
n=int(input("Enter number:"))
temp=n
rev=0
while(n>0):
dig=n%10
rev=rev*10+dig
n=n//10
if(temp==rev):
print("The number is a palindrome")
else:
print("The number isn't a palindrome")
```

7. Write a program to print the following pattern

```
* * * * *
* * * *
* * *
* *
*
```

PROGRAM

```
n=int(input("Enter number of rows: "))
for i in range (n,0,-1):
print(i * ' * ' )
```

8. Write a program to check if the year is leap year or not.

PROGRAM

```
year=int(input("Enter year to be checked:"))
if(year%4==0 and year%100!=0 or year%400==0):
print("The year",year,"is a leap year")
else:
    print("The year",year,"is not a leap year")
```

9 Write a program in python to display the following output.

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

```
PROGRAM
i=1
while(i<6):
for j in range(1,i):
print(j,end='\t')
print(end='\n')
i=i+1
```

10 Write a program in python to display the following output.

```
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
```

```
PROGRAM
for i in range(1,6):
for j in range(1, i+1)
print(i,end=' ')
print(end='\n')
i=i+1
```

11 Write a program in python to display the following output.

```
5 5 5 5 5
4 4 4 4
3 3 3
2 2
1
```

```
PROGRAM
for i in range(5,0,-1):
for j in range(1, i+1)
print(i,end=' ')
print(end='\n')
i=i+1
```

12 Write a program in python to display the following output.

```
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
```

```
PROGRAM
for i in range(5,0,-1):
for j in range(1, i+1)
print(j,end=' ')
print(i,end='\n')
i=i+1
```

CHAPTER 7
PYTHON FUNCTIONS
PART A

Answer all the questions

1. A named blocks of code that are designed to do one specific job is called as
   a) Loop b) Branching c) Function d) Block
2. A Function which calls itself is called as
   a) Built-in b) Recursion c) Lambda d) return
3. Which function is called anonymous un-named function
   a) Lambda b) Recursion c) Function d) define
4. Which of the following keyword is used to begin the function block?
   a) define b) for c) finally d) def
5. Which of the following keyword is used to exit a function block?
   a) define b) return c) finally d) def
6. While defining a function which of the following symbol is used.
   a) ; (semicolon) b) . (dot) c) : (colon) d) $ (dollar)
7. In which arguments the correct positional order is passed to a function?
   a) Required b) Keyword c) Default d) Variable-length
8. Read the following statement and choose the correct statement(s).
   (I) In Python, you don't have to mention the specific data types while defining function.
   (II) Python keywords can be used as function name.
   a) I is correct and II is wrong b) Both are correct
   c) I is wrong and II is correct d) Both are wrong
9. Pick the correct one to execute the given statement successfully. if ____ : print(x, " is a leap year")
   a) x % 2 = 0 b) x % 4 = = 0 c) x/4 = 0 d) x % 4 = 0
10. Which of the following keyword is used to define the function testpython(): ?
    a) define b) pass c) def d) while
11. Which of the following is used, if you don't need to type all the python code for the same task again and again:
    a) Statement b) Control structures c) Function d) Scope
12. Which of the following avoids repetition and makes high degree of code reusing?
    a) Loop b) Branching c) Dictionaries d) Functions
13. Which of the following provides better modularity for your python application
    a) tuples b) function c) dictionaries d) control structures
14. How many types of functions are there in python?
    a) 4 b) 5 c) 3 d) 2
15. Functions that calls itself are known as
    a) User defined b) Lambda c) Recursive d) Built-in
16. Find the odd man out
    a) User defined b) Parameters c) Built in d) Recursion
17. Which of the following is not a type of function in python?
    a) Built in b) Recursion c) Lambda d) Control
18. In Python, statement in a block are written with
    a) Identification b) Recursion c) Function d) Parameters
19. Which of the following are treated as one big sequence of statement while exection?
    a) Structure b) Code c) Statement d) Block
20. What will be the output if the return has no argument?
    a) No b) None c) Return d) End
21. Which of the following are the values pass to the function parameters?
    a) Arguments b) Definitions c) Variables d) Identifiers
22. How many types of arguments are used to call a function ?
    a) 2 b) 5 c) 4 d) 3
23. Which of the following is not a type of arguments used to call a function?

a) Module b) Required c) Keywords d) Default

24. In which of the following the number of arguments in the function call should match exactly with the function definition?
a) Variable-length arguments b) Default arguments c) Required arguments d) Keyword arguments

25. In which of the following will invoke the functions after the parameters are recognized by their parameters names?
a) Required arguments b) Default arguments c) Keyword arguments d) Variable-length arguments

26. Which arguments are used when more arguments are passed that have already been specified?
a) Keyword b) Default c) Variable-length d) Required

27. Which of the following is used to define variable-length arguments?
a) // b) # c) $ d) *

28. Non-keyword variable arguments are called
a) Tuples b) List c) Dictionaries d) Arguments

29. Which of the following functions is an example that supports variable-length arguments?
a) Print ( ) b) While c) If d) Input( )

30. Which of the following keyword is used to define anonymous function ?
a) Def b) Lambda c) Range d) Alpha

31. Which function can take any number of arguments and must return one value in the form of an expression?
a) user defined b) recursive c) lambda d) default

32. Which function is mostly used for creating small and one time anonymous function?
a) Synchronous b) Built-in c) User-defined d) Lambda

33. Predict the output of the following code:
```
x = lambda y, z : y + z
print (10,15)
```
a) 15 b) 1025 c) 10 d) 25

34. Which of the following statement causes your function to exit?
a) return b) break c) print d) pass

35. How many return statement is executed at runtime?
a) 3 b) 2 c) 1 d) multiple

36. How many number of return statement allowed in a function definition?
a) only 2 b) only 4 c) multiple d) only one

37. Which of the following holds the current set of variables and their values?
a) functions b) operators c) Identifiers d) scope

38. How many types of scopes in Python?
a) 2 b) 4 c) 3 d) many

39. A _ with local scope can be accessed only within the block
a) integer b) keyword c) function d) variable

40. What is the output for the following code:
```
def loc( ) :
y = "2"
loc( )
print (y)
```
a) error b) loc( ) c) 2 d) y

41. Defining a variable outside a function, its _ by default.
a) local b) operands c) global d) function

42. Write the output for the following code:?
```
c = 1
def add( ):
c = c + 3
print (c)
add( )
```
a) 4 b) error c) 1 d) 3

43. Write the output for the following code
```
a = 5
```

```
def add( ):
a = 10
add ( )
print (a)
```
a) 10 b) 15 c) 5 d) error

44. Write the output for the following code:
```
a = 5
def add ( ):
a = 10
print (a)
add ( )
```
a) 10 b) 5 c) error d) 15

45. print (abs (-23.2)) displays
a) -23.2 b) 0.2 c) -23 d) 23.2

46. print (ord('A') displays
a) A b) a c) 97 d) 65

47. print (ord('a') displays
a) 97 b) 65 c) a d) c65

48. Print (chr(65)) displays
a) 65 b) a c) A d) c65

49. print (chr(43)) displays
a) a b) - c) A d) +

50. Print (bin(5)) displays
a) 0b101 b) 101 c) 1010b d) 5

51. Which function returns the ascii value for the Unicode character?
a) chr ( ) b) ascii ( ) c) ord ( ) d) type ( )

52. Which function is inverse of chr ( ) function?
a) type ( ) b) id ( ) c) formula ( ) d) ord ( )

53. Which function is an alternative to bin ( )?
a) format ( ) b) type ( ) c) id ( ) d) chr ( )

54. print (type ('a')) displays
a) < class ' bool '> b) < class ' slr '> c) < class ' char '> d) < class ' string '>

55. Which of the following function return the address of the object in memory?
a) address( ) b) object( ) c) format( ) d) id( )

56. print (format (25, '0') displays
a) 31 b) 031 c) 025 d) 25

57. The default presidium of fixed point constant
a) 7 b) 16 c) 8 d) 6

58. print (format (14, 'f') displays
a) 14.000000 b) 14.0000 c) 14.00 d) 14

59. print (round (17.89, 1) displays
a) 17.9 b) 18 c) 18.0 d) 181

60. pow (5, 2) is equivalent to
a) 5 * 2 b) 2 * 5 c) 5 * * 2 d) 2 * * 5

61. Which of the following function returns the computation of a * * b?
a) pow ( ) b) id ( ) c) format ( ) d) type ( )

62. Which of the following function returns the smallest integer greater than or equal to x?
a) ceil( ) b) floor( ) c) round( ) d) pow( )

63. Print (math.ceil (-23.2)) displays
a) -23 b) -24 c) -23:2 d) 23.2

64. The output of one function used as an argument for another function is called
a) Recursion b) Composition c) Built-in d) Decomposition

65. By default, python stops calling recursive function after
a) 1000 b) 5000 c) 100 d) 2000

66. _____ makes your program easier to write, read, test and fix errors.

a) Loops b) Tuples c) Functions d) List

67. A group of related statement that perform a specific task is called as _____ .
a) Functions b) Lists c) Control statements d) Tuples

68. Functions that are anonymous in named function are called _____
a) User defined b) Lambda c) Recursive d) Built-in

69. Function blocks begins with the keyword _____
a) Fun b) Definition c) Def d) Function

70. Functions identified by function name and _____
a) ( ) b) { } c) < > d) [ ]

71. Python _____ should not be used as function name.
a) Identifiers b) Operators c) Keywords d) Variables

72. While defining syntax, the text which is given in _____ is optional
a) ( ) b) [ ] c) < > d) { }

73. A block within a block is called _____ block.
a) Nested b) Compressed c) Control d) Called

74. If there is no return statement present inside the function, then the function will return _____ object. a) None b) Nothing c) No d) def

75. _____ of variable refers to the part of the program, where it is accessible.
a) argument b) return c) scope d) definition

76. A _____ variable declared inside the function's body is known as
a) file scope b) local scope c) function scope d) global scope

77. The _____ arguments are also local to function
a) default b) keyword c) variable-length d) format

78. helps us to define a program into _____ modules.
a) Functions b) Sub programs c) Routines d) Recursion

79. _____ are variables used in the function definition
a) Arguments b) Identifiers c) Structures d) Parameters

80. In _____ arguments, one can put arguments in improper order.
a) Default b) Variable length arguments c) Keyword d) Required

81. In python the _____ arguments is an arguments that takes a default values if no value is provide in function call
a) Variable length arguments b) Required c) Default d) Keyword

82. In variable length arguments we can pass the arguments using _____ methods.
a) Six b) Two c) Three d) Four

83. When a variable is created inside the _____, the variable becomes local to it.
a) function b) program c) global d) block

84. A _____ variable only exists while the function is executing.
a) global b) function c) file d) local

85. _____ function can only access global variables.
a) user-defined b) return c) recursive d) anonymous

86. In python _____ function is a function that is defined without a name.
a) Anonymous b) Recursive c) User defined d) Default

87. The _____ keyword used to read and write a global variable inside a function.
a) global b) local c) return d) def

88. The _____ function is inverse of ord( ) function.
a) id( ) b) chr( ) c) bin( ) d) none of these

89. _____ works like loop.
a) Function b) Specification c) Recursion d) Composition

90. You can convert any loop to _____.
a) Branching b) Function c) Composition d) Recursion

91. _____ is applied in any recursive function is known as base condition.
a) Finite iteration b) Infinite iteration c) Default arguments d) Keyword arguments

92. _____ function returns the largest integer less than or equal to x.
a) floor( ) b) cell( ) c) pow( ) d) round( )

93. In python, statements in a block are written with:

a) indentation b) keyword c) return d) colon

94. Which will be displayed as the last statement of the output, if the return has no argument?
a) True b) False c) None d) No

95. How many types of functions that arguments are used to call a function?
a) 2 b) 3 c) 4 d) 5

96. There are not specified in the function's definition which character is used to define such arguments? a) # b) * c) ! d) /

97. Which is called Non-keyword variable arguments?
a) tuples b) lambda c) return d) Recursion

98. Which function is return the ASCII value for the given character?
a) chr ( ) b) ord ( ) c) type ( ) d) format ( )

99. Pick the odd one out:
a) min ( ) b) max ( ) c) floor ( ) d) sum ( )

100. Which of the following provides better modularity for python program?
a) Function b) Statement c) Recursive

101. Which of the following statement exit a functions?
a) exit b) return c) pass d) continue

102. In python, statement in a block are written with:
a) Function b) Statement c) Identification d) Parameters

103. What will be the output if the return has no argument?
a) Exit b) Return c) Stop d) None

104. Which of the following are the values pass to the function parameters?
a) Identifier b) Variables c) Function d) Arguments

105. Which keyword is used to define anonymous function?
a) Def b) Alpha c) Gamma d) Lambda

106. Print (ord (A)), the output is:
a) 60 b) 62 c) 65 d) 66

107. Print (chr (43)), the output is:
a) + b) — c) / d) *

108. print (round(14.9)), the output is:
a) 14 b) 15 c) 14.9 d) 9

109. print (round (14.9657, 2)), the output will be as:
a) 14.9657 b) 14.2 c) 14.96 d) 14.57

110. What is output print(math.sqrt(100))?
a) 10.0 b) 100.0 c) 10.10 d) 10.22

111. Non-keyword variables arguments are called:
a) tuples b) list c) pairs d) Array

ANSWERS

1. c) Function	36. c) multiple	75. c) scope
2. b) Recursion	37. d) scope	76. b) local scope
3. a) Lambda	38. a) 2	77. d) format
4. d) def	39. b) keyword	78. a) Functions
5. b) return	39. b) keyword	79. d) Parameters
6. c) : (colon)	40. a) error	80. c) Keyword
7. d) Variable-length	41. c) global	81. c) Default
8. a) I is correct and II is wrong	42. b) error	82. b) Two
9. b) x % 4 = = 0	43. c) 5	83. a) function
10. c) def	44. a) 10	84. d) local
11. c) Function	45. d) 23.2	85. d) anonymous
12. d) Functions	46. d) 65	86. a) Anonymous
13. b) function	47. a) 97	87. a) global
14. a) 4	48. c) A	88. b) chr( )
15. c) Recursive	49. d) +	89. c) Recursion
16. b) Parameters	50. a) 0b101	90. d) Recursion

17. d) Control 18. a) Identification 19. d) Block 20. b) None 21. a) Arguments 22. c) 4 23. a) Module 24. c) Required arguments 25. b) Default arguments 26. c) Variable-length 27. d) * 28. a) Tuples 29. a) Print ( ) 30. b) Lambda 31. c) lambda 32. d) Lambda 33. d) 25 34. a) return 35. c) 1	51. c) ord ( ) 52. d) ord ( ) 53. a) format ( ) 54. b) < class ' slr '> 55. d) id( ) 56. a) 31 57. d) 6 58. a) 14.000000 59. a) 17.9 60. c) 5 * * 2 61. a) pow ( ) 62. a) ceil( ) 63. a) -23 64. b) Composition 65. a) 1000 66. c) Functions 67. a) Functions 68. b) Lambda 69. c) Def 70. a) ( ) 71. c) Keywords 72. b) [ ] 73. a) Nested 74. a) None	90. d) Recursion 91. b) Infinite iteration 92. a) floor( ) 93. a) indentation 94. c) None 95. c) 4 96. b) * 97. a) tuples 98. b) ord ( ) 99. c) floor ( ) 100. a) Function 101. b) return 102. c) Identification 103. d) None 104. d) Arguments 105. d) Lambda 106. c) 65 107. a) + 108. b) 15 109. c) 14.96 110. a) 10.0 111. a) tuples

PART B

1. What is function?

Functions are named blocks of code that are designed to do specific job.

2. Write the different types of function.

User-defined functions - Functions defined by the users themselves.
Built-in functions - Functions that are inbuilt with in Python.
Lambda functions - Functions that are anonymous un-named function.
Recursion functions - Functions that calls itself is known as recursive.

3. What are the main advantages of function?

- It avoids repetition and makes high degree of code reusing.
- It provides better modularity for your application.

4. What is meant by scope of variable? Mention its types.

- Scope of variable refers to the part of the program, where it is accessible, i.e., area where you can refer (use) it.
- We can say that scope holds the current set of variables and their values.
- We will study two types of scopes - **local scope** and **global scope**.

5. Define global scope.

- A variable, with global scope can be used anywhere in the program.
- It can be created by defining a variable outside the scope of any function/block.

6. What is base condition in recursive function

- When a function calls itself is known as recursion. Recursion works like loop but sometimes it makes more sense to use recursion than loop. You can convert any loop to recursion.
- A recursive function calls itself. Imagine a process would iterate indefinitely if not stopped by some condition! Such a process is known as infinite iteration.
- The condition that is applied in any recursive function is known as base condition. A base condition is must in every recursive function otherwise it will continue to execute like an infinite loop.

7. How to set the limit for recursive function? Give an example.

- print(fact (2000)) will give Runtime Error maximum recursion depth exceeded in comparison.
- This happens because python stops calling recursive function after 1000 calls by default.

- It also allows you to change the limit using sys.setrecursionlimit (limit_value).

Example:

```
import sys
sys.setrecursionlimit(3000)
def fact(n):
if n == 0:
return 1
else:
return n * fact(n-1)
print(fact (2000))
```

8. How the statements in a black are written in python?

In Python, statements ina block are written are written with indentation

9. What is meant by block in python?

A block is one or more lines of code, grouped together so that they are treated as one big sequence of statements while execution.

10. How the nested block are indented?

A block within a block is called nested block. When the first block statement is indented by a single tab space, the second block of statement is indented by double tab spaces.

11. Write the output of the following program.

```
def hello():
print ("hello - Python")
return
print (hello())
```

Output:

```
hello – Python
None
```

12. Differentiate parameters and arguments.

Parameters are the variables used in the function definition whereas arguments are the values we pass to the function parameters

13. Write the syntax for passing arguments to functions.

def function_name (parameter(s) separated by comma):

14. Write the output for the following program.

```
def area(w,h):
return w * h
print (area (3,5))
```

Output:

15

15. What are arguments? What are the types?

Arguments are used to call a function and there are primarily 4 types of functions that one can use: Required arguments, Keyword arguments, Default arguments and Variable-length arguments.

16. Write the syntax of variable length arguments.

```
def function_name(*args):
function_body
return_statement
```

17. What are the methods used to parse the arguments to the variable length arguments?

In Variable Length arguments we can pass the arguments using two methods.

1. Non keyword variable arguments
2. Keyword variable arguments

18. What are called tuples?

Non-keyword variable arguments are called **tuples**.

19. What is anonymous function or lambda function?

- In Python, anonymous function is a function that is defined without a name.

- While normal functions are defined using the **def** keyword, in Python anonymous functions are defined using the **lambda** keyword. Hence, anonymous functions are also called as **lambda** functions.

20. How the value returned from lambda function?

Lambda function can take any number of arguments and must return one value in the form of an expression

21. Write the output for the following program.

```
sum = lambda arg1, arg2: arg1 + arg2
print ('The Sum is :', sum(30,40))
print ('The Sum is :', sum(-30,40))
```

Output:

```
The Sum is : 70
The Sum is : 10
```

22. Write a note on return statement syntax.

return [expression list]

This statement can contain expression which gets evaluated and the value is returned. If there is no expression in the statement or the return statement itself is not present inside a function, then the function will return the None object.

23. What is local variable?

A variable declared inside the function's body or in the local scope is known as local variable.

24. Write the output for the following.

(i) Print (ord ('a'))
(ii) Print (chr (65))
(iii) Print (bin (15))
(iv) Print (format (15, 'b'))

Output:

(i) 97
(ii) A
(iii) ob 1111
(iv) 1111

PART C

1. Write the rules of local variable.

- A variable with local scope can be accessed only within the function/block that it is created in.
- When a variable is created inside the function/block, the variable becomes local to it.
- A local variable only exists while the function is executing.
- The formate arguments are also local to function.

2. Write the basic rules for global keyword in python.

- When we define a variable outside a function, it's global by default. You don't have to use global keyword.
- We use global keyword to read and write a global variable inside a function.
- Use of global keyword outside a function has no effect

3. What happens when we modify global variable inside the function?

```
c = 1 # global variable
def add():
c = c + 2 # increment c by 2
print(c)
add()
```

Output:

Unbound Local Error: local variable 'c' referenced before assignment

4. Differentiate ceil() and floor() function?

ceil()	floor()
Returns the smallest integer greater than or equal to x	Returns the largest integer less than or equal to x
Syntax: math.ceil (x)	Syntax: math.floor (x)

5. Write a Python code to check whether a given year is leap year or not.

```
y=int(input("Enter year")
if y%4==0:
print ("The given year is a leap year")
else:
print ("The given year is not a leap year")
```

6. What is composition in functions?

- The value returned by a function may be used as an argument for another function in a nested manner. This is called composition.
- For example, if we wish to take an expression as a input from the user, we take the input string from the user using the function input() and apply eval() function to evaluate its value.

7. How recursive function works?

When a function calls itself is known as recursion.

How recursive function works:

- Recursive function is called by some external code.
- If the base condition is met then the program gives meaningful output and exits.
  Otherwise, function does some required processing and then calls itself to continue recursion.

8. What are the points to be noted while defining a function?

- When defining functions the following things that need to be noted;
- Function blocks begin with the keyword **"def"** followed by function name and parenthesis ().
- Any input parameters or arguments should be placed within these parentheses when you define a function.
- The code block always comes after a colon (:) and is indented.
- The statement **"return [expression]"** exits a function, optionally passing back an expression to the caller.
- A **"return"** with no arguments is the same as return None.

9. When do you call the function to perform a specify task?

- When you want to perform a particular task that you have defi ned in a function, you call the name of the function responsible for it.
- If you need to perform that task multiple times throughout your program, you don't need to type all the code for the same task again and again; you just call the function dedicated to handling that task, and the call tells Python to run the code inside the function.

9. Write the advantages of user - defined functions.

- Functions help us to divide a program into modules. This makes the code easier to manage.
- It implements code reuse. Every time you need to execute a sequence of statements, all you need to do is to call the function.
- Functions, allows us to change functionality easily, and different programmers can work on different functions.

10. Write a note on "Required arguments".

- **"Required Arguments"** are the arguments passed to a function in correct positional order.
- Here, the number of arguments in the function call should match exactly with the function definition.
- Atleast one parameter to prevent syntax errors to get the required output.

```
def printstring(str):
print ("Example - Required arguments ")
print (str) return
# Now you can call printstring() function
printstring("Welcome")
```

Output:

Example - Required arguments
Welcome

11. How will you invoke the function after the parameters are recognized by their parameter names? Explain with an example.

- Keyword arguments will invoke the function after the parameters are recognized by their parameter names.
- The value of the keyword argument is matched with the parameter name and so, one can also put arguments in improper order (not in order).

Example:

```
def printdata (name):
print ("Example-1 Keyword arguments")
print ("Name :",name)
return
printdata(name = "Gshan")
```

When the above code is executed, it produces the following output :

Output:

Example-1 Keyword arguments
Name :Gshan

12. How python takes a default value in the function call? Explain with an example.

- In Python the default argument is an argument that takes a default value if no value is provided in the function call.
- The following example uses default arguments, that prints default salary when no argument is passed.

Example:

```
def printinfo( name, salary = 3500):
print ("Name: ", name)
print ("Salary: ", salary)
return
printinfo("Mani")
```

When the above code is executed, it produces the following output

Output:

Name: Mani
Salary: 3500

When the above code is changed as print info("Ram",2000) it produces the following output:

Output:

Name: Ram
Salary: 2000

13. When the variable - length arguments are used? Explain with an example.

Syntax - Variable-Length Arguments

```
def function_name(*args):
function_body
return_statement
def printnos (*nos):
for n in nos:
print(n)
return
# now invoking the printnos() function
print ('Printing two values')
printnos (1,2)
print ('Printing three values')
printnos (10,20,30)
```

Output:

Printing two values

1

2

Printing three values

10

20

30

14. Write a note of return statement.

- The return statement causes your function to exit and returns a value to its caller. The point of functions in general is to take inputs and return something.
- The return statement is used when a function is ready to return a value to its caller. So, only one return statement is executed at run time even though the function contains multiple return statements.
- Any number of 'return' statements are allowed in a function definition but only one of them is executed at run time.

15. What is the use of global keyword? Explain with an example?

Changing Global Variable From Inside a Function using global **keyword**

```
x = 0 # global variable
def add():
global x
x = x + 5 # increment by 2
print ("Inside add() function x value is :", x)
add()
print ("In main x value is :", x)
```

Output:

```
Inside add() function x value is : 5
In main x value is : 5
```

16. Explain with an example how will you use global and local variables in the same code.

Using Global and Local variables in same code

```
x=8 # x is a global variable
def loc():
global x
y = "local"
x = x * 2
print(x)
print(y)
loc()
```

Output:

```
16
local
```

17. Explain how will you use global and local variable with same name.

Global variable and Local variable with same name

```
x = 5
def loc():
x = 10
print ("local x:", x)
loc()
print ("global x:", x)
```

Output:

```
local x: 10
```

global x: 5

18. Write a note on format( ) with an example.

format ( ) :

Returns the output based on the given format

- Binary format. Outputs the number in base 2.
- Octal format. Outputs the number in base 8.
- Fixed-point notation. Displays the number as a fixed-point number. The default precision is 6.

Syntax:

format (value [, format_ spec])

Example:

```
x= 14
y= 25
print ('x value in binary :',format(x,'b'))
print ('y value in octal :',format(y,'o'))
print('y value in Fixed-point no ',format(y,'f '))
```

Output:

x value in binary : 1110

y value in octal : 31

y value in Fixed-point no : 25.000000

19. Write a note on (i) min(), (ii) max(), (iii) sum().

min ( )	Returns the minimum value in a list.	min (list)	MyList = [21,76,98,23] print ('Minimum of MyList :', min(MyList)) **Output:** Minimum of MyList : 21
max ( )	Returns the maximum value in a list.	max (list)	MyList = [21,76,98,23] print ('Maximum of MyList :', max(MyList)) **Output:** Maximum of MyList : 98
sum ( )	Returns the sum of values in a list.	sum (list)	MyList = [21,76,98,23] print ('Sum of MyList :', sum(MyList)) **Output:** Sum of MyList : 218

20. Write a note on (i) floor(), (ii) ceil(), (iii) Sprt().

floor ( )	Returns the largest integer less than or equal to x	math.floor (x)	x=26.7 y=-26.7 z=-23.2 print (math.floor (x)) print (math.floor (y)) print (math.floor (z)) **Output:** 26 -27 -24

ceil ( )	Returns the smallest integer greater than or equal to x	math.ceil (x)	x= 26.7 y= -26.7 z= -23.2 print (math.ceil (x)) print (math.ceil (y)) print (math.ceil (z)) **Output:** 27 -26 -23
sqrt ( )	Returns the square root of x Note: x must be greater than 0 (zero)	sqrt (x)	a= 30 b= 49 c= 25.5 print (math.sqrt (a)) print (math.sqrt (b)) print (math.sqrt (c)) **Output:** 5.477225575051661 7.0 5.049752469181039

PART D

1. Explain the different types of function with an example.

We can divide functions into the following types:

- User-defined Functions
- Built-in Functions
- Lambda Functions
- Recursion Functions

User-defined function:

Functions defined by the users themselves.

Syntax for User defined function:

```
def <function_name ([parameter1, parameter2…] )> :
<Block of Statements>
return <expression / None>
```

Example:

```
def printinfo( name, salary = 3500):
print (“Name: “, name)
print (“Salary: “, salary)
return
printinfo(“Mani”)
```

Output:

```
Name: Mani
Salary: 3500
```

Built-in functions:

Functions that are inbuilt within Python are called built-in functions.

abs ()	Returns an absolute value of a number. The argument may be an integer or a floating point number.	abs (x)	x=20 y= -23.2 print('x = ', abs(x)) print('y = ', abs(y)) **Output:** x = 20 y = 23.2

Lamda functions

Functions that are anonymous un-named function are called as Lamda functions.

In Python, anonymous function is a function that is defined without a name. While normal functions are defined using the def keyword, in Python anonymous functions are defined using the lambda keyword. Hence, anonymous functions are also called as lambda functions.

A recursive function

A recursive function calls itself. Imagine a process would iterate indefinitely if not stopped by some condition! Such a process is known as infinite iteration. The condition that is applied in any recursive function is known as base condition. A base condition is must in every recursive function otherwise it will continue to execute like an infinite loop.

2. Explain the scope of variables with an example.

- Scope of variable refers to the part of the program, where it is accessible, i.e., area where you can refer (use) it.
- There are two types of scopes - **local scope** and **global scope**.

Local Scope :

A variable declared inside the function's body or in the local scope is known as local variable.

Rules of local variable

- A variable with local scope can be accessed only within the function/block that it is created in.
- When a variable is created inside the function/ block, the variable becomes local to it.
- A local variable only exists while the function is executing.
- The formate arguments are also local to function.

Example

```
def loc():
y=0 # local scope
print(y)
loc()
```

Output:

0

Global Scope :

- A variable, with global scope can be used anywhere in the program.
- It can be created by defining a variable outside the scope of any function/block.

Rules of global Keyword

The basic rules for **global** keyword in Python are:

- When we define a variable outside a function, it's global by default. You don't have to use global keyword.
- We use global keyword to read and write a global variable inside a function.
- Use of global keyword outside a function has no effect

Example:

```
x = 0 # global variable
def add():
global x
x = x + 5 # increment by 2
print ("Inside add() function x value is :", x)
add()
```

```
print ("In main x value is :", x)
```

Output:

```
Inside add() function x value is : 5
In main x value is : 5
```

3. Explain the following built-in functions.

(a) id()
(b) chr()
(c) round()
(d) type()
(e) pow()

id ( )	id( ) Return the "identity" of an object. i.e. the address of the object in memory. **Note:** the address of x and y may differ in your system.	**id (object)**	x=15 y='a' print ('address of x is :',id (x)) print ('address of y is :',id (y)) **Output:** address of x is : 1357486752 address of y is : 13480736
chr ( )	Returns the Unicode character for the given ASCII value. This function is inverse of ord() function.	chr (i)	c=65 d=43 print (chr (c)) prin t(chr (d)) **Output:** A +
round ( )	Returns the nearest integer to its input. 1. First argument (number) is used to specify the value to be rounded.	round (number [,ndigits])	x= 17.9 y= 22.2 z= -18.3 print ('x value is rounded to', round (x)) print ('y value is rounded to', round (y)) print ('z value is rounded to', round (z))
type ( )	Returns the type of object for the given single object. **Note:** This function used with single object parameter.	type (object)	x= 15.2 y= 'a' s= True print (type (x)) print (type (y)) print (type (s)) **Output:** <class 'float'> <class 'str'> <class 'bool'>

pow ()	Returns the computation of ab i.e. (a**b) a raised to the power of b.	pow (a, b)	a=5 b=2 c=3.0 print (pow (a,b)) print (pow (a,c)) print (pow (a+b,3)) Output: 25 125.0 343

4. Write a Python code to find the L.C.M. of two numbers.

```
def lcm(x, y):
if x > y:
greater = x
else:
greater = y
while(True):
if((greater % x == 0) and (greater % y == 0)):
lcm = greater
break
greater += 1
return lcm
num1 = int(input("Enter first number: "))
num2 = int(input("Enter second number: "))
print("The L.C.M. of", num1,"and", num2,"is", lcm(num1, num2))
```

5. Explain recursive function with an example.

Recursive function

- When a function calls itself is known as recursion.
- A recursive function calls itself.
- The condition that is applied in any recursive function is known as base condition.
- A base condition is must in every recursive function otherwise it will continue to execute like an infinite loop.

Overview of how recursive function works

- Recursive function is called by some external code.
- If the base condition is met then the program gives meaningful output and exits.
- Otherwise, function does some required processing and then calls itself to continue recursion.

Example:

```
def fact(n):
if n == 0:
return 1
else:
return n * fact (n-1)
print (fact (0))
print (fact (5))
```

Output:

```
1
120
```

6. Explain different types arguments used in python with an example.

There are four types of function arguments. They are

Required arguments
Keyword arguments
Default arguments
Variable-length arguments

Required Arguments:

- **"Required Arguments"** are the arguments passed to a function in correct positional order.
- Here, the number of arguments in the function call should match exactly with the function definition.
- Atleast one parameter to prevent syntax errors to get the required output.

```
def printstring(str):
print ("Example - Required arguments ")
print (str) return
# Now you can call printstring() function
printstring("Welcome")
```

Output:

```
Example - Required arguments
Welcome
```

Keyword Arguments :

- Keyword arguments will invoke the function after the parameters are recognized by their parameter names.
- The value of the keyword argument is matched with the parameter name and so, we can also put arguments in improper order.

Example:

```
def printdata (name):
print ("Example-1 Keyword arguments")
print ("Name :",name)
return
printdata(name = "Gshan")
```

Output:

```
Example-1 Keyword arguments
Name :Gshan
```

Default Arguments :

In Python the default argument is an argument that takes a default value if no value is provided in the function call.

Example:

```
def printinfo( name, salary = 3500):
print ("Name: ", name)
print ("Salary: ", salary)
return
printinfo("Mani")
```

Output

```
Name: Mani
Salary: 3500
```

Variable-Length Arguments :

In some instances we need to pass more arguments than have already been specified. Variable-Length arguments can be used for that purpose. These are not specified in the function's definition and an asterisk (*) is used to define such arguments.

Example:

```
def printnos(*nos)
```

```
for n in nos:
print(n)
return
print('Printing two values')
printnos(1,2)
print('Printing three values')
printnos(10,20,30)
```

Output

```
Printing two values
1
2
Printing three values
10
20
30
```

2. Try the following code in the above program

```
def printinfo( name, salary = 3500):
print ("Name: ", name)
print ("Salary: ", salary)
return
```

SI.No	Code	Result
1	printinfo("3500")	
2	printinfo("3500""Sri")	
3	printinfo(name = balu")	
4	printinfo("Jose",1234)	
5	printinfo("",salary =1234)	

RESULT:

1.
Name: 3500
Salary: 3500
2.
Name: 3500
Salary: Sri
3.
Name: balu
Salary: 3500
4.
Name: Jose
Salary: 1234
5.
Name:
Salary: 1234

3. Evaluate the following functions and write the output

SI.No	Function	Output
1	eval('25*2-5*4')	
2	math.sqrt(abs(-81))	
3	math.ceil(3.5+4.6)	
4	math.floor(3.5+4.6)	

OUTPUT

1. 30
2. 9.0
3. 9
4. 8

4. Evaluate the following functions and write the output

SI.No	Function	Output
1	1) abs(-25+12.0)	
	2) abs(-3.2)	
2	1) ord('2')	
	2) ord('$')	
3	type('s')	
4	bin(16)	
5	1) chr(13)	
	2) print(chr(13))	
6	1) round(18.2,1)	
	2) round(18.2,0)	
	3) round(0.5100,3)	
	4) round(0.5120,3)	
7	1) format(66, 'c')	
	2) format(10, 'x')	
	3) format(10,'X')	
	4) format(0b110, 'd')	
	5) format(0xa, 'd')	
8	1) pow(2,-3)	
	2) pow(2,3.0)	
	3) pow(2,0)	
	4) pow((1+2),2)	
	5) pow(-3,2)	
	6) pow(2*2,2)	

OUTPUT

1. 1) 3.0
2)3.2
2. 1) 50
2) 36
3. <class 'str'>
4. '0b10000'
5. 1)'\r'
2) blank line
6. 1) 18.2
2) 18.0
3) 0.51
4) 0.512
7. 1) 'B'
2) 'a'
3) 'A'
4) '6'
5) '10'
8. 1) 0.125
2) 8.0
3) 1
4) 9

5) 9
6) 16

CHAPTER 8
STRINGS AND STRING MANIPULATIONS
PART A

1. Which of the following is the output of the following python code?
str1 = "TamilNadu"
print(str1[::-1])
a) Tamilnadu b) Tmlau c) udanlimaT d) udaNlimaT
2. What will be the output of the following code?
str1 = "Chennai Schools"
str1[7] = "-"
a) Chennai-Schools b) Chenna-School c) Type error d) Chennai
3. Which of the following operator is used for concatenation?
a) + b) & c) * d) =
4. Defining strings within triple quotes allows creating:
a) Single line Strings b) Multiline Strings c) Double line Strings d) Multiple Strings
5. Strings in python:
a) Changeable b) Mutable c) Immutable d) flexible
6. Which of the following is the slicing operator?
a) { } b) [ ] c) < > d) ( )
7. What is stride?
a) index value of slide operation b) first argument of slice operation
c) second argument of slice operation d) third argument of slice operation
8. Which of the following formatting character is used to print exponential notation in upper case?
a) %e b) %E c) %g d) %n
9. Which of the following is used as placeholders or replacement fields which get replaced along with format( ) function?
a) { } b) < > c) ++ d) ^^
10. The subscript of a string may be:
a) Positive b) Negative c) Both (a) and (b) d) Either (a) or (b)
11. Which of the following is used to handle array of characters in python?
a) Functions b) Composition c) Arguments d) String
12. String are enclosed with
a) " b) """ """ c) ''' ''' d) All of these
13. Which of the following allows creation of multiline strings
a) ''' ''' b) """ """ c) " " d) ' '
14. Find the output for the following.
print ('Greater Chennai cooperation's student')
a) Error : Invalid Syntax b) Greater Chennai Corporation's student
c) S Student d) Greater Chennai Corporation
15. String index values are also called as
a) class b) function c) subscript d) arguments
16. Which of the following is used to access and manipulate the strings?
a) Index value b) Subscript c) Argument d) a or b
17. The positive subscript always starts with
a) 1 b) 0.1 c) 0 d) -1
18. The negative subscript is always begins with
a) -1.0 b) -1 c) 0 d) 1
19. What is the output for the following.
>>> s1 = "how"
>>>s1 [0] = 'A'
a) How b) Error c) A d) Aow
20. Which of the following operators are useful to do string manipulation?
a) + * b) ; " c) *, / d) +, -

21. Adding more strings at the end of an existing string is known as
a) Append b) Con cat c) Join d) Con catenation
22. A substring can be taken from the original string by using
a) { } b) < > c) ( ) d) [ ]
23. What is the output from the following statement?
str1 = "welcome"
print (str1[: : 3])
a) ome b) wce c) come d) wel
24. What is the output from the following statement?
str1 = "python"
print (str1 [: : -21)
a) nhy b) Pyt c) hy d) on
25. Which of the following operator is used to construct strings?
a) : b) : : c) % d) #
26. Which of the following formatting operator is used to represent signed decimal integer?
a) %s or %e b) %g or %x c) %s or %c d) %d or %i
27. Escape sequences starts with a
a) / b) // c) \" d) \
28. What is Escape sequence character for the description character with octal value?
a) \OHH b) \OOO c) /OOO d) /OHH
29. Which of the following is used as a place holders which get replaced along with format function?
a) { } b) ( ) c) < > d) [ ]
30. The function returns the length of the string in python is
a) strlrn ( ) b) length ( ) c) leng ( ) d) len ( )
31. What will be the output of print (len("CHENNAI"))?
a) 7 b) 9 c) 8 d) Error
32. capitalize the first character of the string?
a) captial ( ) b) capitalize ( ) c) capitalizefirst ( ) d) firstcapital ( )
33. The function used to search the first occurrence of the substring In the given string is
a) search ( ) b) searchstring ( ) c) find ( ) d) find string ( )
34. What is the output for the following? 'mammals'. find ('ma')
a) 3 b) -1 c) 1 d) 0
35. What is the output for the following? 'mammals'. find ('ma',2)
a) -1 b) 3 c) 0 d) 1
36. What is the output for the following? 'mammals' find ('ma', 2, 4)
a) -1 b) 0 c) 3 d) 1
37. What is the output for the following? 'mammals'. find ('ma', 2, 5)
a) 1 b) 0 c) -1 d) 3
38. Which function returns the number of sub strings occurs within the given range?
a) count ( ) b) substring ( ) c) range ( ) d) return( )
39. The default value of stride is
a) -0 b) 1 c) -1 d) 0
40. _____is a combination of letters, numbers or special symbols enclosed with. ", " " or '" '"
a) Function b) Scope of variable c) String d) Parameters
41. In python _____ are immutable.
a) String b) Characters c) Functions d) Numbers
42. When a string is define(d) Python allocate an _____ for its each character.
a) Function b) Parameter c) Index value d) Arguments value
43. The subscript can be _____ integer numbers.
a) Positive b) Negative c) Floating d) Positive or negative
44. Python provides a function _____ to change all occurrences of a particular character in a string. a) replace( ) b) change( ) c) change all( ) d) replace all( )
45. In Python, the entire string variable removed using _____ command
a) Remove b) Delete c) Replace d) Del
46. The _____operator is used to append a new string with an excisting string.

a) + b) * = c) + = d) * *

47. The _____ operator is used to display a string in multiple number of time.
a) + + b) * c) * * d) + =

48. _____ is a substring of a mainstring.
a) slice b) concat c) append d) stride

49. Write the missing symbol in the following statement.
str [start _____ end]
a) : b) , c) : : d) ;

50. The formatting operator _____ is used to replacing parts of strings with the data stored in variables. a) % b) # c) : d) : :

51. The _____ function is a powerful function used for formatting strings.
a) format ( ) b) string ( ) c) Slice ( ) d) format string ( )

52. The 'in' and 'not in ' operators are called as _____ operators.
a) string b) string formatting c) reference d) membership

53. Choose the correct pair from the following.
a) % d - unsigned decimal integer. b) % i - signed decimal integer
c) % x - octal integer. d) % 0 - short number in floating point

54. Choose the correct pair from the following.
a) \a - Aarriage Return b) \b – Backspace c) \v - Value ooo d) \f - Formfeed

55. Choose the incorrect pair from the following.
a) % u - unsigned decimal integer b) % G - short numbers in exponential notation
c) % d - signed decimal integer d) % e - exponential notation

56. Choose the incorrect pair from the following.
a) \n - line feed b) \f - Form feed c) \b - Backspace d) \h - Horizontal tab

57. Choose the incorrect pair from the following.
a) 'Save earth '. Capitalize ( ) - Save earth b) 'Earth '. Snap case ( ) - eARTH
c) 'Save earth'. Title( ) - Save Earth d) 'EARTH'. Lower ( ) - earth

58. Choose the incorrect statement from the following.
(i) String is not a data type in python
(ii) Strings are enclosed with single, double or triple quotes.
(iii) Strings are not immutable.
(iv) Strings cannot be changed during execution.
a) i and iii b) i and ii c) i, iii and iv d) only iii

59. Which of the following is incorrect statement?
(i) In Python, string are immutable.
(ii) Python allow to modify the already defined string.
(iii) Python will not allow deleting a particular character in string.
(iv) In Python, the index value is only a positive integer.
a) i and iii b) ii and iii c) ii and iv d) i, ii and iv

60. Match the following:

(i) % i	-	(1) short number in exponential form
(ii) % 0	-	(2) exponential notation
(iii) % G	-	(3) signed decimal integer
(iv) % X	-	(4) octal integer
(v) % E	-	(5) hexadecimal integer

a) (i) - 3; (ii) - 1; (iii) - 4, (iv) - 5; (v) - 2 b) (i) - 3; (ii) - 4; (iii) - 1; (iv) - 5; (v) - 2
c) (i) - 3; (ii) - 4; (iii) - 1; (iv) - 2; (v) - 5 d) (i) - 3; (ii) - 4; (iii) - 5; (iv) - 1; (v) - 2

61. Match the following:

(i) \a	-	(1) line feed
(ii) \b	-	(2) Backspace
(iii) \f	-	(3) Horizontal Tab
(iv) \n	-	(4) Bell
(v) \t	-	(5) Form feed

a) (i) - 4; (ii) - 2; (iii) - 5; (iv) - 1; (v) - 3 b) (i) - 4; (ii) - 2; (iii) - 5; (iv) - 3; (v) - 1
c) (i) - 2; (ii) - 4; (iii) - 5; (iv) - 3; (v) - 1 d) (i) - 2; (ii) - 4; (iii) - 1; (iv) - 3; (v) - 5

62. Which is the first positive character assigned to the subscript?
a) 0 b) 1 c) 2 d) 3
63. Which is the last positive character assigned to the subscript?
a) n b) n2 c) n-1 d) 1-n
64. Which operator is used to append new string with an existing string?
a) ++ b) += c) /= d) *=
65. Which multiplication operator is used to display a string is multiple number of times?
a) x b) ** c) * d) ^
66. What is the output?
>>> strl= "GOOD"
>>> print (str1[0])
a) G b) GO c) GOO d) Null
67. Which is the string formatting operator?
a) // b) \\ c) % d) &
68. Which is the Hexadecimal character formatting character?
a) %H b) %X c) %d d) %e
69. Escape sequences starts with a:
a) / b) \ c) % d) //
70. Which escape sequences is used for carriage return?
a) \c b) \f c) \r d) \t
71. Which is the output of >>> print(ord(`B'))?
a) 65 b) 66 c) 67 d) 68
72. What is the output of >>> print (chr (97)) ?
a) a b) A c) b d) B
73. Which command is used to remove entire string variable?
a) era b) del c) ctrl+D d) Alt+D
74. Match the following:
(i) + - (A) Slicing operator
(ii) += - (B) Repeating operator
(iii) * - (C) Append
(iv) [ ] - (D) Concatenation
a) (i) - D, (ii) - B, (iii) - A, (iv) - C b) (i) - D, (ii) - C, (iii) - B, (iv) - A
c) (i)- c, (ii)- B, (iii) - A, (iv) - D d) (i) - C, (ii) - D, (iii) - A, (iv) - B
75. Match the following:
(i) % c - (A) decimal integer
(ii) % d - (B) character
(iii) % x - (C) Floating point integer
(iv) %f - (D) Hexadecimal integer
a) (i)- B, (ii) - A, (iii) - D, (iv) - C b) (i) - B, (ii) - C, (iii) - D, (iv) - A
c) (i) - C, (ii) - D, (iii) - A, (iv) - B d) (i) - C, (ii) - D, (iii) - B, (iv) - A
76. Match the following:
(i) /a - (A) AscII carriage return
(ii) \b - (B) AscII Bell
(iii) \n - (C) AscII Backspace
(iv) \r - (D) AscII Linefeed
a) (i)- B, (ii) - D, (iii) - A, (iv) - C b) (i)- B, (ii) - C, (iii) - D, (iv) - A
c) (i)- c, (ii)- D, (iii) - A, (iv) - B d) (i) - C, (ii)- A, (iii) - B, (iv) - D
77. Choose the incorrect statement:
a) len (str) is returns the length of the string.
b) Capitalize ( ) function is used to capitalize the all the character of the string.
c) isalpha ( ) is returns only letters.
d) isdigit ( ) is returns only numbers.
78. Pick the odd one out:
a) lower ( ) b) upper ( ) c) title ( ) d) format ( )
79. Choose the incorrect pair:

a) % - Formatting operator b) % u - unsigned decimal integer
c) % i - unsigned integer d) % e - exponential notation

80. Assertion (A): Usually python does not support any modification in its strings.
Reason (R): But, it provides a function replace ( ) to change all occurrences of a particular character in a string.
a) Both A and R are True, And R is the Correct explanation for A.
b) Both A and R are True, But R is not the correct explanation for A.
c) A is True, But R is false. d) A is False, But R is True.

81. Assertion (A):The string formatting operator is one of the most exciting feature in python.
Reason (R). The formatting operator + is used to construct strings with the data stored in variables.
a) Both A and R are True, And R is the Connect explanation for A.
b) Both A and R are True, But R is not the correct explanation for A.
c) A is True, But R is false. d) A is False, But R is True.

82. Choose the incorrect pair:
a) %o - octal integer b) %e - decimal integer c) %f - exponential d) %g - character

83. Choose the correct pair:
a) \t - horizontal tab b) \v - form feed c) \ooo- octal value d) \a - new line

84. Choose the incorrect statement:
a) Slice is a substring of a main string. b) The slicing operator is &.
c) The default value of stride is 0. d) We cannot use negative value as a stride.

85. Choose the correct statement:
a) String is a sequence of numbers. b) String is a data type in Python.
c) String is enclosed with only single quote. d) Python string are mutable.

86. The default value of stride is:
a) 0 b) 1 c) 3 d) 5

87. Which is first negative value assigned to the subscript?
a) 0 b) 1 c) -1 d) n-2

88. The default value of string is:
a) 0 b) -1 c) 1 d) Nothing

ANSWERS

1. d) udaNlimaT
2. a) Chennai-Schools
3. a) +
4. b) Multiline Strings
5. c) Immutable
6. b) [ ]
7. d) third argument of slice operation
8. a) %e
9. a) { }
10. d) Either (a) or (b)
11. d) String
12. d) All of these
13. b) """ """
14. a) Error : Invalid Syntax
15. c) subscript
16. d) a or b
17. c) 0
18. b) -1
19. b) Error
20. a) + *
21. a) Append
22. d) [ ]
23. b) wce
38. a) count ( )
38. a) count ( )
39. b) 1
40. c) String
41. a) String
42. c) Index value
43. d) Positive or negative
44. a) replace( )
45. d) Del
46. c) + =
47. b) *
48. a) slice
49. a) :
50. a) %
51. a) format ( )
52. d) membership
53. b) % i – signed decimal integer
54. b) \b - Backspace
55. c) % d – signed decimal integer
56. d) \h – Horizontal tab
57. a) 'Save earth '. Capitalize ( ) – Save earth
71. a) 65
72. b) A
73. b) del
74. b) (i) - D, (ii) - C, (iii) - B, (iv) - A
75. a) (i)- B, (ii) - A, (iii) - D, (iv) - C
76. b) (i)- B, (ii) - C, (iii) - D, (iv) - A
77. b) Capitalize ( ) function is used to capitalize the all the character of the string.
78. d) format ( )
79. c) % i – unsigned integer (a) % Formatting operator (b) % u unsigned decimal integer (c) % i unsigned integer (d) % e exponential notation
80. a) Both A and R are True, And R is the Correct explanation for A.
81. c) A is True, But R is false.
82. a) %o – octal integer
83. a) \t – horizontal tab
84. a) Slice is a substring of a

24. a) nhy 25. c) % 26. d) %d or %i 27. d) \ 28. b) \OOO 29. a) { } 30. d) len ( ) 31. a) 7 32. b) capitalize ( ) 33. c) find ( ) 34. d) 0 35. b) 3 36. a) -1 37. d) 3	58. a) i and iii 59. c) ii and iv 60. b) (i) - 3; (ii) - 4; (iii) - 1; (iv) - 5; (v) - 2 61. a) (i) - 4; (ii) - 2; (iii) - 5; (iv) - 1; (v) - 3 62. a) 0 63. c) n-1 64. b) += 65. c) * 66. a) G 67. c) % 68. b) %X 69. b) \ 70. b) \f	main string. 85. b) String is a data type in Python. 86. b) 1 87. c) -1 88. c) 1

PART B

1. What is String?

String is a data type in python, which is used to handle array of characters.
String is a sequence of Unicode characters that may be a combination of letters, numbers, or special symbols enclosed within single, double or even triple quotes.

Example:

'Welcome to learning Python'
"Welcome to learning Python"
''' "Welcome to learning Python" '''

2. Do you modify a string in Python?

- Strings in python are immutable.
- Once we define a string modifications or deletion is not allowed.
- If we want to modify the string, a new string value can be assign to the existing string variable.

3. How will you delete a string in Python?

We can remove entire string variable using del command.

Example:

```
>>> str1="How about you"
>>> print (str1)
How about you
>>> del str1 # string str1 is deleted now
```

4. What will be the output of the following python code?

```
str1 = "School"
print(str1*3)
```

Output:

School School School

5. What is slicing?

- Slice is a substring of a main string.
- A substring can be taken from the original string by using [ ] operator and index or subscript values.
- [ ] is known as slicing operator. Using slice operator, we have to slice one or more substrings from a main string.

6. How will you manipulate the strings?

- Once you define a string, python allocate an index value for its each character.
- These index values are otherwise called as subscript which are used to access and manipulate the strings.
- The subscript can be positive or negative integer numbers.

7. What it means "String in phython are immutable"?

- strings in python are immutable.

- That means, once you define a string modifications or deletion is not allowed.

8. Write a python a program to print your name 10 times.

```
str1=input("Enter your name")
print(str1*10)
```

9. Write the output for the following if strl = "THIRIKKURAL"

(i) print (str1 [0])
(ii) print (str1 [0:5])
(iii) print (str1 [:5])
(iv) Print (str1 [6:])

Output:
(i) T
(ii) THIRU
(iii) THIRU
(iv) KURAL

10. Write the general format of slice operation.

str[start:end]

Where **start** is the beginning index and **end** is the last index value of a character in the string. Python takes the end value less than one from the actual index specified.

11. What has to be filled in the blank to get the following output

(i) Welcome python
(ii) Welcome to learn python
From
(a) print ("Welcome" _____"Python")
str1 = "Welcome"
(b) print (Str1 _____"to learn python")

Ans:
(a) +
(b) +=

12. Write a program to print the following output

C
CO
COM
COM
COMP
COMPU
COMPUT
COMPUTE
COMPUTER

Ans:

```
Str1="COMPUTER"
Index=0
for i in str1:
print(str1[:index+1])
index+=1
```

13. What is meant by stride?

When the slicing operation, you can specify a third argument as the stride, which refers to the number of characters to move forward after the first character is retrieved from the string. The default value of stride is 1.

14. if str1 = "Welcome to learn python", then write the output for the following.

(i) print (str1 [10 : 16])
(ii) print (str1 [10 : 16 : 4])
(iii) print (str1 [10 : 16 : 2])
(iv) print (str1 [: : 3])

Ans:
(i) Learn

(ii) r
(iii) er
(iv) ceoenyo

15. Write the output for the following statement.

```
str1 = "Welcome to learn python"
print (str1 [: : - 2])
```

Output:
nhy re teolW

16. What is the use of formatting operator?

- The string formatting operator is one of the most exciting feature of python.
- The formatting operator % is used to construct strings, replacing parts of the strings with the data stored in variables.

17. Write a note on the function center ( ).

center(width, fillchar)	Returns a string with the original string centered to a total of width columns and filled with fillchar in columns that do not have characters	>>> str1="Welcome"
		>>> print(str1.center(15,'*'))
		******Welcome******

18. What is the use of find ( ) function? Explain with an example.

find(sub[, start[, end]])	The function is used to search the first occurrence of the sub string in the given string. It returns the index at which the substring starts. It returns -1 if the substring does not occur in the string.	>>>str1='mammals' >>>str1.find('ma') **0** **On omitting the start parameters, the function starts the search from the beginning.** >>>str1.find('ma',2) 3 >>>str1.find('ma',2,4) -1 **Displays -1 because the substring could not be found between the index 2 and 4-1.** >>>str1.find('ma',2,5) 3

19. Write the output for the following statement.

(i) print ("save earth" . title ( ))
(ii) print ("Save Earth" . swapcase ( ))
Output:
(i) Save Earth
(ii) sAVE eARTH

20. Differentiate lower ( ) and is lower ( ).

lower( )	Returns the exact copy of the string with all the letters in lowercase.	>>>str1='SAVE EARTH' >>>print(str1.lower()) **save earth**
islower( )	Returns True if the string is in lowercase.	>>> str1='welcome' >>>print (str1.islower( )) **True**

21. Differentiate upper ( ) and is upper ( ).

isupper( )	Returns True if the string is in uppercase.	>>> str1='welcome' >>>print (str1.isupper( )) **False**
upper( )	Returns the exact copy of the string with all letters in uppercase.	>>> str1='welcome' >>>print (str.upper( )) **WELCOME**

22. What is the use of title ( ) function? Give example.

title( )	Returns a string in title case	>>> str1='education department'
		>>> print(str1.title())
		Education Department

23. What is known as Accessing characters in a string?

- Once you define a string, python allocate an index value for its each character.
- These index values are otherwise called as subscript which are used to access and manipulate the strings.
- The subscript can be positive or negative integer numbers.

24. What is replace () and write its syntax?

replace() to change all occurrences of a particular character in a string.

General formate of replace function:

replace("char1", "char2")

25. What is meant by string concatenation?

Joining of two or more strings is called as Concatenation. The plus (+) operator is used to concatenate strings in python.

Example

```
>>> "welcome" + "Python"
'welcomePython'
```

26. What is known as string formatting operators?

- The string formatting operator is one of the most exciting feature of python.
- The formatting operator % is used to construct strings, replacing parts of the strings with the data stored in variables.

Syntax:

("String to be display with %val1 and %val2" %(val1, val2))

27. Short note on Escape sequences in python.

- Escape sequences starts with a backslash and it can be interpreted differently.
- When you have use single quote to represent a string, all the single quotes inside the string must be escaped.
- Similar is the case with double quotes.

28. What are called membership operators?

The '**in**' and '**not in**' operators can be used with strings to determine whether a string is present in another string. Therefore, these operators are called as Membership Operators.

PART C

1. Write a Python program to display the given pattern

C O M P U T E R
C O M P U T E
C O M P U T
C O M P U
C O M P
C O M
C O
C

PROGRAM

```
str="COMPUTER"
index=len(str)
for i in str:
```

```
print (str[:index])
index -=1
```

2. Write a short about the followings with suitable example:
(a) capitalize( ) (b) swapcase( )
(a) capitalize( ) function:
It is used to capitalize the first character of the string.
Example:

```
>>> city = “chennai”
>>> print(city.capitalize())
```

Output

```
Chennai
```

swapcase( ) function:
It is change case of every character to its opposite case vice-versa.
Example:

```
>>>str=”tAmilNaDu”
>>>print(str.swapcase())
```

Output:

```
TaMILnAdu
```

3. What will be the output of the given python program?

```
str1 = "welcome"
str2 = "to school"
str3=str1[:2]+ str2[len(str2) - 2:]
print(str3)
```

OUTPUT

```
weol
```

4. What is the use of format( )? Give an example.

- The format( ) function used with strings is very versatile and powerful function used for formatting strings.
- The curly braces { } are used as placeholders or replacement fields which get replaced along with format( ) function.

Example:

```
num1=int (input(“Number 1: “))
num2=int (input(“Number 2: “))
print (“The sum of { } and { } is { }”.format(num1, num2,(num1+num2)))
```

Output

```
Number 1: 34
Number 2: 54
The sum of 34 and 54 is 88
```

5. Write a note about count( ) function in python.

count(str, beg, end)	Returns the number of substrings occurs within the given range. Remember that substring may be a single character. Range (beg and end) arguments are optional. If it is not given, python searched in whole string. Search is case sensitive.	>>> str1="Raja Raja Chozhan"
		>>> print(str1.count('Raja'))
		2
		>>> print(str1.count('r'))
		0
		>>> prin**t(str1.count('R'))**
		2
		>>> print(str1.count('a'))
		5
		>>> print(str1.count('a',0,5))
		2
		>>> print(str1.count('a',11))
		1

6. Write a python program to find the length of a string.

```
str=input("Enter a string")
print(len(str))
```

7. Write a program to count the occurrences of each word in a given string.

```
word=1
str=input("Enter a string")
for i in str:
if(i==' '):
word=word+1
print("Number of words",word)
```

8. Write a program to add a prefix text to all the lines in a string.

```
import  a
str1=input("enter string")
t=a.dedent(str)
w=a.fill(t,width=50)
f=a.indent(w,1*1)
print()
print(f)
print()
```

9. Write a program to print integers with '*' on the right of specified width.

```
num = int (input("Enter a three digit number"))
print("Given Number: ", num)
print("Formatted Number"+"{:*< 7d}".format(num));
print()
```

10. Write a program to create a mirror of the given string. For example, "wel" = "lew".

```
str1=input("enter a string")
str2=' '
index=-1
for i in str1:
str2=str1[index]
index-=1
print("The mirror image of the string is",str2)
```

11. Write a program to removes all the occurrences of a give character in a string.

```
def replace(str, char):
return str.replace(char, "")
s = input("Enter a string ")
c =input('Enter character to replace in the string ')
print("String after replacement",replace(s,c))
```

12. Write a program to append a string to another string without using += operator.

```
s = " ";
s1=input("Enter first string ")
s2=input("Enter second string ")
s3=input("Enter third string ")
seq = (s1, s2, s3);
print (s.join( seq))
```

13. Write a program to swap two strings.

```
str1 = input("Enter First String ")
str2 = input("Enter Second String ")
print("Strings before swap ")
print("String1 is ",str1)
print("String2 is ",str2)
str1,str2=str2,str1;
print("Strings after swap ")
print("String1 is ",str1)
print("String2 is ",str2)
```

14. Write a program to replace a string with another string without using replace().

```
str1=input("Enter string")
print(str1)
str1=input("enter string to the replaced")
print(str1)
```

15. Write a program to count the number of characters, words and lines in a given string.

```
str1=input("enter  string")
c=0
w=1
for i in str1:
if i!= ' ':
c=c+1
else:
w=w+1
x=str1.count('\n')+1
print("Number of characters", c-x+1)
print("Number of words",w+x-1)
print("Number of lines",x)
```

PART D

1. Explain about string operators in python with suitable example.

String Operators

Python provides the following operators for string operations. These operators are useful to manipulate string.

(i) Concatenation (+)

- Joining of two or more strings is called as Concatenation.
- The plus (+) operator is used to concatenate strings in python.

Example

```
>>> "welcome" + "Python"
'welcomePython'
```

(ii) Append (+ =)

- Adding more strings at the end of an existing string is known as append.
- The operator += is used to append a new string with an existing string.

Example

```
>>> str1="Welcome to "
>>> str1+="Learn Python"
>>> print (str1)
Welcome to Learn Python
```

(iii) Repeating (*)

The multiplication operator (*) is used to display a string in multiple number of times.

Example

```
>>> str1="Welcome "
>>> print (str1*4)
Welcome Welcome Welcome Welcome
```

(iv) String slicing

Slice is a substring of a main string. A substring can be taken from the original string by using [ ] operator and index or subscript values. Thus, [ ] is also known as slicing operator. Using slice operator, you have to slice one or more substrings from a main string.

Example : slice a single character from a string

```
>>> str1="THIRUKKURAL"
>>> print (str1[0])
T
```

(v) Stride when slicing string

When the slicing operation, you can specify a third argument as the stride, which refers to the number of characters to move forward after the first character is retrieved from the string. The default value of stride is 1.

Example

```
>>> str1 = "Welcome to learn Python"
>>> print (str1[10:16])
learn
>>> print (str1[10:16:4])
r
>>> print (str1[10:16:2])
er
>>> print (str1[::3])
Wceoenyo
```

2. Write a python program to check whether the given string is palindrome or not.

```
str1 = input ("Enter a string: ")
str2 = ' '
index=-1
for i in str1:
str2 += str1[index]
index -= 1
print ("The given string = { } \n The Reversed string = { }".format(str1, str2))
if (str1==str2):
print ("Hence, the given string is Palindrome")
else:
print ("Hence, the given is not a palindrome")
```

3. Write a python program to print the following pattern

```
*
**
***
****
*****
```

```
str1='*'
i=1
while i<=5:
print(str1*i)
i+=1
```

4. Write a python program to display the number of vowels and consonants in the given string.

```
str1=input ("Enter a string: ")
str2="aAeEiIoOuU"
v,c=0,0
for i in str1:
if i in str2:
v+=1
else:
c+=1
print ("The given string contains { } vowels and { } consonants".format(v,c))
```

5. Write a python program to create an Abecedarian series, (Abecedarian refers list of elements appear in alphabetical order).

```
str1="ABCDEFGH"
str2="ate"
for i in str1:
print ((i+str2),end='\t')
```

Output

Aate Bate Cate Date Eate Fate Gate Hate

CHAPTER 9
LISTS, TUPLES, SETS AND DICTIONARY
PART A

1. Which of the following operator is used to join two sets in python?
   a) & b) ^ c) | d) %
2. _____ is used to separate the elements in the dictionary.
3. What is the output for the following? (a,b) = (34)
   a) a = 34 b) Error c) b = 34 d) a = 34, b = 34
4. Choose the correct pair from the following:
   a) List = { } b) Tuple = ( ) c) Set = [ ] d) Dictionary = ( )
5. Choose the incorrect statement:
   a) A list is simply created by using curly brackets.
   b) Nested list containing another list as an element.
   c) Python assigns automatic index value.
   d) Index value of a list begins with zero.
6. The key value pair are enclosed with:
   a) [] b) {} c) () d) All of these
7. To access the list elements in reverse order, _____ value have to be given.
   a) 0 b) positive c) imaginary d) negative
8. Which of the following can be used to access a particular element in a dictionary?
   a) [ ] b) < > c) { } d) ( )
9. _____ function deletes the element using the given index value.
10. In list, the positive index number always begin with _____
    a) One b) -1 c) 0.0 d) Zero
11. _____ is used to access an element in a list.
    a) element b) i c) index d) tuple
12. What is a powerful feature in python assignment?
    a) Tuple Assignment b) List Assignment c) pair Assignment d) Assignment statement
13. What is output?
    m = list(range(0, 5, 2))
    a) [2,4] b) [0,2,4] c) [1,3,5] d) [0,3,5]
14. Python return _____ value from a function
    a) Only One b) Only Two c) Only Three d) More than are
15. In python, _____ is an integer number which can be positive or negative.
    a) Identifier b) Keyword c) Index value d) Operators
16. Which of the following can be used to access a particular element in a dictionary?
    a) [] b) {} c) () d) <>
17. How many argument used in the range function?
    a) 4 b) 3 c) 2 d) Only one
18. Assertion (A): In python, each value of a list is called as element.
    Reason (R): It can be of any type such as numbers, characters, strings and even the nested lists.
    a) Both A and R are true and R is the correct explanation for A.
    b) Both A and R are •true but R is not the correct explanation for A.
    c) A is true, but R is false. d) A is false, but R is true.
19. Which function is used to add a single element to an existing list?
    a) add( ) b) append( ) c) extend( ) d) addlist( )
20. _____ returns copy of the list.
21. _____are used to access all elements from a list.
    a) Branching b) Loops c) Alternative d) Functions
22. What is the output for the following??
    a = {1, 2, 2, 3}
    print (a)

a) {1, 2} b) {1, 2, 3} c) {1, 2, 2, 3} d) {1, 2, 2}

23. Predict the output for the following.
mylist = [34, 45, 48]
print(mylist. append (90))
a) 34, 45, 90, 48 b) 48, 45, 90, 34 c) 90, 34, 45, 48 d) 34, 45, 48, 90

24. Choose the incorrect pair:
a) remove ( ) - delete element b) pop ( ) - delete index value
c) clear ( ) - delete all element d) del ( ) - delete single element

25. When you try to print the list which is already cleared, _____ is display without any elements.

26. Tuples are enclosed with _____
a) < > b) [ ] c) ( ) d) { }

27. Which of the following is enclosed with {}?
a) List b) Key value pairs c) Tuple d) Dictionary

28. Which is true related to sets?
a) mutable b) unordered c) No duplicates d) All are true

29. list = [34, 45, 48]
list.extend([71, 32, 29]) results in _____.

30. A list or tuple can be converted as set by using _____ function.
a) List( ) b) Tuple( ) c) Setlt( ) d) Set( )

31. Match the following:
(i) range (1) - (A) 5
(ii) range(5,6) - (B) 3
(iii) range(1,4,2) - (C) 1
(iv) range (1,1+1) - (D) 0
a) (i)-D, (ii) - A, (iii) - B, (iv) - C b) (i)- D, (ii) - B, (iii) - C, (iv) - A
c) (i)- B, (ii) - D, (iii) -C, (iv) - A d) (i)- B, (ii) - C, (iii) - A, (iv) - D

32. The _____ function deletes and returns the last element of a list if the index is not given?
a) pop( ) b) del( ) c) remove( ) d) push( )

33. What is the output from the following?
li = ['T', 'E', 'C', 'M']
for i in li:
print (li [1])
a) E b) M c) C d) T

34. Which of the following is a simplest way of creating sequence of elements that satisfy certain condition?
a) Tuple comprehension b) Dictionary c) List comprehension d) Set comprehension

35. Find the correct statement from the following.
a) when new element is inserted in the list, the existing elements shift one position to the right
b) when a new element is inserted in the list, the existing element shifts one position to the left
c) none of these

36. What is output?
>>> marks = [10,23,41,75]
>>> print (marks[-1])
a) 10 b) 23 c) 75 d) 41

37. A list in python is denoted by _____.
a) [] b) {} c) <> d) #

38. Which function is used to add more than one element in an existing list?
a) append () b) add () c) extend () d) insert ()

39. Choose the correct pair:
a) union - more sets b) intersection - two but not one
c) difference - common sets d) symmetric - first set

40. Choose the incorrect statement:
a) Python has four collection of data types. b) A list is a numeric constant.
c) Each value list is called as element. d) The elements can be modified or replaced.

41. Identify the correct statement.

a) The dictionary type stores a index along with its element
b) The dictionary type stores a key along with its element
c) none of these

42. Find the wrong tuple.
a) mytup = (10) b) mytup = (10) c) print(tup[:]) d) tup(10, 20)

43. The function _____ is used to join to sets in python.
a) Union( ) b) Join( ) c) Join set( ) d) Set( )

44. Choose the incorrect statement:
a) Python enables reverse or negative indexing list.
b) Python negative lists index in sequence order.
c) Python sets —1 as the index value for the last element.
d) Loops are used to access all elements.

45. Match the following:
(i) del ( ) - (A) delete unknown element
(ii) remove ( ) - (B) delete known element
(iii) pop ( ) - (C) delete only elements
(iv) clear ( ) - (D) delete and returns
a) (i)- B, (ii) - C, (iii) - D, (iv) - A b) (i)- B, (ii) - A, (iii) - D, (iv) - C
c) (i)- D, (ii)- A, (iii) - B, (iv) - C d) (i) - D, (ii) - C, (iii) - B, (iv) - A

46. The _____ function in python is used to find the length of a list.
a) lenlist( ) b) length( ) c) len( ) d) listlength( )

47. Which of the following command deletes only the elements in the list?
a) clear( ) b) remove( ) c) del( ) d) pop( )

48. Which is the symmetric difference operator?
a) + b) - c) ^ d) &

49. (x,y) = (3**2, 15%2)
print(x,y) gives the answer _____.
a) 6 1 b) 6 7 c) 9 1 d) 9 7

50. How many ways to delete element from a list?
a) 2 b) 3 c) 4 d) 5

51. To delete an entire tuple, _____ command is used.
a) del b) delete c) clear d) remove

52. Which one of the following is the tuple assignment operator?
a) += b) = c) == d) *=

53. Choose the correct pair:
a) list - immutable b) Tuple – mutable c) dictionary - mixed d) group - single

54. The key value pairs are enclosed with _____.
a) < > b) [] c) {} d) ()

55. A tuple defined in another tuple is called as _____.

56. a = ['A', 2, 3, [4, 5, 6]] is an example of
a) Tuple b) Set c) List d) Dictionary

57. _____ statement deletes the entire list.

58. Which function is used to generate a series of values in Python?
a) pop ( ) b) range ( ) c) len ( ) d) count ( )

59. Pick the odd one with deleting elements from a list.
a) del b) remove() c) pop() d) clear

60. Which of the following operator can be used to alter the range of elements in the list?
a) = = b) : c) : : d) =

61. Match the following:
(i) index from - (A) Upper limit
(ii) index to - (B) Add single
(iii) append ( ) - (C) Add more
(iv) extend ( ) - (D) Lower limit
a) (i)- B, (ii) - D, (iii) - C, (iv) - A b) (i)- B, (ii) - C, (iii) - A, (iv) - D
c) (i)- D, (ii) - C, (iii) - A, (iv) - B d) (i)- D, (ii) - A, (iii) - B, (iv) - C

62. In li = [10, 23, 41, 75], the negative index value of 41 is
a) -3 b) 2 c) -1 d) -2

63. Pick the odd one out:
a) copy () b) count () c) index () d) tuple ()

64. Assertion (A): The Insert ( ) is used to insert an element at any position of a list.
Reason (R): Python is used to add more elements in a list.
a) Both A and R are true and R is the correct explanation for A
b) Both A and R are true but R is not the correct explanation for A.
c) A is true, but R is false. d) A is false, but R is true.

65. Which of the following function is used to add more than one element in an existing list?
a) addlist( ) b) extend( ) c) append( ) d) add( )

66. Which key is separated by python dictionary?
a) , b) . c) : d) ::

67. Pick the odd one out:
a) Dictionary b) Union c) Intersection d) Symmetric

68. Which operator is used to join two tuples?
a) - b) _ c) + d) +:

69. Match the following:

(i) list	-	(A) from list
(ii) Tuple	-	(B) mixed
(iii) set	-	(C) element
(iv) dictionary	-	(D) unordered

a) (i) - c, (ii)- A, (iii)- B, (iv) - D b) (i)- C, (ii)- A, (iii) - D, (iv) - B
c) (i)- B, (ii) - D, (iii) - A, (iv) - C d) (i)- B, (ii) - C, (iii) - A, (iv) - D

70. Which of the following statement is used to delete an element from the list?
a) Remove b) Case c) Delete d) Del

71. Which of the following datatype enclosed with [ ]?
a) Tuples b) Set c) Dictionary d) List

72. Iterating _____ is faster than list.
a) Tuples b) List c) Set d) Dictionary( )

73. Match the following:

i. ^	-	1. Intersection
ii. |	-	2. Difference
iii. &	-	3. Union
iv. -	-	4. Symmetric difference

a) (i) - 4; (ii) - 3; (iii) - 1; (iv) - 2 b) (i) - 2; (ii) - 3; (iii) - 1; (iv) - 4
c) (i) - 4; (ii) - 1; (iii) - 3; (iv) - 2 d) (i) - 1; (ii) - 4; (iii) - 3; (iv) - 2

74. If reverse is set as True, list sorting is in
a) ascending order b) descending order c) no sorting d) multiple sorting

75. Assertion (A): Python assign an automatic index value for each element of list begin with zero.
Reason (R): Positive value of index counts from the end of the list.
a) Both A and R are true and R is the correct explanation for A.
b) Both A and R are true but R is not the correct explanation for A.
c) A is true, but R is false. d) A is false, but R is true.

76. Find the statement which is wrong. When you assign a value to the key.
a) it will be appended b) it will overwrite the old data c) none of these

77. Choose the incorrect pair:
a) Positive index - Beginning onwards b) Negative index - Reverse order
c) List - Initial value 1 d) Tuples - Similar to list

78. The _____ com can be used to delete an entire tuple
a) deletetuple b) remove c) del d) delete

79. The _____ function is used to create list in python.

80. _____ assignment is a powerful feature in python.

81. Which function can be used to delete an element using the given index value?
a) del ( ) b) clear ( ) c) pop ( ) d) remove ( )

82. The keys in a python dictionary is separated by a _____
a) , b) : c) :: d) ;
83. A set is created using
a) [ ] b) ( ) c) {( )} d) { }
84. Match the following:
(i) Union - (A) -
(ii)intersection - (B) |
(iii) difference - (C) ^
(iv) symmetric - (D) &
a) (i)- B, (ii) - D, (iii) - A, (iv) - C b) (i) B, (ii) - A, (iii) - C, (iv) - D
c) (i)- C, (ii)- D, (iii) - A, (iv) - B d) (i) - C, (ii) - A, (iii) - B, (iv) - D
85. Which of the following function is used to delete only are element from a list?
a) pop( ) b) delete( ) c) del d) clear( )
86. In a nested tuple, each tuple is considered as a (n) _____
a) Function b) Set c) Tuple d) List
87. _____ consists of a number of values separated by comma and enclosed within parenthesis.
a) list b) tuples c) dictionary d) sets
88. Which part is optional in dictionary comprehension?
a) If b) expression c) var d) sequence
89. Which of the following function used to include multiple element in the list?
a) append( ) b) endlist( ) c) extend( ) d) insert( )
90. Fill up the blank. dellist [index from _____ index to]
a) ; b) . c) :: d) :
91. Choose the incorrect pair:
a) Set - Data type b) Index from - Beginning index
c) Index to - Upper limit d) Dictionary - Numeric constant
92. The two ways of deleting elements from a list are _____ and _____.
93. Which are used to access all elements from a list?
a) loop b) statements c) function d) none of these
94. Which operator joins two sets?
a) + b) | c) || d) &
95. Choose the incorrect pair from the following:
a) List = [ ] b) Dictionary = { } c) Tuple = { } d) Set = { }
96. A _____ is a mutable and an unordered collection of elements without duplicates.
97. How many arguments are there in the sort() function?
a) 1 b) 2 c) 3 d) 0
98. _____ is a powerful feature in python.
a) Set b) Assignment statement c) List assignment d) Tuple assignment
99. _____ are used to access all elements from a list.
a) If b) loop c) array d) tuple
100. Which of the following function used to include an element in a list at a desired position?
a) insert( ) b) extend( ) c) endlist( ) d) append( )
101. Write the output for the following.
A = {1, 2, 4, 5}
B = {1, 6, 7, 5}
print (A +B)
a) {1, 2, 4, 5, 6, 7} b) [2, 4] c) (2, 4) d) {2, 4}
102. _____ function is used to generate a series of values in python.
a) range b) series c) Fill series d) Auto fill
103. The function is used to create tuples from a list _____.
104. How many values can be returned by the functions in python?
a) 1 b) 2 c) 4 d) many
105. Which function is used to add a single element to an existing list?
a) append ( ) b) extend( ) c) Add ( ) d) more( )
106. Assertion (A): Index to is the lower limit of the range.

Reason (R): Index from is the upper limit of the range.
a) Both A and R are true and R is the correct explanation for A.
b) Both A and R are true but R is not the correct explanation for A.
c) A is true, but R is false. d) A is false, but R is true.

107. Choose the correct statement:
a) In python, the lists are mutable. b) Append ( ) function is used to add more element.
c) Extend ( ) function is used to add single element.
d) Insert ( ) function is used to insert at last element only.

108. Pick odd one with including elements in list.
a) append() b) extend() c) insert() d) include

109. The _____ operator is used to find symmetric difference set operation in python
a) | b) ^ c) & d) @

110. Which of the following is used to delete known elements where the index value is known?
a) Del b) Remove ( ) c) delete d) del( )

111. _____ returns the index value of the first recurring element.

112. A list element can be changed using _____ operator.
a) Arithmetic b) Assignment c) Binary d) Conditional

113. _____ is a simplest way of creating sequence of elements that satisfy a certain conditions.

114. How many ways of deleting the elements from a list are there?
a) 1 b) 2 c) 3 d) 4

115. Which of the following argument is optional in sort( )?
a) Reverse b) True / false c) Key d) a and c

116. Identify the wrong statement from the following.
a) The elements of the tuple are enclosed by parenthesis
b) The elements of a tuple can be even defined without parenthesis
c) The list elements have to be given in square brackets d) Iterating list is faster than tuples

117. The ranges function has _____ arguments.
a) 1 b) 2 c) 3 d) 4

118. Which function is used to deletes only element and retains the list?
a) del ( ) b) clear ( ) c) remove ( ) d) erase ( )

119. Join is called as _____ in sets.
a) union b) intersection c) difference d) symmetric difference

120. Write the output.
list = [34, 45, 48]
list.append(90)
a) [34, 45, 48, 90] b) [90, 34, 45, 48] c) [34, 90, 45, 48] d) [34, 45, 90, 48]

121. Which value of index counts from the beginning of the list elements?
a) Positive b) Negative c) Both (a) and (b) d) None of these

122. Which function is used to convert the result of range( ) function in to list?
a) list( ) b) listrange( ) c) range( ) d) convert( )

123. In list, the negative index number begin with
a) 1 b) -1 c) 0.1 d) 0

124. Assertion (A): The Tuple () function is used to create Tuples from a list.
Reason (R): When you create a tuple, from a list, the elements should be enclosed curly brackets.
a) Both A and R are true and R is the correct explanation for A.
b) Both A and R are true but R is not the correct explanation for A.
c) A is true, but R is false. d) A is false, but R is true.

125. Write the output for the following.
A = {'A', 2, 4, 'D'}
B = {'A', 'B', 'C', 'D'}
a) {'B', 'C'} b) {2, 4} c) (2, 4) d) (13, 'C')

126. _____ operator is used to change the list of elements.
a) = b) + c) += d) *=

127. mylist = [36, 12, 12]
x = mylist.count(12)

print(x) gives the vlaue as _____.
a) 2 b) 3 c) 0 d) 1

128. Which value of index counts backward from end of the list?
a) Positive b) Negative c) Both (a) and (b) d) None of these

129. If the range is specified as [1 : 5], it will update the elements from _____.
a) 2 to 4 b) 1 to 5 c) 1 to 4 d) 2 to 5

130. Which of the following function used to delete one or more elements in the list where the index value is not known
a) del( ) b) delmore( ) c) delete( ) d) remove( )

131. Write the output for the following.
Tu = {1, 2, 4, 4, 5, 6}
print (Tu (4:))
a) 4, 5, 6 b) 6 c) 5, 6 d) 4, 4, 5, 6

132. Index value can be positive or negative in the list _____.
a) True b) False

133. Match the following:
(1) mylist[] - (i) tuple
(2) mylist[10,[2,4,6]]- (ii) Empty tuple
(3) t=(23,56,89) - (iii) Nested list
(4) lis=0 - (iv) empty list
a) 1 - (iv), 2 - (iii), 3 - (i), 4 - (ii) b) 1 - (i), 2 - (ii), 3 - (iii), 4 - (iv)
c) 1 - (iv), 2 - (ii), 3 - (i), 4 - (iii) d) 1 - (i), 2 - (iii), 3 - (iv), 4 - (ii)

134. In Python, a _____ is a mixed collection of elements but it stores a key along with its element?
a) List b) Tuple c) Set d) Dictionary

135. A list or tuples can be converted as set by using _____ function.
a) set b) create set c) change d) alter

136. Which of the following is not datatype in Python?
a) List b) String c) Tuples d) Set

137. Which of the following statement is incorrect?
(i) List are immutable
(ii) Tuples are mutable
(iii) Tuples are enclosed in [ ] and also ( )
(iv) Iterating list is faster than tuples.
a) i, ii b) i, iii, iv c) ii, iv d) All of these

138. What is the output?
>>> n= [for x in range (1, 10):
>>> print (n)
a) [1,2,3,4,5,6,7,8,9] b) [1,2,3,4,5,6,7,8,9,10] c) both (a) and (b) d) [2,3,4,5,6,7,8]

139. Choose the correct pair from the following.
a) I - union b) - - intersection c) & - Difference d) ^ - Symmetric difference

140. Which of the following can be used to access an element in a list?
a) Identifier b) Subscript c) Function d) Integer

141. Which is an optional argument in range() _____ function.
a) start value b) end value c) step value d) default

142. _____ function is used to add a single element in the list.

143. Pick the odd one out:
a) append() b) count() c) extend() d) insert()

144. A _____ in Python is known as a "sequence datatype"
a) Tuples b) List c) Set d) Dictionary

145. What is used, a list is simply created in python?
a) [ ] b) ( ) c) { } d) All of them

146. Which of the following is an incorrect statement?
(i) A list in python is not a sequence data type
(ii) The elements of list should be specified with in [ ]
(iii) A list can be immutable.

(iv) A list contains another list as an element
a) i, ii and iv b) ii and iii c) ii and iv d) i and iii

147. Which of the following can be defined with or without( )?
a) list b) set c) dictionary d) none of these

148. What is the output.
>>> m = [4,3,4,2,4]
>>> n = m. count (4)
>>> print (n)
a) 4 b) 3 c) 2 d) 5

149. Which of the following is a correct statement?
(i) The append( ), insert( ) and extend( ) functions are used to include more elements in a tuple.
(ii) The remove( ) and pop are used to delete elements from a set.
(iii) Creating a Tuple with are element is called 'Singleton' Tuple.
(iv) A Dictionary is a collection of element of sametype.
a) i and iii b) ii and iv c) iv only d) i and iv

150. Identify the intersection operator.
a) + b) / c) // d) &

ANSWERS

1. c) |	21. b) Loops	41. a) The dictionary type stores a index along with its element
2. Comma	22. b) {1, 2, 3}	42. d) tup(10, 20)
3. b) Error	23. d) 34, 45, 48, 90	43. a) Union( )
4. b) Tuple = ( )	24. d) del ( ) - delete single element	44. b) Python negative lists index in sequence order.
5. a) A list is simply created by using curly brackets.	25. [] or empty square bracket	45. b) (i)- B, (ii) - A, (iii) - D, (iv) - C
6. b) {}	26. b) [ ]	46. c) len( )
7. d) negative	27. b) Key value pairs	47. a) clear( )
8. a) [ ]	28. d) All are true	48. c) ^
9. pop()	29. [35, 455, 48, 71, 32, 29]	49. c) 9 1
10. a) One	30. d) Set( )	50. b) 3
11. c) index	31. a) (i)-D, (ii) - A, (iii) - B, (iv) - C	51. a) del
12. a) Tuple Assignment	32. a) pop( )	52. b) =
13. b) [0,2,4]	33. a) E	53. b) Tuple - mutable
14. d) More than are	34. c) List comprehension	54. c) {}
15. c) Index value	35. a) when new element is inserted in the list, the existing elements shift one position to the right	55. Nested tuple
16. a) []	36. c) 75	56. c) List
17. b) 3	37. a) []	56. c) List
18. a) Both A and R are true and R is the correct explanation for A.	38. a) append ()	57. del
19. b) append( )	39. a) union - more sets	58. b) range ( )
20. copy()	40. b) A list is a numeric constant	59. d) clear
		60. d) =

61. d) (i)- D, (ii) - A, (iii) - B, (iv) - C
62. d) -2
63. d) tuple ()
64. a) Both A and R are true and R is the correct explanation for A
65. b) extend( )
66. c) :
67. a) Dictionary
68. c) +
69. b) (i)- C, (ii)- A, (iii) - D, (iv) - B
70. d) Del
71. d) List
72. a) Tuples
73. a) (i) - 4; (ii) - 3; (iii) - 1; (iv) - 2
74. c) no sorting
75. c) A is true, but R is false.
76. a) it will be appended
77. c) List - Initial value 1
78. c) del
79. list()
80. Tuple
81. c) pop ( )
82. b) :
83. d) { }
84. a) (i)- B, (ii) - D, (iii) - A, (iv) - C
85. a) pop( )
86. c) Tuple
87. b) tuples
88. a) If
89. c) extend( )
90. d) :
91. d) Dictionary - Numeric constant
92. del and remove()
93. a) loop
94. b) |
95. c) Tuple = { }
96. Set
97. b) 2
98. d) Tuple assignment
99. b) loop
100. a) insert( )
101. d) {2, 4}
102. a) range
103. tuple()
104. d) many
105. a) append ( )
106. a) Both A and R are true and R is the correct explanation for A.
107. a) In python, the lists are mutable.
108. d) include
109. b) ^
110. b) Remove ( )
111. index()
112. b) Assignment
113. List comprehension
114. b) 2
115. d) a and c
116. d) Iterating list is faster than tuples
117. b) 2
118. b) clear ( )
119. a) union
120. a) [34, 45, 48, 90]
121. a) Positive
122. a) list( )
123. b) -1
124. c) A is true, but R is false.
125. a) {'B', 'C'}
126. a) =
127. a) 2
128. b) Negative
129. c) 1 to 4
130. d) remove( )
131. c) 5, 6
132. a) True
133. a) 1 - (iv), 2 – (iii), 3 - (i), 4 - (ii)
134. d) Dictionary
135. a) set
136. b) String
137. d) All of these
138. a) [1,2,3,4,5,6,7,8,9]
139. d) ^ - Symmetric difference
140. b) Subscript
141. c) step value
142. append()
143. b) count()
144. b) List
145. a) [ ]
146. d) i and iii
147. d) none of these
148. b) 3
149. c) iv only
150. d) &
150. d) &

PART B

1. What is List in Python?

- A list in Python is known as a **"sequence data type"** like strings.
- It is an ordered collection of values enclosed within square brackets [ ].
- Each value of a list is called as element. It can be of any type such as numbers, characters, strings and even the nested lists

2. How will you access the list elements in reverse order?

- In Python, we can access the list elements in reverse order using reverse Indexing.
- Python enables reverse or negative indexing for the list elements.
- Thus Python lists index in opposite order.
- The python sets -1 as the index value for the last element in list and -2 for the preceding element and so on. This is called as Reverse Indexing.

3. What will be the value of x in following python code?

List1 = [2,4,6[1,3,5]]

x = len (List1)

Answer

x = 4.

4. Differentiate del with remove( ) function of List.

del function :

- del statement is used to delete known elements.
- The del statement can also be used to delete entire list.

remove( ) function:

- remove( ) function is used to delete elements of a list if its index is unknown.
- The remove () function can be used to delete one or more elements if the index value is not known.

5. Write the syntax of creating a Tuple with n number of elements.

Syntax 1:

Tuple with n number elements

Tuple_Name = (E1, E2, E2 ……. En)

Example:

MyTup1 = (23, 56, 89, 'A', 'E', 'I', "Tamil")

Syntax 2:

Elements of a tuple without parenthesis

Tuple_Name = E1, E2, E3 ….. En

Example:

MyTup2 = 23, 56, 89, 'A', 'E', 'I', "Tamil"

6. What is set in Python?

- In python, a set is a type of collection data type.
- A Set is a mutable and an unordered collection of elements without duplicates. That means the elements within a set cannot be repeated.
- This feature used to include membership testing and eliminating duplicate elements

7. Name the four collections of data types in python programming language.

Python programming language has four collections of data types such as List, Tuples, Set and Dictionary.

8. Write the syntax of creating list. Give example.

Syntax:

Variable = [element-1, element-2, element-3 …… element-n]

Example:

Marks = [10, 23, 41, 75]

Fruits = ["Apple", "Orange", "Mango", "Banana"]

MyList = [ ]

9. What is nested list? Give example.

- Mylist contains another list as an element. This type of list is known as **"Nested List".**
- Nested list is a list containing another list as an element.

Example:

Mylist = ["Welcome", 3.14, 10, [2, 4, 6]]

10. Fill up the following to get the output:

10, 23, 41, 75

Marks = [10, 23, 41, 75]

_____

while i _____ 4:

print (_____)

i = _____

Ans:

i = 0 **, < ,** Marks[i], i+1

11. Write a program to print all elements in the list using reverse indexing.

```
Marks = [10, 23, 41, 75]
i = -1
while i >= -4:
print (Marks[i])
```

```
i = i + -1
```

Output

```
75
41
23
10
```

12. Write a program to display element in a list ("Tamil", "English", "Comp.Science","Maths") using loop to get the output

Tamil
English
Comp. Science
Maths

```
MySubject = ["Tamil", "English", "Comp. Science", "Maths"]
i = 0
while i < len(MySubject):
print (MySubject[i])
i = i + 1
```

Output

```
Tamil
English
Comp. Science
Maths
```

13. Write the syntax of using for keyword to access all elements in the list.

Syntax:

```
for index_var in list:
print (index_var)
```

14. Write a syntax that shows the lists are mutable.

Syntax:

```
List_Variable [index of an element] = Value to be changed
List_Variable [index from : index to] = Values to changed
```

15. Write the output for the following code?

```
list=[2,4,6]
list[0:3]=[1,3,5]
for x in list:
print(x)
```

Output:

```
3
5
```

16. Differentiate append( ) and extend( ) function.

append( ):

append( ) function is used to add a single element to the list as last element.

Syntax:

```
list_var.append( element )
```

Example:

```
li=[10,20,30,40]
li.append(50)
print(a)
```

Output:

```
[10,20,30,40,50]
```

extend( ):

extend( ) function is used to add more than one element to the list as last elements.

Syntax:

list_var.extend([element])

Example:

```
li=[10,20,30,40]
li.extend([50,60])
print(a)
```

Output:

[10,20,30,40,50,60]

17. How will you insert elements in a list? Write the syntax.

To include an element at your desired position, you can use insert ( ) function. The insert( ) function is used to insert an element at any position of a list.

Syntax:

List.insert (position index, element)

18. Write the syntax of append( ) and extend( ) function.

Syntax:

List.append (element to be added)

List.extend ([elements to be added])

19. Write the syntax of deleting elements from the list.

Syntax:

```
del List [index of an element]
# to delete a particular element
del List [index from : index to]
# to delete multiple elements
del List
# to delete entire list
```

20. How will you delete the elements from the list if the index value is not known?

The remove( ) function can also be used to delete one or more elements if the index value is not known.

21. State the working of pop( ) and clear( ) function.

pop( ):

pop( ) function can also be used to delete an element using the given index value. pop( ) function deletes and returns the last element of a list if the index is not given.

Syntax:

list_var.pop(index)

Example:

```
>>>li.pop(2)
30
```

clear( ):

The function clear( ) is used to delete all the elements in list, it deletes only the elements and retains the list.

22. Write the output for the following code.

(i) print (list (range (1, 11, 2)))

(ii) print (list (range(2, 11, 2)))

Output:

(i) [1,3,5,7,9]

(ii) [2,4,6,8,10]

23. Write a python program to print the following output

[1, 4, 9, 16, 25, 36, 49, 64, 81, 100]

```
squares = [ ]
for x in range(1,11):
s = x ** 2
squares.append(s)
print (squares)
```

24. Write a python program to generate the squares of even numbers between 1 and 10 using the concept of list comprehensions.

```
squares = [ x ** 2 for x in range(1,11) ]
print (squares)
```

Output:

[1, 4, 9, 16, 25, 36, 49, 64, 81, 100]

25. What is output for the following code?

```
list = ['T', 'T', 'A', 'S', 'L']
list. sort (reverse = false)
print (list)
```

Output:

['A','L','S','T','T']

26. Write a program that creates a list of numbers from 1 to 20 that are divisible by 4.

```
divBy4=[ ]
for i in range(21):
if (i%4==0):
divBy4.append(i)
print(divBy4)
```

Output

[0, 4, 8, 12, 16, 20]

27. What is Tuple in python?

- Tuples consists of a number of values separated by comma and enclosed within parentheses.
- Tuple is similar to list, values in a list can be changed but not in a tuple.
- Example: (2,4,6)

28. Write the syntax of defining tuple.

Syntax:

Empty tuple

Tuple_Name = ( )

Tuple with n number elements

Tuple_Name = (E1, E2, E2 ……. En)

Elements of a tuple without parenthesis

Tuple_Name = E1, E2, E3 ….. En

29. What is the use of tuple( ) function? Give example.

The tuple( ) function is used to create Tuples from a list. When you create a tuple, from a list, the elements should be enclosed within square brackets.

Syntax:

Tuple_Name = tuple([list elements])

Example:

```
MyTup3 = tuple( [23, 45, 90] )
print(MyTup3)
```

Output:

(23, 45, 90)

30. Write the output

```
tup = (10)
type (tup)
tup1 = (10,)
type (tup)
```

Output:

<class 'int'>

<class 'tuple'>

31. Give an example of joining two tuples.

Tup1 = (2,4,6,8,10)

```
Tup2 = (1,3,5,7,9)
Tup3 = Tup1 + Tup2
print(Tup3)
```

Output

(2, 4, 6, 8, 10, 1, 3, 5, 7, 9)

32. Write a program to swap two values using tuple assignment.

```
a = int(input("Enter value of A: "))
b = int(input("Enter value of B: "))
print("Value of A = ", a, "\n Value of B = ", b)
(a, b) = (b, a)
print("Value of A = ", a, "\n Value of B = ", b)
```

Output:

Enter value of A: 54
Enter value of B: 38
Value of A = 54
Value of B = 38
Value of A = 38
Value of B = 54

33. How will you create a set using list or tuple? Give an example.

A list or Tuple can be converted as set by using set( ) function. This is very simple procedure. First you have to create a list or Tuple then, substitute its variable within set( ) function as argument.

```
MyList=[2,4,6,8,10]
MySet=set(MyList)
print(MySet)
```

Output:

{2, 4, 6, 8, 10}

34. Write the output.

```
A = {'A', '2', '4', 'D'}
B = {'A', 'B', 'C', 'D'}
print (A | B)
print (A & B)
print (A - B)
print (A ^ B)
```

Output:

{'A',2,4,'D','B','C'}
{'A','D'}
{2,4}
{2,4,'B','C'}

35. Write a short note on dictionary.

In python, a dictionary is a mixed collection of elements. Unlike other collection data types such as a list or tuple, the dictionary type stores a key along with its element. The keys in a Python dictionary is separated by a colon (:) while the commas work as a separator for the elements. The key value pairs are enclosed with curly braces { }.

PART C

1. What are the advantages of Tuples over a list?

- The elements of a list are changeable (mutable) whereas the elements of a tuple are unchangeable (immutable), this is the key difference between tuples and list.
- The elements of a list are enclosed within square brackets. But, the elements of a tuple are enclosed by paranthesis.
- Iterating tuples is faster than list.

2. Write a shot note about sort( ).

sort( ):

- Sorts the element in list.
- Both arguments are optional

- If reverse is set as True, list sorting is in descending order.
- Ascending is default.
- Key=myFunc; "myFunc" - the name of the user defined function that specifies the sorting criteria.
- sort( ) will affect the original list.

Example:

```
List.sort(reverse=True|False, key=myFunc)
MyList=['Thilothamma', 'Tharani', 'Anitha', 'SaiSree', 'Lavanya']
MyList.sort( )
print(MyList)
MyList.sort(reverse=True)
print(MyList)
```

Output:

```
['Anitha', 'Lavanya', 'SaiSree', 'Tharani', 'Thilothamma']
['Thilothamma', 'Tharani', 'SaiSree', 'Lavanya', 'Anitha']
```

3. What will be the output of the following code?

```
list = [2**x for x in range(5)]
print(list)
```

Output:

[1,2,4,8,16]

4. Explain the difference between del and clear( ) in dictionary with an example.

del ( ):

- It is used to delete elements if the index value is known.
- Used to delete particular element ,multiple elements and entire list

Syntax:

del list_var[index of an element]

Example:

```
del m[2]
```

clear( ):

clear( ) is used to delete only all the elements and retain the list..

Syntax:

list_var.clear()

Example:

```
>>>m.clear()
>>> print(m)
[ ]
```

5. List out the set operations supported by python.

The python is supports the following set operations:

(i) Union: It includes all elements from two or more sets

(ii) Intersection: It includes the common elements in two sets

(iii) Difference: It includes all elements that are in fi rst set (say set A) but not in the second set (say set B)

(iv) Symmetric difference: It includes all the elements that are in two sets (say sets A and B) but not the one that are common to two sets

6. What are the difference between List and Dictionary?

Difference between List and Dictionary

List:

- List is an ordered set of elements.
- The index values can be used to access a particular element.
- Lists are used to look up a value whereas.

Dictionary:

- A dictionary is a data structure that is used for matching one element (Key) with another (Value).
- A dictionary key represents index. The key may be a number of a string.
- A dictionary is used to take one value and look up another value.

7. Write a program to remove duplicates from a list.

```
mylist=[1,2,3,4,5,1,2,3,4,5]
r=[ ]
for i in mylist:
if i not in res:
res.append(i)
print(res)
```

8. Write a program that prints the maximum value in a tuple.

```
tuple1= (5,17,15,20,7,3)
print("Maximum value", max(tuple1))
```

9. Write a program that finds the sum of all the numbers in a tuples using while loop.

```
li = [15,25,17]
s=0
i=0
while i<len(i):
s=s+li[i]
i+=1
print(s)
```

10. Write a program that finds sum of all even numbers in a list.

```
list =[1,2,3,4,5,6,7,8,9,10]
e=0
for i in list:
if i%2 ==0:
e=e+i
print("Sum of even number",e)
```

11. Write a program that reverse a list using a loop.

```
list = [1,2,3,4,5]
i=-1
while i>=-5:
print (list[i])
i=i+-1
```

12. Write a program to insert a value in a list at the specified location.

```
list=[1,2,4,5]
list insert(2,3)
print(list)
```

13. Write a program that creates a list of numbers from 1 to 50 that are either divisible by 3 or divisible by 6.

```
a=[ ]
for i in range (1,51):
if i%3 ==0
(a) append (i)
print (a)
```

14. Write a program to create a list of numbers in the range 1 to 20. Then delete all the numbers from the list that are divisible by 3.

```
list=[]
for i in range(1,20):
list.append(i)
print("List of numbers from 1-20",list)
for i in range(1,20):
if i%3==0:
list.remove(i)
print("List of numbers from 1-20 after deletion of numbers divisible by 3",list)
```

15. Write a program that counts the number of times a value appears in the list. Use a loop to do the same.

```
list=[8,6,8,10,8,20,10,8,8]
x=8
x=li.count(x)
print(x)
```

16. Write a program that prints the maximum and minimum value in a dictionary.

```
dict={'a':10,'b':20,'c':5}
v=dict.values()
print("Maximum =",max(v))
print("Minimum=",min(v))
```

17. How will you find the length of a list? Explain with an example.

The len( ) function in Python is used to find the length of a list. (i.e., the number of elements in a list). Usually, the len( ) function is used to set the upper limit in a loop to read all the elements of a list. If a list contains another list as an element, len( ) returns that inner list as a single element.

Example:

```
MySubject = ["Tamil", "English", "Comp. Science", "Maths"]
len(MySubject)
4
```

18. Fill up the following program to get the output TECM.

```
list = ['T', 'E', 'C', 'M']
i = 0
(i) while _____;
(ii) _____ (MySubject[i] , _____)
(iii) _____ i = i + 1
```

Ans:

(i) i<len(list)
(ii) print
(iii) end='\t'

19. How will you change the list elements in Python? Give an example.

In Python, the lists are mutable, which means they can be changed. A list element or range of elements can be changed or altered by using simple assignment operator (=).

```
MyList = [1, 3, 5, 7, 9]
print ("List Odd numbers... ")
for x in MyList:
print (x)
MyList[0:5] = 2,4,6,8,10
print ("List Even numbers... ")
for y in MyList:
print (y)
```

20. What is the output for the following code?

```
MyList = [2, 4, 5, 8, 10]
print ("MyList elements before update... ")
for x in MyList:
print (x)
MyList[2] = 6
print ("MyList elements after updation... ")
for y in MyList:
print (y)
```

Output:

```
MyList elements before update...
2
4
5
8
10
MyList elements after updation...
```

2
4
6
8
10

21. What is the output of the following code?

(i) list = [34, 45, 48]
print (list. append (80))
(ii) list = [34, 45, 48]
print (list. extend (80, 90))
(iii) list = [34, 98, 47, 55]
list. insert (3, 90)
print (list)
Output:

(i) [34,45,48,80]
(ii) [34,45,48,80,90]
(iii) [34,98,47,90,55]

22. Read the following program and write the output according to the print statement mentioned

list = ['T', 'H', 'N', 'M']
del list [1]
(i) print (list)
del list [1:3]
(ii) print (list)'
del list
(iii) print (list)
Output:

(i) ['T','N','M']
(ii) ['T']
(iii) Error

23. Write the syntax of remove( ), pop( ) and clear( ).

Syntax:

List.remove(element)
List.pop(index of an element)
List.clear( )

24. Read the following and write the output given by the print function mentione(d)

list = [12, 89, 34, 79, 80]
(i) print (list. remove (34))
(ii) print (list. pop (1))
(iii) print (list. clear ( ))
Output:

(i) [12,89,79,80]
(ii) [12,79,80]
(iii) [ ]

25. Write a note on list comprehensions.

List comprehension is a simplest way of creating sequence of elements that satisfy a certain condition.

Syntax:

List = [expression for variable in range]

Exampe:

```
squares = [ x ** 2 for x in range(1,11) ]
print (squares)
```

Output:

[1, 4, 9, 16, 25, 36, 49, 64, 81, 100]

26. Write the output for the following.

list = [36, 12, 12]

(i) print (list. count (12))
(ii) print (list. index (12))
(iii) print (list. reverse( ))
Output:
2
1
[12,12,36]

27. Write a program to define a list of countries that are a member of BRICS. Check whether a county is member of BRICS or not.

```
country=["India", "Russia", "Srilanka", "China", "Brazil"]
is_member = input("Enter the name of the country: ")
if is_member in country:
print(is_member, " is the member of BRICS")
else:
print(is_member, " is not a member of BRICS")
```

Output
Enter the name of the country: India
India is the member of BRICS

Output
Enter the name of the country: Japan
Japan is not a member of BRICS

28. Differentiate list and tuple.

List:
- In a list, elements are defined within square brackets.
- Elements are changeable.
- Slower than tuples
- Example: [1,2,3]

Tuple:
- In tuples, they may be enclosed by parenthesis.
- Elements are unchangeable.
- Faster then list
- Example: (1,2,3)

29. Explain with an example how will you create a tuple with a single element.

While creating a tuple with a single element, add a comma at the end of the element. In the absence of a comma, Python will consider the element as an ordinary data type; not a tuple. Creating a Tuple with one element is called “Singleton” tuple.

```
MyTup4 = (10)
type(MyTup4)
<class 'int'>

MyTup5 = (10,)
type(MyTup5)
<class 'tuple'>
```

30. Write the output for the following.

Tup = (12, 78, 91, 'A', 'B', 3, 69)
1. print (Tup1 [2:5]) _____
2. print (Tup [:5]) _____
3. print (Tup [4:]) _____
4. print (Tup [:]) _____
5. print (Tup) _____
Output:
1 (91,’A’,’B’)
2 (12,78,91,’A’,’B’)
3 (‘B’,3,69)

4 (12,78,91,'A','B',3,69)
5 (12,78,91,'A','B',3,69)

31. Write a note on Tuple assignment.

Tuple assignment is a powerful feature in Python. It allows a tuple variable on the left of the assignment operator to be assigned to the values on the right side of the assignment operator. Each value is assigned to its respective variable.

```
(a, b, c) = (34, 90, 76)
print(a,b,c)
34 90 76
```

32. How will create a set in python? Give an example.

A set is created by placing all the elements separated by comma within a pair of curly brackets. The set() function can also used to create sets in Python.

Syntax:

```
Set_Variable = {E1, E2, E3 …….. En}
```

Example :

```
S1={1,2,3,'A',3.14}
print(S1)
{1, 2, 3, 3.14, 'A'}
S2={1,2,2,'A',3.14}
 print(S2)
{1, 2, 'A', 3.14}
```

33. How will delete an entire tuple? Give an example.

To delete an entire tuple, the del command can be used.

Syntax:

```
del tuple_name
Tup1 = (2,4,6,8,10)
print("The elements of Tup1 is ", Tup1)
del Tup1
print (Tup1)
```

34. Write a note on dictionary comprehension.

In Python, comprehension is another way of creating dictionary. The following is the syntax of creating such dictionary.

Syntax

```
Dict = { expression for variable in sequence [if condition] }
```

The if condition is optional and if specified, only those values in the sequence are evaluated using the expression which satisfy the condition.

```
Dict = { x : 2 * x for x in range(1,10)}
```

Output of the above code is

```
{1: 2, 2: 4, 3: 6, 4: 8, 5: 10, 6: 12, 7: 14, 8: 16, 9: 18}
```

PART D

1. What the different ways to insert an element in a list. Explain with suitable example.

In Python, append( ) function is used to add a single element and extend( ) function is used to add more than one element to an existing list at the end of the list

Syntax:

```
List.append (element to be added)
List.extend ( [elements to be added])
```

In extend( ) function, multiple elements should be specified within square bracket as arguments of the function.

Example

```
>>> Mylist=[34, 45, 48]
>>> Mylist.append(90)
>>> print(Mylist)
[34, 45, 48, 90]
```

In the above example, Mylist is created with three elements.

>>> Mylist.append(90) statement, an additional value 90 is included with the existing list as last element.

```
>>> Mylist.extend([71, 32, 29])
>>> print(Mylist)
[34, 45, 48, 90, 71, 32, 29]
```

In the above code, extend( ) function is used to include multiple elements.

Insert element using Insert():

If we want to include an element at our desired position, we can use insert ( ) function. The insert( ) function is used to insert an element at any position of a list.

Syntax:

List.insert (position index, element)

Example:

```
>>> MyList=[34,98,47,'Kannan', 'Gowrisankar', 'Lenin', 'Sreenivasan' ]
>>> print(MyList)
[34, 98, 47, 'Kannan', 'Gowrisankar', 'Lenin', 'Sreenivasan']
>>> MyList.insert(3, 'Ramakrishnan')
>>> print(MyList)
[34, 98, 47, 'Ramakrishnan', 'Kannan', 'Gowrisankar', 'Lenin', 'Sreenivasan']
```

In the above example, insert( ) function inserts a new element 'Ramakrishnan' at the index value 3, ie. at the 4th position.

While inserting a new element in between the existing elements, at a particular location, the existing elements shifts one position to the right.

2. What is the purpose of range( )? Explain with an example.

Purpose of range():

- The range( ) is a function used to generate a series of values in Python.
- Using range( ) function, we can create list with series of values.
- The range( ) function has three arguments.

Syntax of range ( ) function:

range (start value, end value, step value)

where,

start value – beginning value of series. Zero is the default beginning value.

end value – upper limit of series. Python takes the ending value as upper limit – 1.

step value – It is an optional argument, which is used to generate different interval of values.

Example:

```
for x in range (2, 11, 2):
print(x)
```

Output

```
2
4
6
8
10
```

Creating a list with series of values

Using the range( ) function, we can create a list with series of values. To convert the result of range( ) function into list, we need one more function called list( ). The list( ) function makes the result of range() as a list.

Syntax:

List_Varibale = list (range ( ))

Example:

```
>>> Even_List = list(range(2,11,2))
>>> print(Even_List)
[2, 4, 6, 8, 10]
```

In the above code, list( ) function takes the result of range( ) as Even_List elements. Thus, Even_List list has the elements of first five even numbers.

We can create any series of values using range( ) function.

Example:

```
squares = [ ]
for x in range(1,11):
s = x ** 2
squares.append(s)
print (squares)
```

Output

[1, 4, 9, 16, 25, 36, 49, 64, 81, 100]

3. What is nested tuple? Explain with an example.

Nested Tuples

- In Python, a tuple can be defined inside another tuple is called Nested tuple.
- In a nested tuple, each tuple is considered as an element.
- The **for** loop will be useful to access all the elements in a nested tuple.

Example

```
Toppers = (("Vinodini", "XII-F", 98.7), ("Soundarya", "XII-H", 97.5),
("Tharani", "XII-F", 95.3), ("Saisri", "XII-G", 93.8))
for i in Toppers:
print(i)
```

Output:

('Vinodini', 'XII-F', 98.7) ('Soundarya', 'XII-H', 97.5) ('Tharani', 'XII-F', 95.3) ('Saisri', 'XII-G', 93.8)

4. Explain the different set operations supported by python with suitable example.

Set Operations

The python supports the set operations such as Union, Intersection, difference and Symmetric difference.

(i) Union:

- It includes all elements from two or more sets
- In python, the operator **|** is used to union of two sets.
- The function union( ) is also used to join two sets in python.

Example :

```
a={2,4,6,8}
b={'A', 'B', 'C', 'D'}
print(A|B )
```

Output:

{2, 4, 6, 8, 'A', 'D', 'C', 'B'}

(ii) Intersection:

- It includes the common elements in two sets
- The operator & is used to intersect two sets in python.
- The function **intersection( )** is also used to intersect two sets in python.

Example:

```
a={'A', 2, 4, 'D'}
b={'A', 'B', 'C', 'D'}
print(a & b)
```

Output:

{'A', 'D'}

(iii) Difference:

- It includes all elements that are in first set (say set A) but not in the second set (say set B)
- The minus (-) operator is used to diff erence set operation in python.
- The function **diff erence( )** is also used to diff erence operation

Example :

```
a={'A', 2, 4, 'D'}
b={'A', 'B', 'C', 'D'}
print(a - b)
```

Output:

{2, 4}

(iv) Symmetric difference

- It includes all the elements that are in two sets (say sets A and B) but not the one that are common to two sets.
- The caret (^) operator is used to symmetric difference set operation in python.
- The function **symmetric_difference( )** is also used to do the same operation.

Example :

```
a={'A', 2, 4, 'D'}
b={'A', 'B', 'C', 'D'}
print(a ^ b)
```

Output:

{2, 4, 'B', 'C'}

5. How will access all elements of a list? Explain with an example.

Loops are used to access all elements from a list. The initial value of the loop must be zero. Zero is the beginning index value of a list.

Example:

```
Marks = [10, 23, 41, 75]
i = 0
while i < 4:
print (Marks[i])
i = i + 1
```

Output

```
10
23
41
75
```

The following table shows that the execution of loop and the value to be print.

Iteration	**i**	**while i < 4**	**print (Marks[i])**	**i = i + 1**
1	0	0 < 4 True	Marks [0] = 10	0 + 1 = 1
2	1	1 < 4 True	Marks [1] = 23	1 + 1 = 2
3	2	2 < 4 True	Marks [2] = 41	2 + 1 = 3
4	3	3 < 4 True	Marks [3] = 75	3 + 1 = 4
5	4	4 < 4 False	--	--

6. How will you access elements of a list using for loop? Explain with an example.

In Python, the **for** loop is used to access all the elements in a list one by one. This is just like the **for** keyword in other programming language such as C++.

Syntax:

```
for index_var in list:
print (index_var)
```

Here, **index_var** represents the index value of each element in the list. Python reads this "for" statement like English: "For (every) element in (the list of) list and print (the name of the) list items"

Example

```
Marks=[23, 45, 67, 78, 98]
for x in Marks:
print( x )
```

Output

```
23
```

45
67
78
98

In the above example, Marks list has 5 elements; each element is indexed from 0 to 4. The Python reads the **for** loop and **print** statements like English: "For (every) element (represented as x) in (the list of) Marks and print (the values of the) elements".

7. Explain remove( ), pop( ) and clear( ) used in list with an example.

remove( ):

The remove( ) function can also be used to delete one or more elements if the index value is not known.

Syntax:

List.remove(element)

Example:

```
>>> MyList=[12,89,34,'Kannan', 'Gowrisankar', 'Lenin']
>>> print(MyList)
[12, 89, 34, 'Kannan', 'Gowrisankar', 'Lenin']
>>> MyList.remove(89)
>>> print(MyList)
[12, 34, 'Kannan', 'Gowrisankar', 'Lenin']
```

pop( ):

pop( ) function can also be used to delete an element using the given index value. pop( ) function deletes and returns the last element of a list if the index is not given.

pop( ) function is used to delete a particular element using its index value, as soon as the element is deleted, the pop( ) function shows the element which is deleted. pop( ) function is used to delete only one element from a list. Remember that, del statement deletes multiple elements.

Syntax:

List.pop(index of an element)

Example:

```
>>> MyList.pop(1)
34
>>> print(MyList)
[12, 'Kannan', 'Gowrisankar', 'Lenin']
```

clear( ):

The function clear( ) is used to delete all the elements in list, it deletes only the elements and retains the list. Remember that, the del statement deletes entire list.

Syntax:

List.clear( )

Example:

```
>>> MyList.clear( )
>>> print(MyList)
[ ]
```

8. Explain the following function used in list function with an example.

(i) copy( )
(ii) count( )
(iii) index( )
(iv) reverse( )

copy ( )	Returns a copy of the list	List.copy( )	MyList=[12, 12, 36] x = MyList.copy() print(x) **Output:** [12, 12, 36]
count ( )	Returns the number of similar elements present in the last.	List.count(value)	MyList=[36 ,12 ,12] x = MyList.count(12) print(x) **Output:** 2
index ( )	Returns the index value of the first recurring element	List.index(element)	MyList=[36 ,12 ,12] x = MyList.index(12) print(x) **Output:** 0
reverse ( )	Reverses the order of the element in the list.	List.reverse( )	MyList=[36 ,23 ,12] MyList.reverse() print(MyList) **Output:** [12 ,23 ,36]

CHAPTER 10
PYTHON CLASSES AND OBJECTS
PART A

1. Which of the following are the key features of an Object Oriented Programming language?
   a) Constructor and Classes b) Constructor and Object
   c) Classes and Objects d) Constructor and Destructor
2. Functions defined inside a class:
   a) Functions b) Module c) Methods d) section
3. Class members are accessed through which operator?
   a) & b) . c) # d) %
4. Which of the following method is automatically executed when an object is created?
   a) __object__( ) b) __del__( ) c) __func__( ) d) __init__( )
5. A private class variable is prefixed with
   a) __ b) && c) ## d) **
6. Which of the following method is used as destructor?
   a) __init__( ) b) __dest__( ) c) __rem__( ) d) __del__( )
7. Which of the following class declaration is correct?
   a) class class_name b) class class_name<> c) class class_name: d) class class_name[ ]
8. Which of the following is the output of the following program?
   a) Error b) Tamil c) name d) self
9. Which of the following is the private class variable?
   a) __num b) ##num c) $$num d) &&num
10. The process of creating an object is called as:

a) Constructor b) Destructor c) Initialize d) Instantiation

11. Which of the following is not an object oriented language?
a) C++ b) C c) Java d) Python
12. Which of the following called as instances of a class or class variable?
a) Methods b) Datatypes c) Objects d) Functions
13. Functions of the class are called as
a) Loog b) Variables c) Methods d) Members
14. Which of the following with a valid lass definition?
a) Class classname statement_1 b) Class classname : statement_1
c) Class classname( ) statement_1 d) Class classname : : statement_1
15. Which of the following is valid syntax for crating objects?
a) objectname = classname( ) b) objectname : classname( )
c) objectname = classname d) classname = Objectname( )
16. Which of the operator used to accessing members of the class?
a) ; b) . c) , d) :
17. Which of the following can be accessed by using object with dot (.) operator?
a) List b) Tuples c) Dictionary d) None of these
18. Which of the following is valid syntax of accessing class members
a) objectname . classmember( ) b) objectname = classmember( )
c) objectname . classmember d) objectname = classmember
19. Write the output for the following
class test
x, y = 10, 5
s = test( )
print (s. x + s. y)
a) 105 b) 15 c) 10 d) 5
20. Which position of the argument named self in python class method?
a) First b) Second c) Third d) Last
21. Which argument doesn't need a value when we call the method?
a) this b) first c) var d) self
22. Which of the following argument values automatically by python?
a) object b) class c) self d) this
23. How many argument can be taken by Python method even when a method is defined with one argument?
a) 2 b) 3 c) 4 d) 1
24. Which of the following is automatically executed when an object of a class is created?
a) members b) constructor c) destructor d) class
25. In Python, which function will act as a constructor?
a) int b) objectname c) init d) classname
26. In Python, constructor must begin and end with
a) %% and %% b) ++ and ++ c) +- and +- d) _ _ and _ _
27. Which of the following is used to initialize the class variables?
a) Constructor b) Destructor c) Object d) Classmember
28. Which of the following gets executed automatically when an object exit from the scope?
a) Object b) Destructor c) Constructor d) Class
29. By default, the class variables are
a) Private b) Method c) Public d) Protected
30. Which of the following is a valid private variable in python?
a) -i b) i- c) - -i d) i- -
31. Which of the following variables can be accessed only within the class?
a) Protected b) Public c) Private d) None of these
32. _____ and _____ are the key features of object oriented programming.
a) List and tuples b) Variables and methods c) Set and dictionary d) Classes and objects
33. _____ is the main building block in python.
a) Class b) Objects c) Methods d) Constructors

34. Class is a template for the _____
a) Method b) Object c) Members d) Destructor
35. _____ may be a variable declaration, decision control, loop or even a function definition.
a) Class members b) Class definition c) Class instantiation d) Class method
36. In Python, a class is defined by using the _____ class.
a) Operator b) Identifier c) Keyword d) Object
37. Class variable and methods are together known as _____ of the class.
a) Objects b) Functions c) Statements d) Members
38. The _____ of the class should be accessed through instance of a class.
a) Tuples b) Objects c) Members d) Functions
39. The process of creating object is called as
a) Class definition b) Class declaration c) Class instantiation d) Class objects
40. In Python, the class method must name the first argument named as _____.
a) this b) self c) new d) var
41. When class variable declared within class, methods must be prefixed by the _____ and_____.
a) classname, . b) classname, : c) :, classname d) classname, objectname
42. Constructor must begin and with double _____
a) Colon b) Semicolon c) Dot d) Underscore
43. In Python, _____ method is used as destructor.
a) - - des - - ( ) b) - - destructor - - ( ) c) - - init - -( ) d) - - del - - ( )
44. A variable prefixed with _____ become private in nature.
a) double colon b) double underscore c) double dot d) double hyphen
45. Choose the correct statement from the following.
a) objectname.classmember( ) b) objectname : classmember
c) objectname.classmember d) objectname( ).classmember
46. Which of the following is correct declaration of constructor?
a) - - init - - b) - - classname - - ( ) c) - - init - -( ) d) - - classname - -
47. Choose the correct statement from the following.
a) objectname = classname( ) b) objectname : classname( )
c) objectname = classname d) objectname : : classname( )
48. Choose the incorrect statement for the following.
(i) The process of creating object is called "Class definition"
(ii) The class members are accessed using dot (.) operator.
(iii) The first argument of the class method is not self.
(iv) The method argument defined with one argument it takes two arguments with default.
a) i and iii b) ii and iii c) iv only d) i and iv
49. Which of the following is an incorrect statement?
(i) Constructor executed automatically when the object is created
(ii) In Python, "init" which act as a destructor.
(iii) In Python, constructor can be defined only with arguments.
(iv) Construct is used to initialize the class variables.
a) i and iii b) ii and iii c) ii and iv d) iii, iv and ii
50. In python every class has a unique name followed by a:
a) . (dot) b) : (colon) c) - (hyphen) d) ; (semi colon)
51. Class variable and methods are together known as:
a) member of class b) methods c) class variable d) functions
52. Variables defined inside a class are called as:
a) member of class b) methods c) class variable d) function
53. What is the first arguments value defined the class method?
a) self b) init c) proc d) obj
54. What is a special function called in python, which act as constructor?
a) self b) init c) proc d) obj
55. The public variables can be accessed anywhere in the program using:
a) (.) dot operator b) & (ampersan d) c) # (hash) d) % (percentage)
56. Which variable can be accessed only within the class?

a) Public b) Private c) Class variable d) Method

57. Match the following:
(i) Class variable (A) class method
(ii) Class
Instantiation (B) constructor
(iii) init (C) object
(iv) self (D) inside a class
a) (i)- D, (ii) - C, (iii) - B, (iv) -A b) (i)- D, (ii) - B, (iii) - A, (iv) -C
c) (i)- B, (ii) - A, (iii) - C, (iv) -D d) (i)- B, (ii) - C, (iii) - D, (iv) -A

58. Choose the incorrect pair:
a) class - keyword b) Function - method c) constructor - object d) Destructor - exits

59. Choose the correct pair:
a) . (dot) - class member b) _del() - constructor c) _num - public d) : (colon) - object

60. Choose the incorrect statement:
a) Classes and object are the key features of OOP. b) Class is the main building block in python.
c) Class is a template for the object. d) Class has unique name followed by a # (hash).

61. Choose the correct statement:
a) Variable defined inside a class are called as classvariable.
b) Variable defined inside a functions are calledconstructor.
c) Class variable and methods are together knownas function.
d) A Class can be defined only in the top of the python program.

62. Assertion (A) : The process of creating object is called as class instantiation.
Reason (R) : Once a class is created, next you should create an object or instance of that class is known as process of object.
a) Both A and R are true and R is the correct explanation for A.
b) Both A and R are true and R is not the correct explanation for A.
c) A is True but R is false. d) A is false but R is True.

63. Assertion (A) : In python, _del_ ( ) method is used as constructor.
Reason (R) : Constructor is special method gets executed automatically when an object exit from the scope.
a) Both A and R are true and R is the correct explanation for A.
b) A is true but R is false.
c) A is false but R is true.
d) Both A and R are false

64. Pick the odd one out:
a) classes b) object c) destructor d) methods

65. By default, the class variable is:
a) Public b) Private c) Protected d) local

66. Which of the following called as instance of a class or class variable?
a) methods b) objects c) class d) Function

ANSWERS

1. c) Classes and Objects 2. c) Methods 3. b) . 4. d) __init__( ) 5. a) __ 6. d) __del__( ) 7. c) class class_name: 8. b) Tamil 9. a) __num 10. d) Instantiation 11. b) C 12. c) Objects 13. c) Methods 14. a) Class classname statement_1 15. c) objectname = classname 16. b) . 17. d) None of these 18. a) objectname . classmember( ) 19. b) 15 20. a) First 21. d) self 22. c) self	23. a) 2 24. b) constructor 25. c) init 26. d) _ _ and _ _ 27. a) Constructor 28. b) Destructor 29. c) Public 30. c) - -i 31. d) None of these 32. d) Classes and objects 33. a) Class 34. b) Object 35. b) Class 35. b) Class definition 36. c) Keyword 37. d) Members 38. c) Members 39. c) Class instantiation 40. b) self 41. a) classname, . 42. d) Underscore 43. a) - - des - - ( ) 44. b) double underscore 45. c) objectname.classmember 46. c) - - init - -( ) 47. a) objectname = classname( )	48. a) i and iii 49. b) ii and iii 50. b) : (colon) 51. a) member of class 52. c) class variable 53. a) self 54. b) init 55. a) (.) dot operator 56. b) Private 57. a) (i)- D, (ii) - C, (iii) - B, (iv) -A 58. c) constructor - object 59. a) . (dot) – class member 60. d) Class has unique name followed by a # (hash). 61. a) Variable defined inside a class are called as class variable. 62. a) Both A and R are true and R is the correct explanation for A. 63. d) Both A and R are false 64. c) destructor 65. a) Public 66. b) objects

PART B

1. What is class?

- Class is the main building block in Python.
- Object is a collection of data and function that act on those data.
- Class is a template for the object.

2. What is the output of the following program?

```
class Sample:
__num=10
def disp(self):
print(self.__num)
S=Sample()
S.disp()
print(S.__num)
```

ANS:

10
10

3. What is the purpose of Destructor?

- Destructor is also a special method gets executed automatically when an object exit from the scope.
- It is just opposite to constructor.
- It removes the memory of the object when it goes out of scope.

- In Python, __del__( ) method is used as destructor.

4. Write the syntax for class definition.

Syntax:

```
class class_name:
statement_1
statement_2
……..
……..
statement_n
```

5. Differentiate public and private data members.

- The variables which are defined inside the class is public by default. These variables can be accessed in the program using dot operator.
- A variable prefixed with double underscore becomes private in nature. These variables can be accessed only within the class.

6. Write the syntax for the following.

(i) Creating objects

Ans:

Object_name = class_name( )

(ii) Accessing class members

Ans:

Object_name . class_member

7. Name the function which acts as a constructor and destructor.

Constructor – (- - init - -())

Destructor – (- - del - - ())

8. Explain the working of the following program

```
class Sample:
num = 0
def____ init _____ (self, var):
Sample.num += 1
self.var = var
print("The object value is = ", var)
print("The count of object created = " , Sample.num)
S1 = Sample(15)
S2 = Sample(35)
S3 = Sample (45)
```

In the above program, class variable **num** is shared by all three objects of the class Sample. It is initialized to zero and each time an object is created, the num is incremented by 1. Since, the variable shared by all objects, change made to num by one object is reflected in other objects as well.

9. What is instantiation?

Once a class is created, next you should create an object or instance of that class. The process of creating is called as "Class Instantiation".

10. How will you create constructor in Python?

In Python, there is a special function called "init" which act as a Constructor. It must begin and end with double underscore. It is executed automatically when the object is created. This constructor function can be defined with or without arguments. This method is used to initialize the class variables.

General format of __init__ method (Constructor function)

```
def __init__(self, [args ……..]):
statements>
```

11. What is an object?

- Object is a collection of data and function that act on those data.
- Class is a template for the object.
- According to the concept of Object Oriented Programming, objects are also called as instances of a class or class variable.

- In Python, everything is an object.

12. What do you meany statement in a class definition?

A statement in a class definition may be a variable declaration, decision control, loop or even a function definition

13. Write the general form of declaring class in Python.

In Python, a class is defi ned by using the keyword class. Every class has a unique name followed by a colon (:).

Syntax:

class class_name: statement_1 statement_2 …….. …….. statement_n

14. Differentiate python class function and ordinary function.

Python class function or Method is very similar to ordinary function with a small difference that, the class method must have the first argument named as self.

15. Write a program in python that illustrate the use of constructor.

```
class Sample:
def __init__(self, num):
print("Constructor of class Sample...")
self.num=num
print("The value is :", num)
S=Sample(10)
```

16. Write a note on public and private data members of python class.

- The variables which are defined inside the class is public by default. These variables can be accessed anywhere in the program using dot operator.
- A variable prefixed with double underscore becomes private in nature. These variables can be accessed only within the class.

PART C

1. What are class members? How do you define it?

- Variables defined inside a class are called as "Class Variable" and functions are called as "Methods".
- Class variable and methods are together known as members of the class.
- The class members should be accessed through objects or instance of class.
- A class can be defined anywhere in a Python program
- Any class member can be accessed by using object with a dot (.) operator.

2. Find the error in the following program to get the given output?

```
class Fruits:
def __init__(self, f1, f2):
self.f1=f1
self.f2=f2
def display(self):
print("Fruit 1 = %s, Fruit 2 = %s" %(self. f1, self.f2))
F = Fruits ('Apple', 'Mango')
del F.display
F.display()
```

Output

Fruit 1 = Apple, Fruit 2 = Mango

ERROR

The statement del F.display should be removed to get the reqired output.

3. How do define constructor and destructor in Python?

Constructor is the special function that is automatically executed when an object of a class is created.

- In Python, there is a special function called "init" which act as a Constructor. It must begin and end with double underscore. This function will act as an ordinary function; but only difference is, it is executed automatically when the object is created.
- This constructor function can be defined with or without arguments. This method is used to ini-tialize the class variables.

General format of __init__ method (Constructor function)

```
def __init__(self, [args ……..]):
<statements>
```

4. Write a program using class to accept three sides of a triangle and print its area.

```
class area:
def area (self,b,h):
print("Area of Triangle",(b*h)/2)
a=area()
b=int (input ("Enter base"))
h=int (input ("Enter height"))
(a) area (b,h)
```

5. What do you mean by class variable, methods and members related to a class?

- Variables defined inside a class are called as Class Variable.
- Functions defined inside a class are called as Methods.
- Class variable and methods are together known as members of the class.

6. Explain class method in Python.

- Python class function or Method is very similar to ordinary function with a small difference that, the class method must have the first argument named as self.
- No need to pass a value for this argument when we call the method. Python provides its value automatically.
- Even if a method takes no arguments, it should be defined with the first argument called self.
- If a method is defined to accept only one argument it will take it as two arguments ie. self and the argument.
- When we declare class variable within class, methods must be prefixed by the class name and dot operator.

Example:

```
class Odd_Even:
even = 0 #class varaiable
def check(self, num):
if num%2==0:
print(num," is Even number")
else:
print(num," is Odd number")
n=Odd_Even()
x = int(input("Enter a value: "))
n.check(x)
```

7. Write a note on object.

Object is a collection of data and function that act on those data. Class is a template for the object. According to the concept of Object Oriented Programming, objects are also called as instances of a class or class variable. In Python, everything is an object. For example, all integer variables that we use in our program is an object of class int. Similarly all string variables are also object of class string.

8. Write a python program to find total and average marks using class.

```
class Student:
mark1, mark2, mark3 = 45, 91, 71 #class variable
def process(self): #class method
sum = Student.mark1 + Student.mark2 + Student.mark3
avg = sum/3
print("Total Marks = ", sum)
print("Average Marks = ", avg)
return
S=Student()
S.process()
```

9. Write a class with two private class variables and print the sum using a method.

```
class Sample:
def __init__(self, n1, n2):
```

```
self.__n1=n1
self.__n2=n2
def sum(self):
total = self.__n1 + self.__n2
print("Class variable 1 = ", self.__n1)
print("Class variable 2 = ", self.__n2)
print("Sum of class variables = ",total)
S=Sample(12, 14)
S.sum()
```

OUTPUT

```
Class variable 1 = 12
Class variable 2 = 14
Sum of class variables = 26
```

10. What is the output of the following program?

```
class Greeting:
def __init__(self, name):
self.__name = name
def display(self):
print("Good Morning ", self.__name)
obj=Greeting('Bindu Madhavan')
obj.display()
```

OUTPUT

```
Good Morning Bindu Madhavan
```

11. Write a program using class to store name and marks of students in list and print total marks.

```
Class total:
name=[ ]
mark=[ ]
def get (self):
num=input("How many students?:")
for I in self.num;
self.n=input("Enter student name")
self name.append (self.n)
self.m = input("Enter mark of the student")
mark=append (self.m)
def display (self):
for I in self.num
print (name[i]":",mark[i])
t=t+mark[i]
print("Total marks".t)
t=total()
t.get()
t.display()
```

12. Write a menu driven program to read, display, add and subtract two distances.

```
class distance:
def add(self):
return self.num1 + self.num2
def subtract(self):
return self.num1 - self.num2
def read(self):
self.num1=int(input("Enter first distance " ))
self.num2=int(input("Enter second distance " ))
def display(self):
print("Distance 1 = ",self.num1)
print("Distance 2 = ",self.num2)
d = distance()
```

```
ch = 'y'
while(ch=='y'):
print("1. Read Distances ")
print("2. Display Distances ")
print("3. Add Distances ")
print("4. Subtract Distances ")
print("5. Exit ")
select = input("Select operations 1, 2, 3, 4 or 5:")
if select == '1':
d.read()
elif select == '2':
d.display()
elif select == '3':
print("The added distance = ",d.add())
elif select == '4':
print("The subtracted distance = ",d.subtract())
else:
print("Invalid input")
ch=input("Do you want to perform more tasks y/n")
```

13. Explain the method of creation of object for a class and accessing its members.

Creating Objects:

The process of creating object is called as Class Instantiation.

Syntax

Object_name = class_name( )

Accessing Class Members

Any class member ie. class variable or method can be accessed by using object with a dot (.) operator.

Syntax:

Object_name . class_member

Example:

```
class Sample:
#class variables
x, y = 10, 20
S=Sample( ) # class instantiation
print("Value of x = ", S.x)
print("Value of y = ", S.y)
print("Value of x and y = ", S.x+S.y)
```

Output :

```
Value of x = 10
Value of y = 20
Value of x and y = 30
```

14. Write a program to calculate area and circumference of a circle.

PROGRAM

```
class Circle:
pi=3.14
def __init__(self,radius):
self.radius=radius
def area(self):
return Circle.pi*(self.radius**2)
def circumference(self):
return 2*Circle.pi*self.radius
r=int(input("Enter Radius: "))
C=Circle(r)
print("The Area =",C.area())
print("The Circumference =", C.circumference())
```

Output:

Enter Radius: 5
The Area = 78.5
The Circumference = 31.400000000000002

15. Write a note on self argument used in python class function.

Python class function or Method is very similar to ordinary function with a small difference that, the class method must have the first argument named as **self**. No need to pass a value for this argument when we call the method. Python provides its value automatically. Even if a method takes no arguments, it should be defined with the first argument called **self**. If a method is defined to accept only one argument it will take it as two arguments ie. self and the defined argument.

PART D

1. Write a menu driven program to add or delete stationary items. You should use dictionary to store

items and the brand.

```
class stationary:
def getdata (self):
self.itemname=input ("enter name of the item")
self.brand=input("enter brand name")
item={}
ch='y'
while(ch=='y')
print("1.Add items \n 2.Delete items")
n=int (input("enter your choice")
if(n==1):
s=stationary()
s.get data()
item.Append {s}
dif(n==2):
del item
else:print("Invalid Input")
ch=input("Do you want to continue (Y/N")
```

2. Write a python program to check and print if the given number is odd or even using class.

```
class Odd_Even:
even = 0 #class varaiable
def check(self, num):
if num%2==0:
print(num," is Even number")
else:
print(num," is Odd number")
n=Odd_Even()
x = int(input("Enter a value: "))
n.check(x)
```

3. Write a program to calculate area and circumference of a circle.

```
class Circle:
pi=3.14
def __init__(self,radius):
self.radius=radius
def area(self):
return Circle.pi*(self.radius**2)
def circumference(self):
return 2*Circle.pi*self.radius
r=int(input("Enter Radius: "))
C=Circle(r)
```

```
print("The Area =",C.area())
print("The Circumference =", C.circumference())
```

CHAPTER 11
DATABASE CONCEPTS
PART A

1. What is the acronym of DBMS?
   a) DataBase Management Symbol b) Database Managing System
   c) DataBase Management System d) DataBasic Management System
2. A table is known as
   a) tuple b) attribute c) relation d) entity
3. Which database model represents parent-child relationship?
   a) Relational b) Network c) Hierarchical d) Object
4. Relational database model was first proposed by
   a) E F Codd b) E E Codd c) E F Cadd d) E F Codder
5. What type of relationship does hierarchical model represents?
   a) one-to-one b) one-to-many c) many-to-one d) many-to-many
6. Who is called Father of Relational Database from the following?
   a) Chris Date b) Hugh Darween
   c) Edgar Frank Codd d) Edgar Frank Cadd
7. Which of the following is an RDBMS?
   a) Dbase b) Foxpro c) Microsoft Access d) SQLite
8. What symbol is used for SELECT statement?
   a) σ b) Π c) X d) Ω
9. A tuple is also known as
   a) table b) row c) attribute d) field
10. Who developed ER model?
    a) Chen b) EF Codd c) Chend d) Chand
11. Which of the following is an organized collection of data?
    a) Word Processor b) Database c) Spreadsheet d) Programming language
12. Which of the following is an organized collection of data, which can be stared and accursed through computer system
    a) Information b) Worksheet c) DBMS d) Database
13. Which of the following a data contain?
    a) Character b) text c) Word d) Number
14. In which of the following data organized in a way that, it can be easily accessed, managed and updated?
    a) Object b) Structure c) Database d) DBMS
15. Which of the following can be a software or hardware based, with one sole purpose of storing data?
    a) Database b) DBMS c) Object d) SQ
16. Expand DBMS
    a) Database memory system b) Digital Based Management source
    c) Digital Database Management system d) Database Management system
17. Which of the following allows users to store, process and analyze data easily?
    a) DBMS b) My SQL c) Relational Algebra d) Datamodels
18. Which of the following provided an interface to perform various operations to create a database, storing and updating data?
    a) SQL b) DBA c) DBMS d) Algebra
19. Which of the following provides protection and security to the databases?
    a) My SQL b) DBMS c) Oracel d) CSV
20. Which of the following is not an example of DBMS?
    a) CoBoL b) Foxpro c) Dbase d) Ms-Access
21. Which of the following makes the data more meaningful and connected in the database?
    a) Information b) Relationship c) Security d) Data models

22. Which of the following divides the data in such a way that repetition of data is minimum in the database?
a) Segregation b) Consistency c) Normalisation d) Integrity
23. Which of the following characteristics of DBMS become a challenge?
a) Data redundancy b) Data security c) Data integrity d) Data consistency
24. How many major components are there in DBMS?
a) 2 b) 5 c) 3 d) 4
25. Which of the following is not a DBMS component?
a) Hardware/Square b) Data c) Data model d) Procedures
26. Which of the following DBMS components controls everything in a database?
a) Square b) Hardware c) Methods d) Procedures
27. Which of the following DBMS components that manage databases to take backups, report generation?
a) Square b) Hardware c) Procedures d) Data
28. Which of the following used to write commands to update and delete data stored in database?
a) Procedures b) Methods c) Hardware/software d) Database Access language
29. Match the following:

i) Hardware	-	1) It is a resource for which DBMS is designed
ii) Square	-	2) Used to write commands
iii) Data	-	3) Physical components involved in data storage
iv) Procedures a	-	4) Manage databases to take backups.
v) Database Access language	-	5) A program that controls everything

a) (i) - 3; (ii) - 5; (iii) - 1; (iv) - 2; (v) - 4 b) (i) - 3; (ii) - 5; (iii) - 1; (iv) - 4; (v) - 2
c) (i) - 2; (ii) - 5; (iii) - 1; (iv) - 4; (v) - 3 d) (i) - 2; (ii) - 1; (iii) - 5; (iv) - 4; (v) - 3
30. Each row in a table represents a
a) Record b) File c) Data d) Fields
31. Which of the following in a table represents a record?
a) File b) Column c) Data d) Row
32. Which of the following in a table represents a column?
a) Row b) Data c) column d) files
33. Which of the following groups data among records specific categories or types of data?
a) file b) Field c) Table d) Relation
34. How the data can be represented and accessed from a software after complete implementation described by
a) Data model b) Data implementation
c) Data redundancy d) Data integrity
35. Which of the following is a simple abstraction of complex real world data gathering environment?
a) Data redundancy b) Data consistency
c) Data abstraction d) Data model
36. How many types of data models are there?
a) 7 b) 3 c) 5 d) 4
37. Which of the following is not a type of data model?
a) Redundancey model b) Hierarchical model
c) Entity Relationship model d) Object model
38. Which of the following model was developed by IBM?
a) ER model b) Object model
c) Hierarchical model d) Network database model
39. IBM developed Hierarchical model as
a) Data Management system b) Information Hierarchical system
c) Information model system d) Information Management system
40. In which data model, data is represented as a simple tree like structure form?
a) Hierarchical model b) Network database
c) ER model d) Relational model
41. Which of the following data model is mainly used in IBM main frame computers?
a) ER model b) Relational c) Hierarchical d) Object

42. In which year Relational Database model was first purposed?
a) 1960 b) 1970 c) 1964 d) 1974
43. The basic structure of data in relational model is
a) tuples b) columns c) Tables d) rows
44. Which of the following is the most data model used for data base appreciation?
a) Relational b) ER-Model c) Hierarchical d) table
45. Which of the following data base model is an extended form of hierarchical data model?
a) ER-model b) Network c) Object d) Relational
46. Network database model represents the data in which of the relationships?
a) one to one b) many to one c) one to many d) many to many
47. Which data model is easier and faster in accessing the data?
a) Network b) Relational c) ER-mode d) all the above
48. In which database mode, the relationship are created by dividing the object into entity?
a) Network b) Hierarchical c) ER-model d) Object
49. ER-model was developed in the year
a) 1970 b) 1976 c) 1974 d) 1978
50. Which of the following database model is useful in developing a conceptual design for the database?
a) Hierarchical b) Object c) Relational d) ER model
51. Which database model is simple and easy to design logical view of data?
a) Hierarchical b) Object c) ER-model d) Network
52. Which of the following data model stores the data in the form of attributes and methods?
a) Relational b) Object c) ER-model d) All of these
53. Object model stores the data in the form of
a) objects b) attributes and methods
c) classes and inheritance d) all of these
54. GIS expansion is
a) Global Information System b) Geographic Information System
c) Global Information Source d) Geographic Intelligent System
55. Which of the following data model handles Geographic Information System?
a) ER model b) Relational c) Object d) None of these
56. Which data model used in file management system?
a) ER model b) Relational c) Hierarchical d) None of these
57. How many types of DBMS users are there?
a) 4 b) 5 c) 3 d) 2
58. DBA expansion is
a) Data Base Analyst b) Database Analyser
c) Digital Bound Administrations d) Data Base Administrators
59. Who takes care of the security of DBMS?
a) DBA b) end user
c) Software developer d) DB designer
60. Who manages the complete database management system?
a) End user b) DBA
c) DB designer d) software developer
61. Who are the one responsible for identifying the data to be stored in the data base?
a) DBA b) Application programmers
c) Database designers d) End user
62. RDBMS expansion is
a) Redundancy Database Management System b) Relational Database Management System
c) Reliable Database Management System d) Relational Database Mobile System
63. Which of the following is not a RDBMS software?
a) Foxpro b) Oracle c) Maria DB d) My SQL
64. Find the odd man out
a) SQLite b) Maria DB c) Oracle d) Dbase
65. Find the odd man out
a) data model b) ER mode

c) Hierarchical model d) Relational model

66. Database normalization was first proposed by
a) Chen b) Edgar F Cadd c) Edgar IF Codd d) Hugh Darwen

67. The rule "reduce data redundancy and improve data integrity" is known as
a) Chen rule b) Edgar Frank rule
c) Edgar rule d) E F Codd rule

68. How many types of relationships used in a database?
a) 5 b) 4 c) 2 d) 3

69. One classroom has many students is an example of a relationships
a) one to many b) one to one c) many to one d) many to many

70. Which of the following was used for modeling the data stored in relational databases?
a) ER model b) Modern algebra
c) Relational Algebra d) Object model

71. Relational Algebra is used to query the database tables using
a) Dbase b) Relational model
c) ER-Model d) SQL

72. Expansion of SQL is
a) Structured Question Language b) Structured Query Language
c) Selection Query Language d) Selection Question Language

73. Which of the following, represents Unary relational operations SELECT
a) X b) π c) σ d) ∩

74. The symbol represents Unary relation operation PROJECT is
a) π b) σ c) ∪ d) ∩

75. Find the odd man out
a) - b) X c) + d) ∩

76. Which operation is used for selecting a subset with tuples according to a given condition?
a) project b) product c) union d) select

77. Which of the following defines a relation that contains a vertical subset of relation?
a) select b) product c) project d) intersection

78. Which of the following removes the duplicate rows in database?
a) SELECT b) INTERSECTION c) PRODUCT d) PROJECT

79. Which of the following includes all types that are in tables A or in B?
a) A - B b) A ∪ B c) A × B d) A ∩ B

80. Which defines a relation consisting of a set of all tuple that are in both in A and B?
a) A ∩ B b) A ∪ B c) A - B d) A × B

81. The term _____ is used to refer to any of the DBMS
a) Object b) Data mining c) Database d) Data model

82. _____ is formatted data
a) Raw facts b) Information c) Database d) DBMS

83. When the data is processed It gives a meaningful _____
a) Information b) Database c) Facts d) Entities

84. _____ is a repository collection of related data
a) Database b) SQL c) Information d) Entities

85. A _____ is a software used to create, store and manipulate database
a) Relational Algebra b) My SQL
c) DBMS d) SQL

86. In database, the data stored in _____
a) Tables b) Sets c) Lists d) DBMS

87. _____ is the entire collection of related data
a) Square b) Table or file c) Table d) Procedures

88. In _____ where the data is organized as row and column
a) Database b) DBMS
c) Procedure or methods d) File or table

89. Hierarchical model represents a _____ relationship.
a) are to many b) one to one c) many to one d) many to many

90. A Database Table is known as _____
a) Relation b) Table c) Attribute d) Dictionary
91. A table row is known as _____
a) Relation b) tuple c) Attribute d) field
92. A table column is known as _____
a) Relation b) record c) Attribute d) Tuple
93. _____ are also known as relations in a relational model
a) Table rows b) Tuples c) Table columns d) Tables
94. All the information is related to a particular type is stored in _____ of that table
a) Columns b) fields c) file d) rows
95. A relation key is a key which uniquely identifies a particular _____
a) columns b) tuples c) fields d) none of these
96. A _____ is an attribute which uniquely identifies a particular tuple
a) relation key b) row key c) tuple key d) data key
97. Each column in a table represents a _____
a) Record b) Field c) Data d) Method
98. _____ database model is an extended form of hierarchical data model
a) Network b) object c) Relational d) ER model
99. _____ data model provides a clear modular structure of a data
a) Relational b) Hierarchical/ER-model
c) object d) All of these
100. Doctor and Patient is an example of _____ database model
a) Hierarchical b) Relation c) Object d) ER-model
101. In _____ data model, the data stores in the form of classes and inheritance.
a) Hierarchical b) Entity relationship
c) Object d) Network
102. The result of _____ is a relation which includes all tuples that are in A but not in B.
a) A - B b) A ∩ B c) A ∪ B d) A × B
103. _____ is a computer based record keeping system
a) Data model b) DBMS
c) Data relationships d) Entity relationship
104. A way of combining two relations is _____
a) A × B b) A ∪ B c) A ∩ B d) A σ B
105. Relational Algebra was first created by _____
a) Chen b) E F Codd c) Chris Date d) Hugh Darwen
106. _____ are the one who store, retrieve, update and delete data
a) DBA b) Database designers c) End user d) Application developers
107. Choose the correct pair from the following.
a) Table = record b) Table = Attribute c) Table row = tuple d) Table column = Relation
108. Choose the correct pair from the following
a) Project - π b) Select - ∩ c) Product - σ d) Intersection - ∪
109. Choose the incorrect pair from the following
a) Intersection - ∩ b) Product - ∪ c) Select - σ d) Project - π
110. Choose the incorrect pair from the following
a) Table = file b) Table row = tuple c) Table = Relation d) Table = Data
111. Choose the correct statement from the following
a) In 1970, Chen developed the ER-model
b) Object model does not store the data in the form of classes and inheritance.
c) In 1976, EF Codd proposed Relational database model
d) Data model is a simple abstraction of complex real world data gathering environment.
112. Choose the correct statement from the following
a) Using ER model, it is easy to design logical view of data
b) Object model handles more complex applications.
c) ER model is useful in developing a conceptual design of a database d) All the above
113. Choose the incorrect statement from the following

(i) DBMS maintains data consistency
(ii) DBMS does not provides protection and security to the database
(iii) DBMS provides an interface to perform creation, storing and updating data in the database.
(iv) DBMS can be a square or hardware based with one sole purpose of storing data
a) ii and iv b) only ii c) i and ii d) iii and iv

114. Choose the incorrect statement from the following
a) IBM developed Hierarchical data model
b) EF Codd proposed the Relational database model
c) Network model represents the data in many-to one relationships
d) Chen developed the ER model

115. Choose the following
(i) End users are the one who manage the license keys.
(ii) DBA are the one who stores, retrieve, update and delete data.
(iii) Choosing appropriate structures to represent data and store the data in the database is done by database designers.
(iv) Application programmers are involved in developing and designing the parts of DBMs
a) ii and iv b) i and iii c) i and ii d) iii and iv

116. Choose the incorrect statement from the following.
(i) Data redundancy not present in RDBMS
(ii) DBMS uses normalization to reduce redundancy
(iii) Distributed Database not supported by RDBMS
(iv) RDBMS uses keys and indexes to establish relationship.
a) i and ii b) ii and iii c) iii and iv d) i and iv

117. _____ is an organized collection of data.
a) Database b) Record c) File d) Data

118. Which software that allows us to create, define and manipulate database.
a) DBMS b) OS c) Spreadsheet d) word

119. Which is maintaining the consistency of data can become a challenge when it live data is being continuously updated and added?
a) Reduced Redundancy b) Data consistency
c) Concurrent Access d) DBMS Supports

120. Which is called the entire collection of related data in one Table?
a) Record b) File c) Field d) database

121. Each row in a Table represents a:
a) Table b) File c) record d) field

122. Each Table column represents a:
a) Table b) File c) record d) field

123. A Table is known as:
a) Relation b) Tuple c) Attribute d) Model

124. A Row is known as:
a) Relation b) Tuple c) Attribute d) Model

125. A column is known as:
a) Relation b) Tuple c) Attribute d) Model

126. Who was developed Hierarchical model system?
a) IBM b) WIPRO c) HCL d) MICRO SOFT

127. Which model is easier and faster to access the data?
a) ER Model b) Network model
c) Relational model d) Hierarchical model

128. Who manages the complete database management system?
a) Database Administrator (DB A) b) Programmer
c) System model d) Operation Engineer

129. Which of the following is an organized collection of data?
a) Database b) Spreadsheet c) Word processor d) Worksheet

130. Which of the following characteristics of DBMS is challenged one?
a) Data redundancy b) Data security

c) Data consistency d) Data integrity

131. How many components are there in DBMS?
a) 2 b) 3 c) 4 d) 5

132. How many types of data model are there?
a) 2 b) 3 c) 4 d) 5

133. What is the basic structure of data in relational model?
a) Rows b) Tables c) Columns d) Fields

134. Which year ER - model was developed?
a) 1972 b) 1974 c) 1976 d) 1978

135. Expand GIS:
a) Geographic Information System b) Global Information System
c) Global Information Service d) Geographic Information Service

136. Expand DBA:
a) Data Base Analyst b) Data Bound Analyst
c) Data Base Administrators d) Data Base Advisor

137. How many types of relationships used in a database?
a) 2 b) 3 c) 4 d) 5

138. Expand SQL:
a) Structured Query Language b) Standard Query Language
c) Structured Quick Learner d) Standard Quick Learner

139. Which of the following data model work with Geographic Information System?
a) Class b) Object c) Database d) Data

140. How many types of users are there in DBMS?
a) 2 b) 3 c) 4 d) 5

141. Who is care of the security in DBMS?
a) DBA b) System Analyst c) Program d) Data Analyst

142. Expand RDBMS:
a) Relational Data Base Management System b) Redundancy Data Base Management System
c) Relational Data Base Multiple System d) Relative Data Base Management Service

143. Which symbol represent unary relational opration for PROJECT?
a) b)
c) + d) -

144. Which symbol represent unary relational operation for SELECT?
a) b)
c) + d) -

145. What is the main purpose of data model?
a) Idea b) Data storage c) Data Access d) Information

146. Which data model is represented as a simple tree like structure form?
a) Relational b) Hierarchical
c) Entity Relationship d) Object

147. Which key is an attribute that uniquely identifies a particular tuples?
a) Relation b) Entity c) Primary d) object

148. Which model represent a child has only one parent?
a) Relational b) Hierarchical
c) Entity Relationship d) object

149. Which model represent a child may have many parent?
a) Relational b) Hierarchical c) Network d) Object

150. Which model represent Doctor and patient?
a) Relational b) Hierarchical
c) Entity Relationship d) Object

151. Which model is easy to maintain and modify the existing code?
a) Relational b) Hierarchical
c) Entity Relationship d) Object

152. Who is involved in developing and designing the parts of DBMS?
a) Application Programmer b) Software Developer

c) Computer Operator d) (a) or (b)

153. Which type of relationship for a student can have only one exam number?
a) one-to-one b) one-to-many c) many-to-one d) many-to-many

154. Which type of relationship for a school has many students?
a) one-to-one b) one-to-many c) many-to-one d) many-to-many

155. Which type of relationship for the teachers are working in one school.
a) one-to-one b) one-to-many c) many-to-one d) many-to-many

156. Which type of relationship for students can register many courses?
a) one-to-one b) one-to-many c) many-to-one d) many-to-many

157. Which operation is used for selecting a subset with tuples according to a given condition?
a) SELECT b) PROJECT c) UNION d) CARTESIAN PRODUCT

158. Which method eliminates all attributes of the input relation but those mentioned in the projection list?
a) PROJECT ON b) SELECT c) UNION d) CARTESIAN PRODUCT

159. Which method defines a relation that contains a vertical subset of Relation?
a) PROJECTION b) SELECT c) UNION d) CARTESIAN PRODUCT

160. Which Relational algebra operation is eliminates duplicates?
a) DIFFERENCE(-) b) UNION(∪) c) INTERSECTION(∩) d) PRODUCT(x)

161. Which Relational algebra operation that includes all tuples that are in A but not in B?
a) DIFFERENCE(-) b) UNION(∪) c) INTERSECTION(∩) d) PRODUCT(x)

162. Which type of operation is helpful to merge column from two relations?
a) DIFFERENCE(-) b) UNION(∪) c) INTERSECTION(∩) d) PRODUCT(x)

ANSWER KEY

1. c) DataBase Management System
2. c) relation
3. c) Hierarchical
4. a) E F Codd
5. b) one-to-many
6. c) Edgar Frank Codd
7. d) SQLite
8. a) σ
9. b) row
10. a) Chen
11. b) Database
12. d) Database
13. c) Word
14. c) Database
15. a) Database
16. d) Database Management system
17. a) DBMS
18. c) DBMS
19. b) DBMS
20. a) CoBoL
21. b) Relationship
22. c) Normalisation
23. d) Data consistency
24. b) 5
25. c) Data model
26. a) Square
27. c) Procedures
28. d) Database Access language
29. b) (i) - 3; (ii) - 5; (iii) - 1; (iv) - 4; (v) - 2
30. a) Record
31. d) Row
32. c) column
33. b) Field
34. a) Data model
35. d) Data model
36. c) 5
36. c) 5
37. a) Redundancey model
38. c) Hierarchical model
39. d) Information Management system
40. a) Hierarchical model
41. c) Hierarchical
42. b) 1970
43. c) Tables
44. a) Relational
45. b) Network
46. d) many to many
47. a) Network
48. c) ER-model
49. b) 1976
50. d) ER model
51. c) ER-model
52. d) All of these
53. d) all of these
54. b) Geographic Information System
55. c) Object
56. d) None of these
57. a) 4
58. d) Data Base Administrators
59. a) DBA
60. b) DBA
61. c) Database designers
62. b) Relational Database Management System
63. a) Foxpro
64. d) Dbase
65. a) data model
66. c) Edgar IF Codd
67. d) E F Codd rule
68. b) 4
69. a) one to many
70. c) Relational Algebra
71. d) SQL
72. b) Structured Query Language
73. c) σ
74. a) π
75. c) +
76. d) select
76. d) select
77. c) project
78. d) PROJECT
79. b) A ∪ B
80. a) A ∩ B
81. c) Database
82. b) Information
83. a) Information
84. a) Database
85. c) DBMS
86. a) Tables
87. b) Table or file
88. d) File or table
89. a) are to many
90. a) Relation
91. b) tuple
92. c) Attribute
91. b) tuple
92. c) Attribute
93. d) Tables
94. d) rows
95. b) tuples
96. a) relation key
97. b) Field
98. a) Network
99. c) object
100. d) ER-model
101. c) Object
102. a) A - B
103. b) DBMS
104. a) A × B
105. b) E F Codd
106. c) End user
107. c) Table row = tuple
108. a) Project - π
109. b) Product - ∪
110. d) Table = Data
111. d) Data model is a simple abstraction of complex real world data gathering environment.
112. d) All the above
113. a) ii and iv
114. c) Network model represents the data in many-to one relationships
115. c) i and ii
116. b) ii and iii
117. a) Database
118. a) DBMS
119. b) Data
119. b) Data consistency
120. b) File
121. c) record
122. d) field
123. a) Relation
124. b) Tuple
125. c) Attribute
126. a) IBM
127. b) Network model
128. a) Database Administrator (DBA)

129. a) Database 130. c) Data consistency 131. d) 5 132. d) 5 133. b) Tables 134. c) 1976 135. a) Geographic Information System 136. a) Data Base Analyst 137. c) 4 138. c) Structured Quick Learner 139. b) Object 140. c) 4 141. a) DBA 142. a) Relational Data Base Management System 143. c) + 144. a) 145. a) Idea 146. b) Hierarchical	147. a) Relation 148. b) Hierarchical 149. c) Network 150. d) Object 151. d) Object 151. d) (a) or (b) 152. a) one-to-one 153. a) one-to-one 154. b) one-to-many 155. c) many-to-one 156. d) many-tomany 157. a) SELECT 158. a) PROJECT ON 159. a) PROJECTION 160. b) UNION(∪) 161. a) DIFFERENCE(-) 162. d) PRODUCT(x)

PART B

1. Mention few examples of a database.

Foxpro, dbase

2. What is data consistency?

Data Consistency means that data values are the same at all instances of a database

3. What is normalization?

- Normalization reduces data redundancy and improves data integrity.
- Database Normalization was proposed by Dr.Edgar F Codd

4. Differentiate data and information.

Data:

Data are raw facts stored in a computer. A data may contain any character, text, word or a number.

Example : 600006, DPI Campus, SCERT, Chennai, College Road

Information:

Information is formatted data, which allows to be utilized in a signifi cant way.

Example SCERT College Road DPI Campus Chennai 600006

5. What is E F Codd rules?

Database normalization was first proposed by **Dr. Edgar F Codd** as an integral part of RDBMS in order to reduce data redundancy and improve data integrity. These rules are known as E F Codd Rules.

6. Write a note on (i) SELECT Operation (ii) PROJECT Operation

SELECT (symbol : σ)

General form σ_c (R) with a relation R and a condition C on the attributes of R.

The SELECT operation is used for selecting a subset with tuples according to a given condition.

PROJECT (symbol : Π) eliminates

7. What is the difference between Hierarchical and Network data model?

Hierarchical model:

Hierarchical model is a simple tree like structure form with one-to-one relationship called parent-child relationship

Network model:

Network model is similar to Hierarchical model but it allows a record to have more than one parent

8. What is database?

Database is a repository collection of related data organized in a way that data can be easily accessed, managed and updated. Database can be a soft ware or hardware based, with one sole purpose of storing data.

9. List the characteristics of DBMS.

- Data stored into tables
- Reduced redundancy
- Data Consistency
- Support multiple user and concurrent access
- Query Language.
- Security
- DBMS supports transactions

10. Write a note on (i) SELECT Operation (ii) PROJECT Operation

SELECT (symbol : σ)

- General form σ_c (R) with a relation R and a condition C on the attributes of R.
- The SELECT operation is used for selecting a subset with tuples according to a given condition.

PROJECT (symbol : Π)

- The projection eliminates all attributes of the input relation but those mentioned in the projection list.
- The projection method defines a relation that contains a vertical subset of Relation

11. What is an object model?

Object model stores the data in the form of objects, attributes and methods, classes and Inheritance. This model handles more complex applications, such as Geographic information System (GIS), scientific experiments, engineering design and manufacturing.

12. What are unary Relational operations in Relational Algebra?

- Unary Relational Operations are
- SELECT (symbol : σ)
- PROJECT (symbol : Π)

13. What are types of data model?

- Hierarchical Model
- Relational Model
- Network Database Model
- Entity Relationship Model
- Object Model

14. What are different types of Relationship?

1. One-to-One Relationship
2. One-to-Many Relationship
3. Many-to-One Relationship
4. Many-to-Many Relationship

15. List some examples of RDBMS.

Examples of RDBMS are mysql, oracle, sql server, ibm db2

16. What is the difference between Hierarchical and Network data model?

Hierarchical model:

Hierarchical model is a simple tree like structure form with one-to-one relationship called parent-child relationship

Network model:

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18. List the characteristics of DBMS.

- Data stored into tables
- Reduced redundancy
- Data Consistency
- Support multiple user and concurrent access

- Query Language.
- Security
- DBMS supports transactions

19. Write the components of the Database management system?

- 1.Hardware
- 2.Software
- 3.Data
- 4.P r o c e du r e s / Me t h o d s
- 5.Database Access Languages

20. What is the roll of End user?

All modern applications, web or mobile, store user data. Applications are programmed in such a way that they collect user data and store the data on DBMS systems running on their server. End users are the one who store, retrieve, update and delete data.

21. What are Relational Algebra operations from set theory?

- UNION (∪)
- INTERSECTION (∩)
- DIFFERENCE (−)
- CARTESIAN PRODUCT (X)

PART C

1. What is the difference between Select and Project command?

SELECT (symbol : σ)

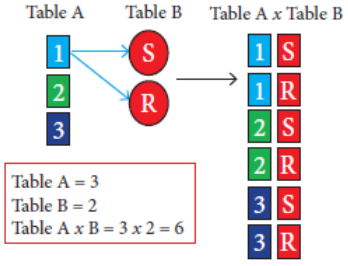
- General form σ_c (R) with a relation R and a condition C on the attributes of R.
- The SELECT operation is used for selecting a subset with tuples according to a given condition.

PROJECT (symbol : Π)

- The projection eliminates all attributes of the input relation but those mentioned in the projection list.
- The projection method defines a relation that contains a vertical subset of Relation

2. Explain Cartesian Product with a suitable example.

- Cross product is a way of combining two relations. The resulting relation contains, both relations being combined.
- A x B means A times B, where the relation A and B have different attributes.
- This type of operation is helpful to merge columns from two relations.



Cartesian Product
Fig. 11.12

Table A		Table B	
studno	**name**	**studno**	**subject**
cs1	Kannan	cs28	Big Data
cs2	Gowri Shankar	cs62	R language
cs4	Padmaja	cs25	python programming

Table 11.3

Cartesian product : Table A x Table B

studno	name	course	subject
cs1	Kannan	cs28	Big Data
cs1	Kannan	cs62	R language
cs1	Kannan	cs25	python rogramming
cs2	Gowri Shankar	cs28	Big Data
cs2	Gowri Shankar	cs62	R language
cs2	Gowri Shankar	cs25	python programming
cs4	Padmaja	cs28	Big Data
cs4	Padmaja	cs62	R language
cs4	Padmaja	cs25	python programming

3. Write a note on different types of DBMS users.

Database Administrators

Database Administrator or DBA is the one who manages the complete database management system. DBA takes care of the security of the DBMS, managing the license keys, managing user accounts and access etc.

Application Programmers or Software Developers

This user group is involved in developing and designing the parts of DBMS.

End User

All modern applications, web or mobile, store user data. Applications are programmed in such a way that they collect user data and store the data on DBMS systems running on their server. End users are the one who store, retrieve, update and delete data.

Database designers:

Database designers are responsible for identifying the data to be stored in the database for choosing appropriate structures to represent and store the data.

4. Write a note on DBMS.

A DBMS is a soft ware that allows us to create, defi ne and manipulate database, allowing users to store, process and analyze data easily. DBMS provides us with an interface or a tool, to perform various operations to create a database, storing of data and for updating data, etc. DBMS also provides protection and security to the databases. It also maintains data consistency in case of multiple users.

5. Write the importance of using data model.

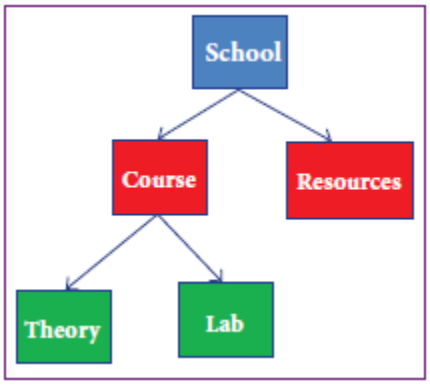
- A data model describes how the data can be represented and accessed from a software after complete implementation .
- It is a simple abstraction of complex real world data gathering environment.
- The main purpose of data model is to give an idea as how the final system or software will look like after development is completed.

6. Explain the data model that represent parent child relationship.

Hierarchical Model

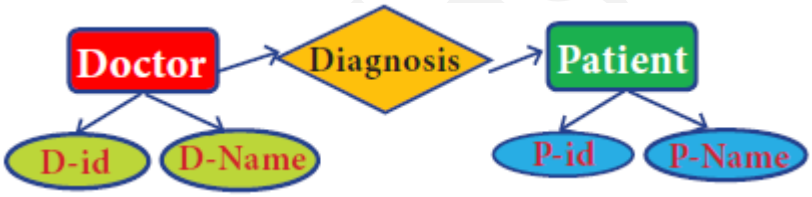
Hierarchical model was developed by IBM as Information Management System.

In Hierarchical model, data is represented as a simple tree like structure form. This model represents a one-to-many relationship ie parent-child relationship. One child can have only one parent but one parent can have many children. This model is mainly used in IBM Main Frame computers.



7. Write a short note on the database model, in which relationship are created by dividing the object into entity.

- In this database model, relationship are created by dividing the object into entity and its characteristics into attributes.
- It was developed by Chen in 1976. This model is useful in developing a conceptual design for the database. It is very simple and easy to design logical view of data. The developer can easily understand the system by looking at ER model constructed.
- Rectangle represents the entities. E.g. Doctor and Patient
- Ellipse represents the attributes E.g. D-id, D-name, P-id, P-name. Attributes describes the characteristics and each entity becomes a major part of the data stored in the database.
- Diamond represents the relationship in ER diagrams
- E.g. Doctor diagnosis the Patient



8. What is Relational Algebra?

Relational Algebra, was first created by **Edgar F Codd** while at IBM. It was used for modeling the data stored in relational databases and defining queries on it.
Relational Algebra is a procedural query language used to query the database tables using SQL.
Relational algebra operations are performed recursively on a relation (table) to yield an output. The output of these operations is a new relation, which might be formed by one or more input relations.
Relational Algebra is divided into various groups

Unary Relational Operations

- SELECT (symbol : σ)
- PROJECT (symbol : Π)

Relational Algebra Operations from Set Theory

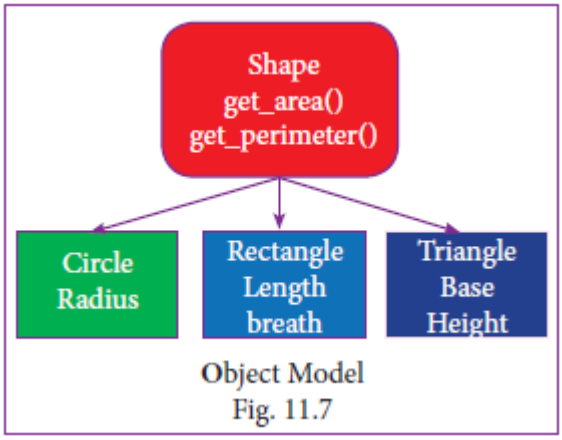
- UNION (∪)
- INTERSECTION (∩)
- DIFFERENCE (−)
- CARTESIAN PRODUCT (X)

9. What is the role of DBA?

Database Administrator or DBA is the one who manages the complete database management system. DBA takes care of the security of the DBMS, managing the license keys, managing user accounts and access etc.

10. Explain Object Model with example.

Object model stores the data in the form of objects, attributes and methods, classes and Inheritance. This model handles more complex applications, such as Geographic information System (GIS), scientific experiments, engineering design and manufacturing. It is used in file Management System. It represents real world objects, attributes and behaviors. It provides a clear modular structure. It is easy to maintain and modify the existing code.



Object Model
Fig. 11.7

An example of the Object model is **Shape, Circle, Rectangle** and **Triangle** are all objects in this model.

- **Circle** has the attribute **radius.**
- **Rectangle** has the attributes **length and breadth.**
- **Triangle** has the attributes **base and height** .

The objects Circle, Rectangle and Triangle **inherit** from the object Shape.

11. What does the term database refers?

A database is an organized collection of data, generally stored and accessed electronically from a computer system. Th e term "database" is also used to refer to any of the DBMS, the database system or an application associated with the database. Because of the close relationship between them, the term "database" is oft en used casually to refer to both a database and the DBMS used to manipulate it.

12. Write a note on database structure.

- Table is the entire collection of related data in one table, referred to as a File or Table where the data is organized as row and column.
- Each row in a table represents a record, which is a set of data for each database entry.
- Each table column represents a Field, which groups each piece or item of data among the records into specific categories or types of data. Eg. StuNo., StuName, StuAge, StuClass, StuSec.
- A Table is known as a RELATION
- A Row is known as a TUPLE
- A column is known as an ATTRIBUTE

13. Write a short note on Relational data model.

Relational Model

The Relational Database model was first proposed by E.F. Codd in 1970 . Nowadays, it is the most widespread data model used for database applications around the world.

The basic structure of data in relational model is tables (relations). All the information's related to a particular type is stored in rows of that table. Hence tables are also known as relations in a relational model. A relation key is an attribute which uniquely identifies a particular tuple

Stu_id	Name	Age
1	Malar	17
2	Suncar	16
3	Velu	16

Subj_id	Name	Teacher
1	C++	Kannan
2	Php	Ramakrishnan
3	Python	Vidhya

Stu_id	Subj_id	Marks
1	1	92
1	2	89
3	2	96

PART D

1. Explain the different types of data model.

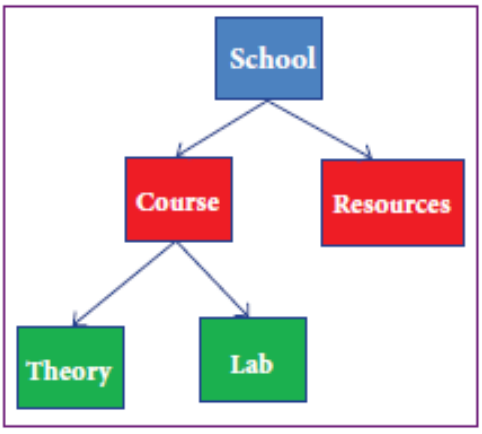
Types of Data Model

Following are the different types of a Data Model

- Hierarchical Model
- Relational Model
- Network Database Model
- Entity Relationship Model
- Object Model

Hierarchical Model :

- Hierarchical model was developed by IBM as Information Management System.
- In Hierarchical model, data is represented as a simple tree like structure form.
- This model represents a one-to-many relationship ie parent-child relationship.
- One child can have only one parent but one parent can have many children.
- This model is mainly used in IBM Main Frame computers.



Relational Model :

- The Relational Database model was first proposed by E.F. Codd in 1970 .
- Nowadays, it is the most widespread data model used for database applications around the world.
- The basic structure of data in relational model is tables (relations).

- All the information's related to a particular type is stored in rows of that table. Hence tables are also known as relations in a relational model.
- A relation key is an attribute which uniquely identifies a particular tuple

Stu_id	Name	Age
1	Malar	17
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3	Velu	16

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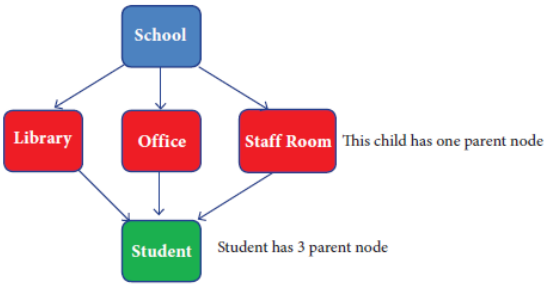
1	C++	Kannan
2	Php	Ramakrishnan
3	Python	Vidhya

Stu_id	Subj_id	Marks
1	1	92
1	2	89
3	2	96

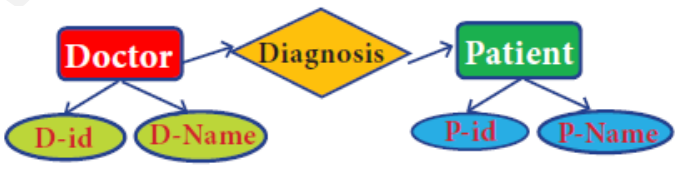
Network Model :

- Network database model is an extended form of hierarchical data model. The difference between hierarchical and Network data model is :
- In hierarchical model, a child record has only one parent node.
- In a Network model, a child may have many parent nodes. It represents the data in many-to-many relationships.
- This model is easier and faster to access the data.



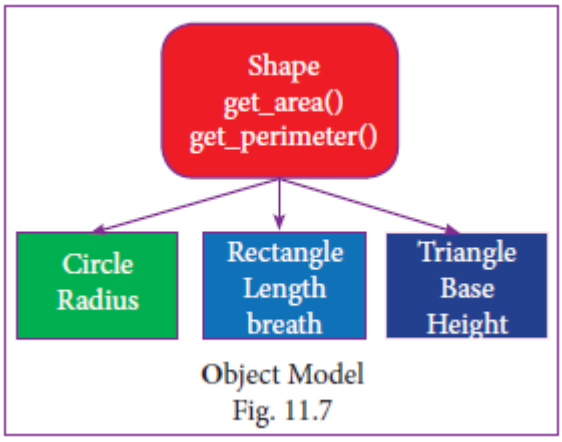
Database Model :

- In this database model, relationship are created by dividing the object into entity and its characteristics into attributes.
- It was developed by Chen in 1976. This model is useful in developing a conceptual design for the database. It is very simple and easy to design logical view of data. The developer can easily understand the system by looking at ER model constructed.
- Rectangle represents the entities. E.g. Doctor and Patient
- Ellipse represents the attributes E.g. D-id, D-name, P-id, P-name. Attributes describes the characteristics and each entity becomes a major part of the data stored in the database.
- Diamond represents the relationship in ER diagrams
- E.g. Doctor diagnosis the Patient



Object Model :

Object model stores the data in the form of objects, attributes and methods, classes and Inheritance. This model handles more complex applications, such as Geographic information System (GIS), scientific experiments, engineering design and manufacturing. It is used in file Management System. It represents real world objects, attributes and behaviors. It provides a clear modular structure. It is easy to maintain and modify the existing code.



Object Model
Fig. 11.7

An example of the Object model is **Shape, Circle, Rectangle** and **Triangle** are all objects in this model.

- **Circle** has the attribute **radius.**
- **Rectangle** has the attributes **length and breadth.**
- **Triangle** has the attributes **base and height** .

The objects Circle, Rectangle and Triangle **inherit** from the object Shape.

2. Explain the different types of relationship mapping.

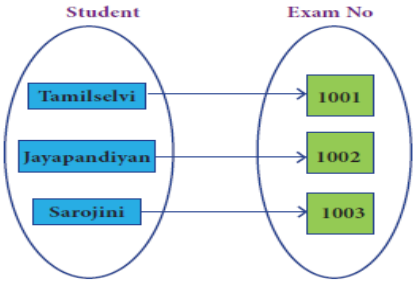
Types of Relationships

Following are the types of relationships used in a database.

1. One-to-One Relationship
2. One-to-Many Relationship
3. Many-to-One Relationship
4. Many-to-Many Relationship

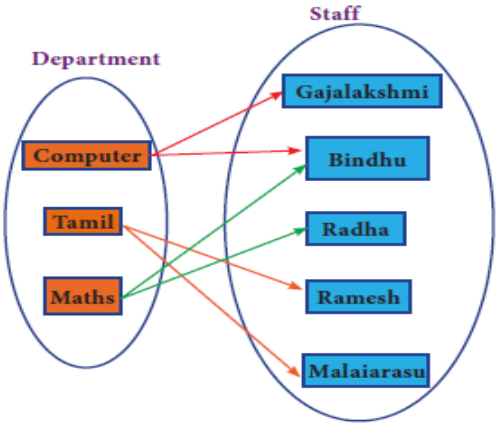
1.One-to-One Relationship

- In One-to-One Relationship, one entity is related with only one other entity. One row in a table is linked with only one row in another table and vice versa.
- For example: A student can have only one exam number



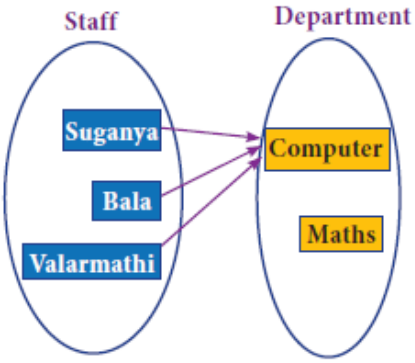
2. One-to-Many Relationship

- In One-to-Many relationship, one entity is related to many other entities.
- One row in a table A is linked to many rows in a table B, but one row in a table B is linked to only one row in table A.
- For example: One Department has many staff members.



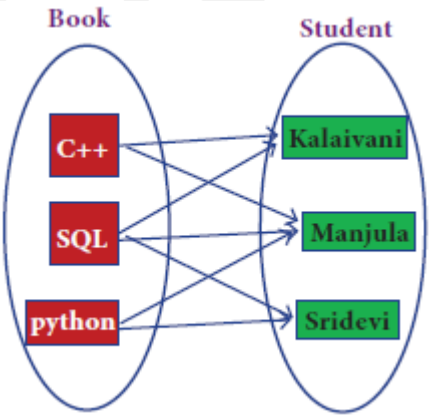
3. Many-to-One Relationship

- In Many-to-One Relationship, many entities can be related with only one in the other entity.
- For example: A number of staff members working in one Department.
- Multiple rows in staff members table is related with only one row in Department table.



4. Many-to-Many Relationship

A many-to-many relationship occurs when multiple records in a table are associated with multiple records in another table.



3. Differentiate DBMS and RDBMS.

	DBMS	**RDBMS**
Expansion	Database Management System	Relational DataBase Management System
Data storage	Navigational model ie data by linked records	Relational model (in tables). ie data in tables as row and column
Data redundancy	Exhibit	Not Present
Normalization	Not performed	RDBMS uses normalization to reduce redundancy
Data access	Consumes more time	Faster, compared to DBMS.
Keys and indexes	Does not use.	used to establish relationship. Keys are used in RDBMS.
Transaction management	Inefficient, Error prone and insecure.	Efficient and secure.

Distributed Databases	Not supported	Supported by RDBMS.
Example	Dbase, FoxPro.	SQL server, Oracle, mysql, MariaDB, SQLite.

4. Explain the different operators in Relational algebra with suitable examples.

Relational Algebra is divided into various groups

Unary Relational Operations

- SELECT (symbol : σ)
- PROJECT (symbol : Π)

Relational Algebra Operations from Set Theory

- UNION (∪)
- INTERSECTION (∩)
- DIFFERENCE (−)
- CARTESIAN PRODUCT (X)

SELECT (symbol : σ)

General form σ_c (R) with a relation R and a condition C on the attributes of R.

The SELECT operation is used for selecting a subset with tuples according to a given condition. Select filters out all tuples that do not satisfy C.

STUDENT

Studno	Name	Course	Year
cs1	Kannan	Big Data	II
cs2	Gowri Shankar	R language	I
cs3	Lenin	Big Data	I
cs4	Padmaja	Python Programming	I

Table 11.1

σ_{course} = "Big Data" (STUDENT)

Studno	Name	Course	Year
cs1	Kannan	Big Data	II
cs3	Lenin	Big Data	I

PROJECT (symbol : Π)

The projection eliminates all attributes of the input relation but those mentioned in the projection list. The projection method defines a relation that contains a vertical subset of Relation.

Example

Π_{course} (STUDENT)

Result

Course
Big Data
R language
Python Programming

UNION (Symbol :∪)

- It includes all tuples that are in tables A or in B. It also eliminates duplicates. Set A Union Set B would be expressed as A ∪ B
- Example**:**

Consider the following tables

Table A	
Studno	**Name**
cs1	Kannan
cs3	Lenin
cs4	Padmaja

Table B	
Studno	**Name**
cs1	Kannan
cs2	GowriShankarn
cs3	Lenin

Table 11.2

Result

Table A ∪ B	
Studno	**Name**
cs1	Kannan
cs2	GowriShankar
cs3	Lenin
cs4	Padmaja

SET DIFFERENCE (Symbol : -)

- The result of A – B, is a relation which includes all tuples that are in A but not in B.
- The attribute name of A has to match with the attribute name in B.
- Example

Result

Table A – B	
cs4	Padmaja

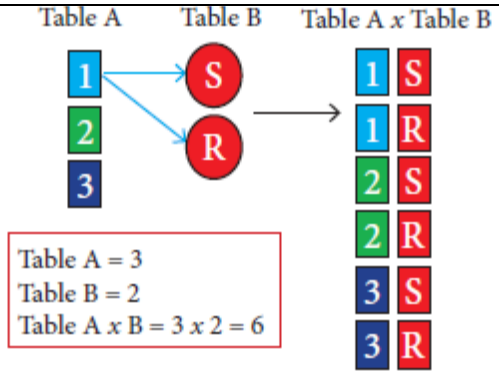
INTERSECTION (symbol : ∩) A ∩ B

Defines a relation consisting of a set of all tuple that are in both in A and B. However, A and B must be union-compatible.
Example

A ∩ B	
cs1	Kannan
cs3	Lenin

PRODUCT OR CARTESIAN PRODUCT (Symbol : X)

Cross product is a way of combining two relations. The resulting relation contains, both relations being combined.
A x B means A times B, where the relation A and B have different attributes.
This type of operation is helpful to merge columns from two relations.



Cartesian Product
Fig. 11.12

Table A		Table B	
studno	**name**	**studno**	**subject**
cs1	Kannan	cs28	Big Data
cs2	Gowri Shankar	cs62	R language
cs4	Padmaja	cs25	python programming

Cartesian product : Table A x Table B

studno	name	course	subject
cs1	Kannan	cs28	Big Data
cs1	Kannan	cs62	R language
cs1	Kannan	cs25	python rogramming
cs2	Gowri Shankar	cs28	Big Data
cs2	Gowri Shankar	cs62	R language
cs2	Gowri Shankar	cs25	python programming
cs4	Padmaja	cs28	Big Data
cs4	Padmaja	cs62	R language
cs4	Padmaja	cs25	python programming

5. Explain the characteristics of DBMS.

1. Data stored into Tables

Data is never directly stored into the database. Data is stored into tables, created inside the database. DBMS also allows to have relationship between tables which makes the data more meaningful and connected.

2. Reduced Redundancy

In the modern world hard drives are very cheap, but earlier when hard drives were too expensive, unnecessary repetition of data in database was a big problem But DBMS follows Normalisation which divides the data in such a way that repetition is minimum.

3.Data Consistency

On live data, it is being continuously updated and added, maintaining the consistency of data can become a challenge. But DBMS handles it by itself.

4. Support Multiple user and Concurrent Access	DBMS allows multiple users to work on it(update, insert, delete data) at the same time and still manages to maintain the data consistency.
5.Query Language	DBMS provides users with a simple query language, using which data can be easily fetched, inserted, deleted and updated in a database.
6. Security	The DBMS also takes care of the security of data, protecting the data from unauthorized access. In a typical DBMS, we can create user accounts with different access permissions, using which we can easily secure our data by restricting user access.
7. DBMS Supports Transactions	It allows us to better handle and manage data integrity in real world applications where multi-threading is extensively used.

6. Explain the components of DBMS.

Components of DBMS

The Database Management System can be divided into five major components as follows:

1.Hardware
2.Software
3.Data
4 . P r o c e du r e s / Me t h o d s
5.Database Access Languages

1. Hardware: The computer, hard disk, I/O channels for data, and any other physical component involved in storage of data

2. Software: This main component is a program that controls everything. The DBMS software is capable of understanding the Database Access Languages and interprets into database commands for execution.

3. Data: It is that resource for which DBMS is designed. DBMS creation is to store and utilize data.

4. Procedures/Methods: They are general instructions to use a database management system such as installation of DBMS, manage databases to take backups, report generation, etc.

5. DataBase Access Languages: They are the languages used to write commands to access, insert, update and delete data stored in any database.

Examples of popular DBMS: Dbase, FoxPro

CHAPTER 12
STRUCTURED QUERY LANGUAGE
PART A

1. Which commands provide definitions for creating table structure, deleting relations, and modifying relation schemas. a) DDL b) DML c) DCL d) DQL
2. Which command lets to change the structure of the table?
   a) SELECT b) ORDER BY c) MODIFY d) ALTER
3. The command to delete a table is
   a) DROP b) DELETE c) DELETE ALL d) ALTER TABLE
4. Queries can be generated using
   a) SELECT b) ORDER BY c) MODIFY d) ALTER
5. The clause used to sort data in a database
   a) SORT BY b) ORDER BY c) GROUP BY d) SELECT
6. Which of the following is a standard programming language to access and manipulate databases?
   a) MySQL b) Python c) SQL d) PHP

7. Which of the following language was designed for managing and accessing data in RDBMS?
   a) SQL b) DBMS c) DDL d) DML
8. SQL stands for
   a) Standard Query Language b) Secondary Query Language
   c) Standard Question Language d) Structural Query Language
9. SQL originally called as
   a) SQL b) DBMS c) RDBMS d) SQLITE
10. Latest SQL standard as of now is
   a) SQL 2008 b) SQL 2009 c) SQL 2018 d) SQL 2.0
11. Find out the odd man out :
   a) MS SQL servers b) Dbase
   c) Microsoft Access d) IBM DB2
12. Which of the following is not a RDBMS package?
   a) Foxpro b) MySQL c) DBbase d) a and c
13. The data in RDBMS, is stored in database objects called
   a) Queries b) Languages c) Tables d) Relations
14. Which of the following is a collection of data entries?
   a) Table b) Database c) Dbase d) SQL
15. The specific related information about every record in the table is maintained by
   a) language b) field c) relation d) tuple
16. DDL expansion is
   a) Data Definition Language b) Data Defined Language
   c) Definition Data Language d) Dictionary Data Language
17. DML stand for
   a) Data Management Language b) Directional Manipulate Language
   c) Data Manipulation language d) Data Meaningful Language
18. Which of the following processing skills of SQL provides commands for defining relation schemes?
   a) MySQL b) DDL c) DML d) DCL
19. Which component of SQL includes commands to insert, delete and modify tables in database?
   a) DCL b) TCL c) DDL d) DML
20. Which processing skills of SQL includes commands of access rights to creations and views of tables?
   a) View definition b) Transaction control c) Authorization d) Integrity
21. WAMP stands for
   a) Windows, Apache, MySQL, PHP b) Windows, Android, MySQL, PHP
   c) Windows, Apache, MySQL, Python d) Windows, APL, MySQL, PHP
22. Which of the following used to serve live websites?
   a) WAMP b) Windows c) Google d) Google Chrome
23. Into how many categories the SQL commands are divided?
   a) 3 b) 4 c) 5 d) 7
24. Which of the following is not a category of SQL command?
   a) TCL b) DDL c) DQL d) DML
25. DCL stands for
   a) Dynamic Control Language b) Data Communication Language
   c) Dynamic Data Control Language d) Data Control Language
26. TCL stands for
   a) Transmission Control Language b) Transaction control Language
   c) Transaction Communication Language d) Transfer Communication Language
27. DQL Stands for
   a) Database Query Language b) Dynamic Query Language
   c) Data Query Language d) Defined Query Language
28. Which of the following component simply deals with description of the database schema?
   a) DML b) DDL c) DCL d) DQL
29. Which component provides a self definitions to specify storage structure used by the database system?
   a) DML b) DQL c) TCL d) DDL
30. Which of the following is not a SQL DDL commands?

a) Grant b) Alter c) Drop d) Truncate

31. The SQL DDL command removes all records from a table and also release the space occupied by these records is

a) Delete b) Drop c) Truncate d) Rollback

32. Which of the following SQL DDL command that delete tables from database?

a) Rollback b) Drop c) Delete d) Truncate

33. Which of the following is not a type of DML?

(i) Procedural DML

(ii) Non-Procedural DML

(iii) Programmable DML

a) i only b) ii only c) iii only d) ii and iii

34. Which DML requires a user to specify what data is needed without specifying how to get it?

a) Produced DML b) Procedural DQL c) Programmable DML d) Non-Procedural DML

35. The SQL DML command used remove all records from a table but not the space occupied by them is

a) Drop b) Truncate c) Delete d) Del

36. Which of the following used to control the access of data stored in a database?

a) DCL b) DML c) DDL d) DQL

37. Which of the following SQL DCL command gives permission to one or more users to perform specific tasks?

a) GRANT b) GIVE c) WHERE d) ORDER

38. The SQL DCL command withdraws the access permission given by the GRANT statement is

a) WITHDRAWN b) REMOVE c) REVOKE d) DELETE

39. Revoke command belongs to

a) DML b) DDL c) DQL d) DCL

40. Which of the following commands are used to manage the changes made to the data in table by DML statements?

a) DLL b) TCL c) DML d) DDL

41. The SQL TCL command saves any transaction into the data permanently is

a) Save point b) Save As c) Commit d) Save

42. Which of the following is not a SQL TCL command?

a) Revoke b) Commit c) Roll back d) Save point

43. The SQL DQL command used to display all the records from the table is

a) Select b) display c) Show d) Select all

44. Which SQL TCL command save a transaction temporarily

a) Commit b) Roll back c) Save point d) None of these

45. Which of the following command used to retrieve data from a database?

a) DQL b) DDL c) DML d) DCL

46. The data in a database is stored based on the kind of value stored is known as

a) language b) datatype c) function d) record

47. Which of the following SQL standard recognized only Text and Number data type?

a) DCL b) DML c) ANSI d) TCL

48. Which of the following data type same as real expect the precision may exceed 64?

a) float b) real c) long real d) double

49. Double data type precision may exceed

a) 64 b) 74 c) 54 d) 14

50. Which of the following is not a SQL predetermined set of commands to work on databases?

a) keywords b) commands c) clause d) alters

51. Which of the following SQL predetermined commands are understood as instructions?

a) Keywords b) Arguments c) Commands d) Clause

52. Which of the following have a special meaning in SQL?

a) Arguments b) Clause c) Keywords d) Commands

53. Which of the following begin with a keyword and consists of keyword and argument?

a) Commands b) Clauses c) Statement d) Data

54. Which of the following SQL DDL command used to create a table?

a) CREATE b) DDL TABLE c) CREATE TABLE d) NEW TABLE

55. Which of the following must be specified when a table is created?

a) column name b) datatype c) Size d) all of these

56. Which of the following are used to limit the type of data that can go into a table?
a) Commands b) Arguments c) Constraint d) Keywords

57. Which of the following ensures the accuracy and reliability of the data in the database?
a) Constraint b) Table c) Classes d) Data types

58. Which constraint apply to a group of one or more columns?
a) Column b) Default c) Table d) Unique

59. The constraint enforces a field to always contain a value is
a) NULL b) NOT NULL c) YES d) ALWAYS

60. How many types of database integrity constraints are there?
a) 5 b) Multiple c) 3 d) 4

61. Which of the following is not a database integrity constraint?
a) Check b) Table c) Unique d) Default

62. Which of the following constraint ensures that no two rows have the same value in the specified columns?
a) Unique b) Primary key c) Check d) Default

63. Which of the following ensures database integrity constraints?
a) Keywords b) Constraint c) Keys d) Table

64. Defined multiple constraints are separated by
a) comma b) colon c) semicolon d) space

65. Which of the following should be added at the end of field definition?
a) space b) semicolon c) comma d) colon

66. Which of the following constraint helps to uniquely identify a record in the database?
a) Primary key b) Default c) Unique d) Check

67. Which of the following constraint does not allow NULL values?
a) Primary key b) Check c) Unique d) a and b

68. Which of the following keyword shows that the field value cannot be empty?
a) NULL b) NO VALUE c) NOT NULL d) NO NULL

69. Which constraint helps to set a limit value placed for a field?
a) Default b) Key c) Unique d) Check

70. Which of the following constraint use relational and logical operators for condition?
a) Primary Key b) Check c) Unique d) Table

71. Which of the following constraint is applied to a group of field of the table?
a) Primary Key b) Unique c) Properties d) Table

72. The constraint defined only at the end of table definition is
a) Check b) Table c) Unique d) Primary Key

73. Which of the following command helps to add new records to the table?
a) Insert b) Add New c) Add row d) Insert new

74. In the INSERT command the fields that are omitted will have
a) default value b) Null value c) No value d) a or b

75. The command to delete all the rows in the table is
a) DELETE ALL FROM tablename b) DELETE tablename
c) DELETE * FROM tablename ALL d) DELETE * FROM tablename

76. Which of the following command replaces some or all data values in a database?
a) REPLACE b) UPDATE c) SET d) none of these

77. Which keywords are not used in the command used to replace a data value in a database?
a) UPDATE b) SET c) ADD d) WHERE

78. To update multiple fields with the SET clause in UPDATE command the field shout be separated by
a) comma b) space c) colon d) semi-colon

79. Which of the following keyword not used in ALTER command?
a) ADD b) DROP COLUMN c) MODIFY d) SET

80. Which of the following command not used to delete a table?
a) REMOVE b) DELETE c) TRUNCATE d) DROP

81. Which command is used to query or retrieve data from a table in the database?
a) QUERY b) SELECT c) RETRIEVE d) CREATE

82. Which command is used to retrieve a subset of records from one or more tables?

a) QUERY b) SUBSET c) SELECT d) SET

83. Which of the following keyword used in SELECT command that helps to eliminate redundant data?
a) ELIMINATE b) REDUNDANT c) DUPLICATE d) DISTINCT

84. Which keyword used in SELECT command that retains duplicate rows?
a) DISTINCT b) NULL c) RETAIN d) ALL

85. The clause in the SELECT command specifies the criteria for getting the desired result is
a) CHECK b) WHERE c) DISTINCT d) DESIRED

86. Which keyword is used to specify the list of values which must be matched with the record values?
a) NOT IN b) BETWEEN c) IN d) NOT BETWEEN

87. The keyword used to SELECT command displays only those records that do not match in the list is
a) IN NOT b) NOT IN c) NOT BETWEEN d) NOT WHERE

88. The keyword used to sort the records in ascending order is
a) ASCD b) ASD c) ASC d) ASCE

89. The clause used to filter the records in the table is
a) WHERE b) ORDER c) FILTER d) GROUP

90. Which clause helps to extract only those records which statify the given condition?
a) EXTRACT b) COMMIT c) WHERE d) GROUP

91. Which keyword is used to divide the table into groups?
a) DIVIDE BY b) GROUP BY c) ORDER BY d) HAVING

92. Which clause SELECT command is used to produce summary report form the database
a) REPORT BY b) WHERE BY c) ORDER BY d) GROUP BY

93. Which clause can be used along with GROUP BY clause and SELECT statement to include aggregate function on them? a) WHERE b) HAVING c) FROM d) COMMIT

94. _____ allows the user to create, retrieve, alter and transfer information among databases?
a) EDBMS b) DDL c) SQL d) DBMS

95. A _____ supports the development, administration and use of database platforms.
a) SQL b) CRUD c) MySQL d) DBMS

96. RDBMS is a type of _____ with a row based table structure that connects related data elements
a) DBMS b) SQL c) Informix d) CRUD

97. A _____ consists of row and columns.
a) Database b) DBMS c) SQL d) Table

98. A _____ is a collection of related fields in a table.
a) Attributes b) Record c) Relations d) SQL

99. After the database has been created, the data can be manipulated using _____ procedures.
a) TCL b) DCL c) DML d) DQL

100. The DML is basically of _____ types
a) 3 b) 4 c) 2 d) 5

101. _____ is used for controlling privileges in the database?
a) DCL b) DQL c) DML d) DDL

102. All the values in a given field must be of same _____.
a) command b) name c) record d) datatype

103. Minimum _____ colomn is required to create a table.
a) one b) two c) three d) four

104. The Primary key constraint is similar to _____ constraint.
a) Default b) Unique
c) Check d) none of the these

105. _____ is a condition application on a field or set of fields?
a) Class b) Control structure
c) Constraint d) Arguments

106. The _____ command is used to modify the table structure (schem a)
a) CHANGE b) MODIFY c) ALTER d) REPLACE

107. A _____ is a command to get a desired result from the database table.
a) TABLE b) REPORT c) FORM d) QUERY

108. The _____ keyword is used along with the SELECT command to eliminate duplicate rows in the table?
a) DUPLICATE b) DISTINCT c) ELIMINATE d) a or b

109. The _____ keyword defines a range of values the record must fall into make the condition true.
a) BETWEEN b) RANGE c) IN d) WHERE
110. The NULL value in the field can be searched in a table using the _____ in the WHERE clause.
a) = = NULL b) NULL c) NOT NULL d) ISNULL
111. The _____ symbol is used with the COUNT to induce the NULL values.
a) + b) >= c) * d) =
112. _____ is used with SAVEPOINT command to jump to a particular savepoint location.
a) COMMINT b) WHERE c) ROLLBACK TO d) HAVING
121. The data in RDBMS, is stored in database objects, called:
a) Tables b) Columns c) Rows d) Fields
122. Which skills the SQL provides forms for checking using condition?
a) View b) Integrity
c) Authorization d) Transaction control
123. MySQL is a:
a) SQL b) System software
c) RDBMS d) High level language
124. LAMP is a:
a) Serve live website b) Data Definition Language
c) Data Manipulation Language d) overnment website
125. Which command is used to remove all records from a table, also release space occupied by those records?
a) Create b) Alter c) Drop d) Truncate
126. Which command is used delete all records from a table, but not the space occupied by them?
a) Delete b) Alter c) Drop d) Truncate
127. Which command is used to save any transaction into the database permanently?
a) Grant b) Commit c) Rollback d) Savepoint
128. Which command is used Restore the database to last commit state?
a) Grant b) Commit c) Rollback d) Savepoint
129. Which command is used temporarily save a transaction?
a) Grant b) Commit c) Rollback d) Savepoint
130. How many types of constraints ensure database integrity?
a) 2 b) 3 c) 4 d) 5
131. Which constraint can be applied only to fields?
a) UNIQUE b) PRIMARY KEY c) DEFAULT d) CHECK
132. Which constraint declares a field as a primary key?
a) UNIQUE b) PRIMARY KEY c) DEFAULT d) CHECK
133. Which constraint helps to set a limit value placed for a field?
a) UNIQUE b) PRIMARY KEY c) DEFAULT d) CHECK
134. Which constraint is applied to a gi-oup fields?
a) UNIQUE b) TABLE c) DEFAULT d) CHECK
135. Which DML command helps to add new data to the database?
a) INSERT b) UPDATE c) ALTER d) DROP
136. Which keyword is used to update multiple fields?
a) ALTER b) SET c) DROP d) INSERT
137. Which DDL command can also be used to remove all columns?
a) ALTER b) DROP c) DELETE d) TRUNCATE
138. Which DDL command deletes only the rows, from the table?
a) DELETE b) TRUNCATE c) DROP d) REMOVE
139. Which DDL command is used to delete all the rows, the structure remains in the table?
a) DELETE b) TRUNCATE c) DROP d) REMOVE
140. Which DDL command is used to remove an object from the database?
a) DELETE b) TRUNCATE c) DROP d) REMOVE
141. Which DQL command helps to eliminate duplicate rows in the Table?
a) DISTINCT b) ALL c) BETWEEN d) IN
142. Which DQL keyword retains duplicate rows?
a) DISTINCT b) ALL c) BETWEEN d) IN

143. Which DQL keyword defines a range of values?
a) DISTINCT b) ALL c) BETWEEN d) IN
144. Which DQL keyword is used to specify a list of values which must be matched with the record values?
a) DISTINCT b) ALL c) BETWEEN d) IN
145. Which DQL clause in SQL is used to sort the data in either ascending or descending?
a) DISTINCT b) ALL c) IN d) ORDER BY
146. Which DQL clause is used to filter the records?
a) WHERE b) ALL c) IN d) ORDER BY
147. DDL stands for:
a) Data Definition Language b) Data Declared Language
c) Defined Data Language d) Data Declared language
148. DML stands for:
a) Data Manipulation Language b) Data Memory Language
c) Data Main Language d) Data Machine Language
149. DCL stands for:
a) Data Control Language b) Dynamic Control Language
c) Dynamic Center Language d) Data Communication Language
150. TCL stands for:
a) Transmission Control Language b) Transfer Communication Language
c) Transaction Control Language d) Transmission Center Language
151. How many types of database integrity constraints are there?
a) 2 b) 3 c) 4 d) 5
152. Which of the following separated by multiple constraints?
a) Comma b) Semicolon c) Colon d) Space
153. Which of the following constraints does not allow NULL values?
a) Primary key b) Identifier c) Variables d) Unique
154. Which of the following keywords shows that the field value cannot be empty?
a) NOT NULL b) NO VALUE c) NULL d) O
155. Which of the following Constraint is used to a group of field of the table?
a) Constraint b) Unique c) Row d) Table
156. Which of the following keyword used to sort the records in ascending order?
a) ASC b) ASCE c) ACE d) ASCEN
157. Which of the following keyword used to sort the records in descending order?
a) DESEN b) DESC c) DESE d) DES
158. Which of the following begin with a keyword and consists of keyword and argument?
a) Clauses b) Statement c) Key d) Argument

ANSWER KEY

1. a) DDL
2. d) ALTER
3. a) DROP
4. a) SELECT
5. b) ORDER BY
6. c) SQL
7. a) SQL
8. d) Structural Query Language
9. a) SQL
10. a) SQL 2008
11. b) Dbase
12. d) a and c
13. c) Tables
14. a) Table
15. b) field
16. a) Data Definition Language
17. c) Data Manipulation language
18. b) DDL
19. d) DML
20. c) Authorization
21. a) Windows, Apache, MySQL, PHP
22. a) WAMP
23. c) 5
24. b) DDL
25. d) Data Control Language
26. d) Transfer Communication Language
27. c) Data Query Language
28. b) DDL
29. d) DDL
30. a) Grant
31. c) Truncate
32. b) Drop
33. c) iii only
33. c) iii only
34. d) Non- Procedural DML
35. c) Delete
36. a) DCL
37. a) GRANT
38. c) REVOKE
39. d) DCL
40. b) TCL
41. c) Commit
42. a) Revoke
43. a) Select
44. c) Save point
45. a) DQL
46. b) datatype
47. c) ANSI
48. d) double
49. a) 64
50. d) alters
51. a) Keywords
52. c) Keywords
53. b) Clauses
54. c) CREATE TABLE
55. d) all of these
56. c) Constraint
57. a) Constraint
58. c) Table
59. b) NOT NULL
60. d) 4
61. b) Table
62. a) Unique
63. b) Constraint
64. d) space
65. c) comma
66. a) Primary key
67. a) Primary key
68. c) NOT NULL
69. d) Check
70. b) Check
71. d) Table
72. b) Table
73. a) Insert
74. b) Null value
75. d) DELETE * FROM tablename
76. b) UPDATE
77. c) ADD
78. a) comma
79. d) SET
80. a) REMOVE
81. b) SELECT
82. c) SELECT
82. c) SELECT
83. d) DISTINCT
84. d) ALL
85. b) WHERE
86. c) IN
87. b) NOT IN
88. c) ASC
89. a) WHERE
90. c) WHERE
91. b) GROUP BY
92. d) GROUP BY
93. b) HAVING
94. c) SQL
95. d) DBMS
96. a) DBMS
97. d) Table
98. b) Record
99. c) DML
100. c) 2
101. a) DCL
102. d) datatype
103. a) one
104. b) Unique
105. c) Constraint
106. c) ALTER
107. d) QUERY
108. b) DISTINCT
109. a) BETWEEN
110. d) ISNULL
111. c) *
112. c) ROLLBACK TO
121. a) Tables
122. b) Integrity
123. c) RDBMS
124. a) Serve live website
125. d) Truncate
126. a) Delete
126. a) Delete
127. b) Commit
128. c) Rollback
129. d) Savepoint
130. c) 4
131. b) PRIMARY KEY
132. b) PRIMARY KEY
133. d) CHECK
134. b) TABLE
135. a) INSERT

136. b) SET 137. a) ALTER 138. a) DELETE 139. b) TRUNCATE 140. c) DROP 141. a) DISTINCT 142. b) ALL 143. c) BETWEEN 144. d) IN	145. d) ORDER BY 146. c) IN 147. a) Data Definition Language 148. a) Data Manipulation Language 149. a) Data Control Language 150. b) Transfer Communication Language	151. c) 4 152. d) Space 153. a) Primary key 154. a) NOT NULL 155. d) Table 156. a) ASC 157. b) DESC 158. a) Clauses

PART B

1. What is SQL?

- The Structured Query Language (SQL) is a standard programming language.
- Used to access and manipulate databases in Relational Data Base Management System (RDBMS).
- SQL allows the user to create, retrieve, alter, and transfer information among databases.

2. List few RDBMS packages.

Oracle, MySQL, MS SQL Server, IBM DB2 and MS Access

3. **What is RDBMS ?**

RDBMS is a type of DBMS with a row-based table structure that connects related data elements and includes functions related to Create, Read, Update and Delete operations, collectively known as CRUD.

4. **Expand**

(i) DDL - Data Definition Language
(ii) DML - Data Manipulation nLanguage
(iii) WAMP - Windows, Apache, MySQL, PHP**.**

5. Define Data Definition Language.

- The Data Definition Language (DDL) consist of SQL statements used to define the database structure or schema.
- It simply deals with descriptions of the database schema and is used to create and modify the structure of database objects in databases.
- The DDL provides a set of definitions to specify the storage structure and access methods used by the database system.

6. Define Data Manipulation Language.

- **A Data Manipulation Language (DML)** is a computer programming language used for adding (inserting), removing (deleting), and modifying (updating) data in a database.
- In SQL, the data manipulation language comprises the SQL-data change statements, which modify stored data but not the schema of the database table.
- After the database schema has been specified and the database has been created, the data can be manipulated using a set of procedures which are expressed by DML.

7. List the SQL DML commands.

Insert	Inserts data into a table
Update	Updates the existing data within a table.
Delete	Deletes all records from a table, but not the space occupied by them.

8. Define TCL.

Transactional control language (TCL) commands are used to manage transactions in the database. These are used to manage the changes made to the data in a table by DML statements.

9. Explain the following SQL TCL commands.

(i) Commit (ii) Roll back (iii) Save point

Commit	Saves any transaction into the database permanently.
Roll back	Restores the database to last commit state.
Save point	Temporarily save a transaction so that you can rollback.

10. Write the syntax of creating table in database.

The syntax of **CREATE TABLE** command is :

CREATE TABLE <table-name>
(<column name><data type>[<size>]
(<column name><data type>[<size>]……
);

11. How will assign a default value for the table field in a data base?

The **DEFAULT** constraint is used to assign a default value for the field. When no value is given for the specified field having **DEFAULT** constraint, automatically the default value will be assigned to the field.
Example showing **DEFAULT** Constraint in the student table:

CREATE TABLE Student
(
Admno integer NOT NULL PRIMARY KEY,
Name char(20)NOT NULL,
Gender char(1),
Age integer DEFAULT = "17", → Default Constraint
Place char(10),
);

12. How will you retain duplicate rows while displaying the table?

The **ALL** keyword retains duplicate rows. It will display every row of the table without considering duplicate entries.

SELECT ALL Place FROM Student;

13. Differentiate BETWEEN AND NOT BETWEEN keywords.

BETWEEN :
The BETWEEN keyword defines a range of values the record must fall into to make the condition true.
NOT BETWEEN :
The NOT BETWEEN is reverse of the BETWEEN operator where the records not satisfying the condition are displayed.

14. Differentiate IN and NOT IN keywords.

IN keyword :
The **IN** keyword is used to specify a list of values which must be matched with the record values. In other words it is used to compare a column with more than one value. It is similar to an **OR** condition.
NOT IN keyword :
The **NOT IN** keyword displays only those records that do not match in the list.

15. Write the syntax of ORDER by clause used in SELECT command.

The ORDER BY clause is used as :
SELECT <column-name>[,<column-name>,....] FROM <table-name>ORDER BY <column1>,<column2>,...ASC| DESC ;

16. Write the syntax of GROUP BY clause.

The syntax for the **GROUP BY** clause is
SELECT <column-names> FROM <table-name> GROUP BY <column-name>HAVING condition];

17. Write the syntax of HAVING clause.

SELECT Gender , count(*) FROM Student GROUP BY Gender HAVING Place = 'Chennai';

18. Expand

(i) SQL - Structured Query Language
(ii) DBMS - Database Management System
(iii) RDBMS - Relational Database Management System

19. How will you create database and work with the database? Give example.

(i) To create a database, type the following command in the prompt:

CREATE DATABASE database_name;

For example ; To create a database to store the tables:

CREATE DATABASE stud;

(ii) To work with the database, type the following command.

USE DATABASE;

For example ; To use the stud database created, give the command

USE stud;

20. What is the use of WAMP?

- WAMP stands for **"Windows, Apache, MySQL** and **PHP.**
- It is often used for web development and internal testing, but may also be used to serve live websites.

21. List the SQL DDL commands .Explain each.

Create	To create tables in the database.
Alter	Alters the structure of the database.
Drop	Delete tables from database.
Truncate	Remove all records from a table, also release the space occupied by those records.

22. What are two basic types of DML.

Procedural DML – Requires a user to specify what data is needed and how to get it.

Non-Procedural DML - Requires a user to specify what data is needed without specifying how to get it.

23. Write a note on data query language.

One of the most important tasks when working with SQL is to generate Queries and retrieve data. A Query is a command given to get a desired result from the database table. The **SELECT** command is used to query or retrieve data from a table in the database. It is used to retrieve a subset of records from one or more tables. The **SELECT** command can be used in various forms:

Syntax of SELECT command :

SELECT <column-list>FROM<table-name>;

The syntax for a table created with constraint is given as below:

CREATE TABLE <table-name>

(<column name><data type>[<size>]<column constraint>,
(<column name><data type>[<size>]<column constraint>……
<table constraint>(<column name>,[<column name>….])…..
);

24. Write the syntax of SELECT command for getting the desired result from the table.

The **WHERE** clause in the **SELECT** command specifies the criteria for getting the desired result. The general form of **SELECT** command with **WHERE** Clause is:

SELECT <column-name>[<column-name>,….] FROM <table-name>WHERE condition>;

25. How will search NULL values in a field? Give example.

The **NULL** value in a field can be searched in a table using the **IS NULL** in the **WHERE** clause. For example to list all the students whose Age contains no value, the command is used as:

SELECT * FROM Student WHERE Age IS NULL;

26. What is the use of ORDER BY clause?

- It is used to sort the data in either ascending or descending.
- Ascending order is default.
- DESC keyword used to sort in descending order
- ASC keyword used to sort in ascending order

27. What is the use of GROUP BY clause?

The GROUP BY clause is used with the SELECT statement to group the individual values or divide the table in to groups.

28. What is the use of HAVING clause?

The HAVING clause can be used along with GROUP BY clause in the SELECT statement to place condition on groups.

29. What is the use of COMMIT command?

The COMMIT command is used to permanently save any transaction to the database.

30. What is the use of ROLLBACK command?

The ROLLBACK command restores the database to the last committed state.

31. What is the use of SAVEPOINT command?

The ROLLBACK command **restore**s the database to the **last committed state**.

32. Write a query that selects all students whose age is less than 18 in order wise.

SELECT ALL Age FROM student WHERE Age < 18;

33. Differentiate Unique and Primary Key constraint.

Unique Key Constraint	**Primary Key Constraint**
(i) The constraint ensures that no two rows have the same value in the specified columns. **(ii)** The UNIQUE constraint can be applied only to fields that have also been declared as NOT NULL.	This constraint declares a field as a Primary Key which helps to uniquely identify a record. The Primary Key does not allow NULL values and therefore a field declared as Primary Key must have the NOT NULL constraint.

34. Write the difference between table constraint and column constraint?

Column constraint :

Column constraint can be applied only to individual column.

Table constraint :

Table constraint is applied to a group of fields of the table.

35. Which component of SQL lets insert values in tables and which lets to create a table?

Component of SQL :

(i) Insert values of tables DDL – Data Definition Language

(ii) Create a table DML – Data Manipulation Language

36. What is the difference between SQL and MySQL?

The main difference between SQL and MySQL is that the SQL is a database language to manage data in a relational database.

MySQL is an open source Relational Database Management System that helps to manage relational databases.

PART C

1. List the types of constraints.

- Unique Constraint
- Primary Key Constraint
- Default Constraint
- Check Constraint

2. Define Data Control Language and also list the command under this.

A Data Control Language (DCL) is used to control the access of data stored in a database for creating sequences, views of tables etc DCL commands:

Grant :Grants permission to one or more users to perform specific tasks

Revoke :Withdraws the access permission given by the GRANT statement

3. How will you frame the commands to work on database?

The SQL provides a predetermined set of commands to work on databases.

Keywords They have a special meaning in SQL. They are understood as instructions.

Commands They are instructions given by the user to the database also known as statements.

Clauses	They begin with a keyword and consist of keyword and argument.

4. How will you generate queries and retrieve data from the table? Explain?

One of the most important tasks when working with SQL is to generate Queries and retrieve data. A Query is a command given to get a desired result from the database table. The **SELECT** command is used to query or retrieve data from a table in the database. It is used to retrieve a subset of records from one or more tables. The **SELECT** command can be used in various forms:

Syntax of **SELECT** command :

SELECT <column-list>FROM<table-name>;

5. Write the different categories of SQL commands.

SQL commands are divided into five categories:

DML - Data Manipulation Language
DDL - Data Definition Language
DCL - Data Control Language
TCL - Transaction Control Language
DQL - Data Query Language

6. What is a constraint? Write short note on Primary key constraint.

Constraints are used to limit the type of data that can go into a table. This ensures the accuracy and reliability of the data in the database. Constraints could be either on a column level or a table level. Constraint is a condition applicable on a field or set of fields.

Primary Constraint :

(i) This constraint declares a field as a Primary key which helps to uniquely identify a record.

(ii) It is similar to unique constraint except that only one field of a table can be set as primary key.

(iii) The primary key does not allow **NULL** values and therefore a field declared as primary key must have the **NOT NULL** constraint.

7. Write a SQL statement to modify the student table structure by adding a new field.

ALTER TABLE <table-name> ADD <columnname>< data type><size>;

8. Write any three DDL commands.

(i) DELETE :

The DELETE command deletes only the rows from the table based on the condition given in the where clause or deletes all the rows from the table if no condition is specified. But it does not free the space containing the table.

(ii) TRUNCATE :

The TRUNCATE command is used to delete all the rows, the structure remains in the table and free the space containing the table.

(iii) DROP :

The **DROP** command is used to remove an object from the database. If you drop a table, all the rows in the table is deleted and the table structure is removed from the database. Once a table is dropped we cannot get it back.

9. Write the use of Savepoint command with an example.

(i) The **SAVEPOINT** command is used to temporarily save a transaction so that you can rollback to the point whenever required.

(ii) The different states of our table can be saved at anytime using different names and the rollback to that state can be done using the ROLLBACK command.

(iii) Example :

```
SAVEPOINT savepoint_name;
UPDATE Student SET Name = 'Mini'
WHERE Admno=105;
SAVEPOINT A;
INSERT INTO Student VALUES(106,
'Jisha', 'F', 19, 'Delhi');
SAVEPOINT B;
```

10. Write a SQL statement using DISTINCT keyword.

(i) The DISTINCT keyword is used along with the SELECT command to eliminate duplicate rows in the table. This helps to eliminate redundant data.

(ii) For Example: SELECT DISTINCT Place FROM Student;

11. How the data in RDBMs is stored? Explain.

- The data in RDBMS, is stored in database objects, called Tables. A table is a collection of related data entries and it consist of rows and columns.
- A field is a column in a table that is designed to maintain specific related information about every record in the table. It is a vertical entity that contains all information associated with a specific field in a table. The fields in a student table may be of the type AdmnNo, StudName, StudAge, StudClass, Place etc.
- A Record is a row, which is a collection of related fields or columns that exist in a table. A record is a horizontal entity in a table which represents the details of a particular student in a student table.

12. Write the function performed by DDL.

1. It should identify the type of data division such as data item, segment, record and database file.
2. It gives a unique name to each data item type, record type, file type and data base.
3. It should specify the proper data type.
4. It should define the size of the data item.
5. It may define the range of values that a data item may use.
6. It may specify privacy locks for preventing unauthorized data entry.

13. How will set a primary key for more than one field? Explain with example.

TABLE CONSTRAINT

When the constraint is applied to a group of fields of the table, it is known as Table constraint. The table constraint is normally given at the end of the table definition. Let us take a new table namely Student1 with the following fields Admno, Firstname, Lastname, Gender, Age, Place:

```
CREATE TABLE Student 1
(
Admno integer NOT NULL,
Firstname char(20),
Lastname char(20),
Gender char(1),
Age integer,
Place char(10),
PRIMARY KEY (Firstname, Lastname) → Table constraint
```

PART D

1. Write the different types of constraints and their functions.

Constraints ensure database integrity, therefore known as database integrity constraints. The different types of constraints are :

- Unique Constraint
- Primary Key Constraint
- Default Constraint
- Check Constraint

(i)Unique Constraint

This constraint ensures that no two rows have the same value in the specified columns. For example **UNIQUE** constraint applied on Admno of student table ensures that no two students have the same admission number and the constraint can be used as:

```
CREATE TABLE Student

(
Admno integer NOT NULL UNIQUE, → Unique constraint
Name char (20) NOT NULL,
```

```
Gender char (1),
Age integer,
Place char (10),
);
```

(ii) Primary Key Constraint

This constraint declares a field as a Primary key which helps to uniquely identify a record. It is similar to unique constraint except that only one field of a table can be set as primary key. The primary key does not allow **NULL** values and therefore a field declared as primary key must have the **NOT NULL** constraint.

Example showing Primary Key Constraint in the student table:

```
CREATE TABLE Student
(
Admno integer NOT NULL PRIMARY KEY, → Primary Key constraint
Name char(20)NOT NULL,
Gender char(1),
Age integer,
Place char(10),
);
```

(iii)The DEFAULT constraint

The **DEFAULT** constraint is used to assign a default value for the field. When no value is given for the specified field having **DEFAULT** constraint, automatically the default value will be assigned to the field.

```
CREATE TABLE Student
(
Admno integer NOT NULL PRIMARY KEY,
Name char(20)NOT NULL,
Gender char(1),
Age integer DEFAULT = "17", → Default Constraint
Place char(10),
);
```

(iv) Check Constraint

This constraint helps to set a limit value placed for a field. When we define a check constraint on a single column, it allows only the restricted values on that field. Example showing check constraint in the student table:

```
CREATE TABLE Student
(
Admno integer NOT NULL PRIMARY KEY
Name char(20)NOT NULL,
Gender char(1),
Age integer (CHECK<=19), → Check Constraint
Place char(10),
);
```

(v) TABLE CONSTRAINT

When the constraint is applied to a group of fields of the table, it is known as Table constraint. The table constraint is normally given at the end of the table definition. Let us take a new table namely Student1 with the following fields Admno, Firstname, Lastname, Gender Age, Place:

```
CREATE TABLE Student 1
```

```
(
Admno integer NOT NULL,
Firstname char(20),
Lastname char(20),
Gender char(1),
Age integer,
Place char(10),
PRIMARY KEY (Firstname, Lastname) → Table constraint
);
```

2. What are the components of SQL? Write the commands in each.

Components of SQL : SQL commands are divided into five categories:

- DDL - Data Definition Language
- DML - Data Manipulation Language
- DCL - Data Control Language
- TCL - Transaction Control Language
- DQL - Data Query Language

Data Definition Language :

(i) The Data Definition Language (DDL) consist of SQL statements used to define the database structure or schema.

(ii) It simply deals with descriptions of the database schema and is used to create and modify the structure of database objects in databases.

(iii) The DDL provides a set of definitions to specify the storage structure and access methods used by the database system.

(iv) SQL commands which comes under Data Definition Language are :

- **Create** To create tables in the database.
- **Alter** Alters the structure of the database.
- **Drop** Delete tables from database.
- **Truncate** Remove all records from a table, also release the space occupied by those records.

Data Manipulation Language :

(i) A Data Manipulation Language (DML) is a computer programming language used for adding (inserting), removing (deleting), and modifying (updating) data in a database.

(ii) In SQL, the data manipulation language comprises the SQL-data change statements, which modify stored data but not the schema of the database table.

(iii) After the database schema has been specified and the database has been created, the data can be manipulated using a set of procedures which are expressed by DML.

(iv) SQL commands which comes under Data Manipulation Language are :

- **Insert** Inserts data into a table
- **Update** Updates the existing data within a table.
- **Delete** Deletes all records from a table, but not the space occupied by them.

Data Control Language :

(i) A Data Control Language (DCL) is a programming language used to control the access of data stored in a database. It is used for controlling privileges in the database (Authorization).

(ii) The privileges are required for performing all the database operations such as creating sequences, views of tables etc.

(iii) SQL commands which come under Data Control Language are :

- **Grant** Grants permission to one or more users to perform specific tasks.
- **Revoke** Withdraws the access permission given by the GRANT statement.

Transactional Control Language :

(i) Transactional control language (TCL) commands are used to manage transactions in the database. These are used to manage the changes made to the data in a table by DML statements.
(ii) SQL command which come under Transfer Control Language are :

- **Commit** Saves any transaction into the database permanently.
- **Roll back -** Restores the database to last commit state.
- **Save point -** Temporarily save a transaction so that you can rollback.

Data query language :
(i) The Data Query Language consist of commands used to query or retrieve data from a database.
(ii) One such SQL command in Data Query Language is **Select** It displays the records from the table.

3. Write the processing skills of SQL.
The various processing skills of SQL are :

1. **Data Definition Language (DDL) :** The SQL DDL provides commands for defining relation schemas (structure), deleting relations, creating indexes and modifying relation schemas.
2. **Data Manipulation Language (DML)** : The SQL DML includes commands to insert, delete, and modify tuples in the database.
3. **Embedded Data Manipulation Language :** The embedded form of SQL is used in high level programming languages.
4. **View Definition :** The SQL also includes commands for defining views of tables.
5. **Authorization :** The SQL includes commands for access rights to relations and views of tables.
6. **Integrity :** The SQL provides forms for integrity checking using condition.
7. **Transaction control :** The SQL includes commands for file transactions and control over transaction processing.

4. Explain ALTER command in detail.
ALTER COMMAND :

The **ALTER** command is used to alter the table structure like adding a column, renaming the existing column, change the data type of any column or size of the column or delete the column from the table. It is used in the following way :
ALTER TABLE <table-name> ADD <column-name><data type><size>;
To add a new column "Address" of type 'char' to the Student table, the command is used as
ALTER TABLE Student ADD Address char;
To modify existing column of table, the **ALTER TABLE** command can be used with **MODIFY** clause like wise:
ALTER <table-name> MODIFY<column-name><data type><size>;
ALTER TABLE Student MODIFY Address char (25);

The above command will modify the address column of the Student table to now hold 25 characters.

The **ALTER** command can be used to rename an existing column in the following way :

ALTER <table-name> RENAME old-column-name TO new-column-name;
For example to rename the column Address to City, the command is used as :

ALTER TABLE Student RENAME Address TO City;

The **ALTER** command can also be used to remove a column or all columns, for example to remove a particular column, the **DROP COLUMN** is used with the **ALTER TABLE** to remove a particular field, the command can be used as:

ALTER <table-name> DROP COLUMN <column-name>;
To remove the column City from the Student table, the command is used as :
ALTER TABLE Student DROP COLUMN City;

5. Explain TCL commands in detail.
(i) COMMIT command

The **COMMIT** command is used to permanently save any transaction to the database. When any DML commands like **INSERT, UPDATE, DELETE** commands are used, the changes made by these commands are not permanent. It is marked permanent only after the **COMMIT** command is given from the SQL prompt. Once the **COMMIT** command is given, the changes made cannot be rolled back.

The **COMMIT** command is used as

COMMIT;

(ii) ROLLBACK command

The **ROLLBACK** command restores the database to the last commited state. It is used with **SAVEPOINT** command to jump to a particular savepoint location.
The syntax for the **ROLLBACK** command is :
ROLL BACK TO save point name;

(iii) SAVEPOINT command

The **SAVEPOINT** command is used to temporarily save a transaction so that you can rollback to the point whenever required. The different states of our table can be saved at anytime using different names and the rollback to that state can be done using the **ROLLBACK** command.

SAVEPOINT savepoint_name;

CHAPTER 13
PYTHON AND CSV FILES
PART A

1. A CSV file is also known as a
   a) Flat File b) 3D File c) String File d) Random File
2. The expansion of CRLF is
   a) Control Return and Line Feed b) Carriage Return and Form Feed
   c) Control Router and Line Feed d) Carriage Return and Line Feed
3. Which of the following module is provided by Python to do several operations on the CSV files?
   a) py b) xls c) csv d) os
4. Which of the following mode is used when dealing with non-text files like image or exe files?
   a) Text mode b) Binary mode c) xls mode d) csv mode
5. The command used to skip a row in a CSV file is
   a) next() b) skip() c) omit() d) bounce()
6. Which of the following is a string used to terminate lines produced by writer()method of csv module?
   a) Line Terminator b) Enter key c) Form feed d) Data Terminator
8. Which of the following creates an object which maps data to a dictionary?
   a) listreader() b) reader() c) tuplereader() d) DicReader ()
9. Making some changes in the data of the existing file or adding more data is called
   a) Editing b) Appending c) Modification d) Alteration
11. Which of the following gives the python programmer the ability to parse CSV files?
   a) CSV data b) CSV flat file c) CSV module d) CSV sheet
12. CSV means
   a) Condition separated values b) Comma separated values
   c) Colon separated values d) C++ solution values
13. Which of the following is a human readable text file where each line has fields?
   a) CSV text b) CSV sheet c) CSV module d) CSV file
14. Which of the following can protect if the data itself contains commas in CSV file?
   a) ' ' b) , , c) : d) " "
15. In CSV file, each record is to be located on a separate line, delimited by a line break by pressing
   a) Shift key b) Tab key c) Enter key d) ESV key

16. Fields containing line breaks denoted by
a) CSV b) XLS c) CLRF d) CRLF
17. In Excel, the default CSV files should open automatically by
a) Double click b) Single click c) Right click d) None of these
18. How many ways to read a CSV file?
a) 4 b) 3 c) 2 d) Only one
19. Which of the following is way to read a CSV file?
a) read() b) reader() c) dictreader() d) b and c
20. How many steps are there to do CSV file operations using python?
a) 3 b) 5 c) 4 d) 2
21. Which of the following built-in function Python has to open a file?
a) read() b) openfile() c) reader() d) open()
22. Python function open 0 returns a file object called
a) read b) write c) process d) handle
23. How many modes can be specified while opening a CSV file?
a) 4 b) 3 c) 2 d) None of these
24. Which of the following is not a mode used while opening a file?
a) w b) r c) a d) p
25. CSV file can be opened in
a) Text mode b) Binary mode
c) Application mode d) a or b
26. Which mode can be used when CSV files dealing with non-text files?
a) Read mode b) Write mode c) Process mode d) Binary mode
27. While reading CSV file in text mode, the data would be in the format
a) strings b) float c) numbers d) characters
28. Which file mode creates a new file if does not exist?
a) 'r' b) 'n' c) 'w' d) 'x'
29. Which python file mode open a file for exclusive creation?
a) 'a' b) 'x' c) 'w' d) 't'
30. Which python file modes are used to creating new file?
a) 'w' b) 'x' c) 'a' d) all of these
31. The statement f = open ("sample.txt") equivalent to the mode
a) r or r + b) r c) x d) x or a
32. The default file open mode is
a) x b) rt c) a d) r
33. The CSV file contents can be read with the help of the method
a) read() b) with open() c) reader() d) open()
34. Which of the following function is designed to take each line of the file and make a list of all columns?
a) reader() b) read() c) column() d) list()
35. Which of the following format(s) the CSV files data can be read?
a) Quotes b) Pipe c) Comma d) all of these
36. How many formats in which CSV file data can be read?
a) 4 b) 3 c) 5 d) 2
37. Which of the following is not a format in which CSV file data can be read?
a) Semi colon b) Quotes c) Pipe d) Comma
38. Which of the following describes the format of the CSV file that is to be read?
a) parameter b) dialect c) whitespace d) delimeter
39. Which of the following allows to create, store and re-use various formatting parameters for CSV file data?
a) class b) object c) dialect d) none of these
40. The function used to add elements to CSV file is
a) append() b) add() c) write() d) addition()
41. List literals are enclosed with
a) { } b) ( ) c) [ ] d) < >

42. In a CSV file, first row should be skipped while sorting, the function used is
a) readonly() b) next() c) readnext() d) nextrow
43. In CSV file, if more than one column can be sorted using
a) sorter() b) multisort() c) morecolumns() d) itemgetter()
44. CSV. reader() works with the following
a) list tuble b) set c) dictionary d) b or c
45. CSV dictreader() works with
a) list b) dictionary c) tuple d) set
46. Which of the following works with list/tupledict?
a) read() b) dictreader() c) reader() d) dict()
47. Which of the following works with dictionary?
a) reader() b) dictreader() c) read() d) dictionary()
48. How many ways are there to write a new or modify the existing CSV file?
a) 8 b) 4 c) 6 d) 2
49. Which method returns a writer object which converts the user's data into delimited strings on the given file-like object?
a) csv.write() b) csv.writer()
c) csv.write row() d) csv.write user()
50. Which method writes a row of data into the specified CSV file?
a) row() b) rowwrite() c) writerow() d) rowdata()
51. How many rows at a time the writerrow() method writes in a CSV file?
a) 2 b) 1 c) 4 d) many
52. Which of the following class of CSV file module is used to write CSV file with quotes by registering new dialects?
a) csv.register() b) csv.dialect()
c) csv.dialect_register() d) csv.register_dialect()
53. Which option allows to write the double quote or all the values in CSV file?
a) csv.QUOTE_ALL() b) csv.Quote() c) csv.ALL_QUOTE() d) csv.QUOTEALL()
54. The default value of dialect parameter skipinitialspace is
a) True b) off c) false d) on
55. The default line terminator is
a) \r b) \n c) \b d) a or b
56. Which of the following delimiter is considered as a column separator?
a) _ b) , c) | d) ;
57. Which method is used to write all the data at once?
a) allrow() b) writerow() c) write d) writer()
58. Which of the following function takes additional argument filed names that are used as dictionary keys fields?
(i) csv.DictReader() (ii) csv.Dicwriter() (iii) reader() (iv) writer ()
a) i and ii b) i and iii c) iii and iv d) only iii
59. Which function is used to print the data in dictionary format without order?
a) printdict() b) readdict() c) dict() d) dictionary()
60. By default CSV files should open automatically in
a) Excel b) OpenOffice c) Python d) Text Editor
61. Which method will free up the resources that were tied with the file?
a) free() b) close() c) open() d) resources()
62. Files saved in _____can be opened or edited by text editors.
a) Excel b) Python c) Worksheet d) CSV
63. _____ files are saved with extension.xlsx.
a) Notepad b) Excel c) CSV d) Wordpad
64. _____ file cannot store charts or graphs.
a) CSV b) MsWord c) Excel d) Openoffice calc
65. _____ the extension of CSV file is
a) .CV b) .CS c) .CSV d) .CVS
66. provides a module named CSV, using this several operations on the CSV file can be done.

a) Ms-Excel b) Openoffice calc c) Text editor d) Python

67. _____ files have been used extensively in e-commerce.
a) Ms-Excel b) Open - Open of file calc
c) CSV files d) Python

68. CSV file name _____ can be represented in the open command using
a) " " b) ' '
c) '' "" '' "" d) a or b

69. CSV files opened in binary mode returns _____
a) bits b) bytes c) Mbs d) GBs

70. The default mode in which CSV file are opened is _____
a) Binary mode b) Process mode c) Write mode d) Text mode

71. In _____ mode, CSV file data format is strings.
a) text mode b) read mode c) write mode d) process mode

72. _____ has a garbage collector to clean up unreferenced objects.
a) CSV b) Python c) Excel d) Open office

73. In dialects the parameter _____ is used for removing whitespaces after the delimiter.
a) skip space b) initial space
c) skip initial space d) skip

74. _____ command arranges a CSV file list value in ascending order.
a) sorting() b) listname.sort() c) listname.ascd() d) listname.asc()

75. _____ takes 1-dimensional data, and 2-dimensional to write in a file
a) write b) row() c) wrow() d) writerow()

76. A _____ is a string used to terminate lines produced by writer()
a) Line b) Custom Delimiters
c) Line Terminator d) Quotes

77. The _____ method sorts the elements of a given item in a specific order as same as sort().
a) sorter() b) sort reverse() c) reverse sort() d) sorting()

78. To read a CSV file into a dictionary can be done by using _____ class of CSV module.
a) dictionary() b) dictreader() c) readerdict() d) rdict()

79. Python's CSV module only accepts _____ as line terminator.
a) \r b) \n c) \a d) \r or \n

80. To sort by more than one column _____ with multiple indices is used.
a) sort b) more item() c) itemgetter() d) sorter()

81. What is extension filename of CSV?
a) .txt b) .csv c) .xls d) .PY

82. Each record is to be located on a separate line, delimited by a line break by pressing:
a) Enter key b) ctrl key c) Alt key d) Esc key

83. Which CSV file will be opened default?
a) Open office calc b) MS Excel
c) Star office calc d) Launch Excel

84. Which of the following is open the text mode?
a) 'r' b) 'x' c) 'a' d) 't'

85. Which is default file mode to open a file for reading?
a) `r' b) 'x' c) 'a' d) 't'

86. Which statement is best way to do ensures that the file is closed?
a) With b) Exit c) Stop d) Close

87. What is the shortcut key used to open a new CSV file in notepad?
a) ctrl + O b) ctrl + N c) Alt + O d) Alt + N

88. A dialect is a:
a) Class b) Object c) Method d) Function

89. Which delimiter is considered as column separator?
a) = (equal) b) , (comm a)
c) | (pipe) d) & (amphersan d)

90. Which operator is used to set more than one column in csv file?
a) Sort record b) item getter c) data getter d) column getter

91. Which class can be done to read csv file into a dictionary?
a) dict() b) Read c) DictReader d) Reader
92. Which method is used to writes all the data in to the new csv file?
a) write rows() b) write row() c) store rows() d) store row()
93. What is called to add more data in the existing csv file?
a) Append b) Adding c) Modification d) Writing
94. Which of the following known as default line terminator to write csv file?
a) '\r' b) '\n'
c) '\w' d) Both (a) and (b)
95. Which function is used to print the data in dictionary format without order?
a) DictReader() b) dict() c) function dict() d) Dictwriter()
96. Which is the default mode of csv file in reading and writing?
a) text mode b) binary mode c) formated mode d) pdf mode
97. Python has a garbage collector to clean up unreferenced:
a) variables b) objects c) method d) function
98. Which is used for removing white spaces after the delimiter in csv file?
a) "Skip initial space" b) "Skip"
c) "space" d) "initial space"
99. csv.reader and csv.writer work with:
a) list b) tuple c) a or b d) None
100. Adding a new row at the end of file is called:
a) Adding a row b) Appending a row c) Inserting a row d) Modifying a row
101. Which spreadsheet, by default the CSU file will be opened?
a) Open office calc b) Star calc c) MS Excel d) All of these
102. Wich of the mode for open a file for writing?
a) 'r' b) 'w' c) 'x' d) 'o'
103. Which of the mode for open a file for exclusive creation?
a) 'r' b) 'w' c) 'x' d) 'o'
104. Which of the mode to open for appending at the end of the file without truncating it?
a) 'a' b) 't' c) 'b' d) '+'
105. Which of the mode to open in binary mode?
a) 'a' b) 't' c) 'b' d) '+'
106. Which of the mode to open a file for updating?
a) 'a' b) 't' c) 'b' d) '+'
107. How many ways to read a CSV file?
a) 2 b) 3 c) 4 d) 5
108. How many types of modes can be used while opening a CSV file?
a) 2 b) 3 c) 4 d) 5
109. Which of the following is not type of mode while opening a CSV file?
a) w b) r c) a d) m
110. When reading CSV file in text mode, the format of data should be:
a) string b) integer c) character d) float
111. How many ways are available to write or modify the existing CSV file?
a) 2 b) 4 c) 6 d) 8
112. What is extension of CSV file?
a) .cs b) .csv c) .cv d) .c

ANSWER KEY

1. a) Flat File 2. d) Carriage Return and Line Feed 3. c) csv 4. b) Binary mode 5. a) next() 6. a) Line Terminator 8. d) DicReader () 9. c) Modification 11. c) CSV module 12. b) Comma separated values 13. d) CSV file 14. d) " " 15. c) Enter key 16. d) CRLF 17. a) Double click 18. c) 2 19. d) b and c 20. a) 3 21. d) open() 22. d) handle 23. b) 3 24. d) p 25. d) a or b 26. d) Binary mode 27. a) strings 28. c) 'w' 29. b) 'x' 30. d) all of these 31. a) r or r + 32. b) rt 33. c) reader() 34. a) reader() 35. d) all of these 36. b) 3 37. a) Semi colon 38. b) dialect 38. b) dialect 39. c) dialect 40. a) append() 41. c) [ ] 42. b) next()	43. d) itemgetter() 44. a) list tuble 45. b) dictionary 46. c) reader() 47. b) dictreader() 48. a) 8 49. b) csv.writer() 50. c) writerow() 51. b) 1 52. d) csv.register_dialect() 53. a) csv.QUOTE_ALL() 54. c) false 55. d) a or b 56. c) | 57. b) writerow() 58. a) i and ii 59. c) dict() 60. a) Excel 61. b) close() 62. d) CSV 63. b) Excel 64. a) CSV 65. c) .CSV 66. d) Python 67. c) CSV files 68. d) a or b 69. b) bytes 70. d) Text mode 71. a) text mode 72. b) Python 73. c) skip initial space 74. b) listname.sort() 75. d) writerow() 76. c) Line Terminator 77. a) sorter() 78. b) dictreader() 79. d) \r or \n 80. c) itemgetter() 81. b) .csv 82. a) Enter key 83. b) MS Excel	84. d) 't' 85. a) `r' 85. a) `r' 86. a) With 87. b) ctrl + N 88. a) Class 89. c) | (pipe) 90. b) item getter 91. c) DictReader 92. a) write rows() 93. c) Modification 94. d) Both (a) and (b) 95. b) dict() 96. a) text mode 97. b) objects 98. a) "Skip initial space" 99. c) a or b 100. b) Appending a row 101. c) MS Excel 102. c) 'x' 103. c) 'x' 104. a) 'a' 105. c) 'b' 106. d) '+' 107. a) 2 108. b) 3 109. d) m 110. a) string 111. d) 8 112. b) .csv

PART B

1. **What is CSV File?**
   A CSV file is a human readable text file where each line has a number of fields, separated by commas or some other delimiter.
2. **Mention the two ways to read a CSV file using Python.**
   (i) CSV files have been used extensively in e-commerce applications because they are considered very easy to process.
   (ii) There are two ways to read a CSV file.

(a) Use the csv module's reader function
(b) Use the DictReader class.

3. **Mention the default modes of the File.**
The default mode of csv file in reading and writing is text mode.

4. **What is use of next() function?**
next() function is used to skip the first row while sorting a CSV file or a selected column.

5. **How will you sort more than one column from a csv file? Give an example statement.**
To sort by more than one column you can use itemgetter with multiple indices.
operator .itemgetter (1,2).
Syntax :
sortedlist = sorted(data, key=operator.itemgetter(Col_number),reverse=True)

6. **Why CSV file is known as flat file?**
A CSV file is also known as a Flat File. Files in the CSV format can be imported to and exported from programs that store data in tables, such as **Microsoft Excel** or **OpenOfficeCalc**

7. **What is the use of CSV file?**
CSV is a simple **file format** used to store tabular data, such as a spreadsheet or database. Since they're plain text, they're easier to import into a spreadsheet or another storage database, regardless of the specific software.

8. **How will prefect the CSV File data contains common by itself?**
If the fields of data in your CSV file contain commas, you can protect them by enclosing those data fields in double-quotes (“). The commas that are part of your data will then be kept separate from the commas which delimit the fields themselves.

9. **Expand :**
(i) CSV – Comma Separated Values.
(ii) CRLF – Carriage Return line feed.

10. **How the CSV file operation takes place in python?**
Python, a file operation takes place in the following order
Step 1 : Open a file
Step : Perform Read or write operation
Step 3 : Close the file

11. **How the CSV filename represented in open command?**
File name or the complete path name can be represented either with in “ “ or in ‘ ‘ in the open command.

12. **Differentiate text mode and binary mode.**
Text mode :
- The default is reading in text mode.
- In this mode, while reading from the file the data would be in the format of strings.

Binary mode :
- binary mode returns bytes
- This is the mode to be used when dealing with non-text files like image or exe files.

13. **Why python has a garbage collector?**
Python has a garbage collector to clean up unreferenced objects but, one must not rely on it to close the file.

14. **What is the use of close() method?**
Closing a file will free up the resources that were tied with the file and is done using Python close() method.

15. **Write a note an reader().**
To read the contents of CSV file with the help of csv.reader() method. The reader function is designed to take each line of the file and make a list of all columns. Then, you just choose the column you want the variable data for. Using this method one can read data from csv files of different formats like quotes (" "), pipe (|) and comma (,).

16. **Write a note is register dialect() method?**
The whitespaces can be removed, by registering new dialects using csv.register_dialect() class of csv module. A dialect describes the format of the csv file that is to be read. In dialects the parameter “skipinitialspace**”** is used for removing whitespaces after the delimiter.

17. **What is dialect?**

A dialect is a class of csv module which helps to define parameters for reading and writing CSV. It allows you to create, store, and re-use various formatting parameters for your data.

18. What is use of sort() method?

sort() command arranges a list value in ascending order. list_name. sort(reverse) is used to arrange a list in descending order.

19. Differentiate sort() and sorted().

The sorted() method sorts the elements of a given item in a specific order – Ascending or Descending. Sort() method which performs the same way as sorted(). Only difference, sort() method doesn't return any value and changes the original list itself.

20. How will you read CSV file into a dictionary?

To read a CSV file into a dictionary can be done by using **DictReader** class of csv module which works similar to the reader() class but creates an object which maps data to a dictionary. The keys are given by the fieldnames as parameter.

21. How Dict Reader works or What is the use of dictionary key?

DictReader works by reading the first line of the CSV and using each comma separated value in this line as a **dictionary key.** The columns in each subsequent row then behave like dictionary values and can be accessed with the appropriate key

22. What is the use of dict()?

The function dict() is used to print the data in dictionary format without order.

23. What is an Ordered Dict?

DictReader() gives OrderedDict by default in its output. An OrderedDict is a dictionary subclass which saves the order in which its contents are added. To remove the OrderedDict use dict().

24. Differentiate writer() and writerow() method.

writer() :

The csv.writer() method returns a writer object which converts the user's data into delimited strings on the given file-like object.

writerow():

The writerow() method writes a row of data into the specified file.

25. What is called modification?

Making some changes in the data of the existing file or adding more data is called modification

PART C

1. Write a note on open() function of python. What is the difference between the two methods?

- Python has a built-in function open() to open a file.
- This function returns a file object, also called a handle, as it is used to read or modify the file accordingly

Example:

```
>>>f=open("sample.csv")
>>> with open(Htest.txtH,'r') as f:
```

2. Write a Python program to modify an existing file.

```
import csv
row = ['3', 'Meena','Bangalore']
with open('student.csv', 'r') as readFile:
reader = csv.reader(readFile)
lines = list(reader) # list()- to store each
row of data as a list
lines[3] = row
with open('student.csv', 'w') as writeFile:
writer = csv.writer(writeFile)
writer.writerows(lines)
readFile.close()
writeFile.close()
```

3. Write a Python program to read a CSV file with default delimiter comma (,).

```
import csv
csv.register_dialect('myDialect',delimiter =
```

```
',',quoting=csv.QUOTE_ALL,
skipinitialspace=True)
f=open('c:\\pyprg\\quotes.csv','r')
reader = csv.reader(f, dialect='myDialect')
for row in reader:
print(row)
```

4. What is the difference between the write mode and append mode.

The 'w' write mode creates a new file. If the file is already existing 'w' mode overwrites it. Where as 'a' append mode is used to add the data at the end of the file if the file already exists otherwise creates a new one.

5. What is the difference between reader() and DictReader() function?

The main difference between the csv.reader() and DictReader() is in simple terms csv.reader and csv.writer work with list/tuple, while csv. DictReader and csv.DictWriter work with dictionary.

6. How will you create CSV normal file?

To create a CSV file in Notepad, First open a new file using **File →New or ctrl +N.**

Then enter the data you want the file to contain, separating each value with a comma and each row with a new line.

For example consider the following details

Topic1,Topic2,Topic3
one,two,three
Example1,Example2,Example3

Save this content in a file with the extension .csv .

7. How will you save the CSV file in MS-Excel?

To create a CSV file using Microsoft Excel, launch Excel and then open the file you want to save in CSV format.

Once the data is entered in the worksheet, select **File → Save** As option, and for the "Save as type option", select CSV (Comma delimited) or type the file name along with extension .csv.

8. Write the syntax of reader().

The syntax for csv.reader() is

csv.reader(fileobject,delimiter,fmtparams)

9. Write a program to read a file with default delimiter comma.

```
import csv
with open('c:\\pyprg\\sample1.csv', 'r') as F:
reader = csv.reader(F)
print(row)
F.close()
```

10. What are the different ways of reading a CSV file using reader() method?

CSV file - data with default delimiter comma (,)
CSV file - data with Space at the beginning
CSV file - data with quotes
CSV file - data with custom Delimiters

11. What are the ways to write a new or edit are existing CSV file in python?

Creating A New Normal CSV File
Modifying An Existing File
Writing On A CSV File with Quotes
Writing On A CSV File with Custom Delimiters
Writing On A CSV File with Lineterminator
Writing On A CSV File with Quotechars
Writing CSV File Into A Dictionary

Getting Data At Runtime And Writing In a File

12. Write a program to create a new normal CSV file to store data.

```
Import csv
csvData = [['Student', 'Age'], ['Dhanush', '17'], ['Kalyani', '18'], ['Ram', '15']]
with open('c:\\pyprg\\ch13\\Pupil.csv', 'w') as CF:
writer = csv.writer(CF)
writer.writerows(csvData)
CF.close()
```

PART D

1. Differentiate Excel file and CSV file.

Excel	CSV
Excel is a binary file that holds information about all the worksheets in a file, including both content and formatting.	CSV format is a plain text format with a series of values separated by commas.
XLS files can only be read by applications that have been especially written to read their format, and can only be written in the same way.	CSV can be opened with any text editor in Windows like notepad, MS Excel, OpenOffice, etc.
Excel is a spreadsheet that saves files into its own proprietary format viz. xls or xlsx	CSV is a format for saving tabular information into a delimited text file with extension .csv
Excel consumes more memory while importing data	Importing CSV files can be much faster, and it also consumes less memory

2. Tabulate the different mode with its meaning.

Mode	Description
'r'	Open a file for reading. (default)
'w'	Open a file for writing. Creates a new file if it does not exist or truncates the file if it exists.
'x'	Open a file for exclusive creation. If the file already exists, the operation fails.
a'	Open for appending at the end of the file without truncating it. Creates a new file if it does not exist.
't'	Opren in text mode. (default)
'b'	Open in binary mode.
'+'	Open a file for updating (reading and writing)

3. Write the different methods to read a File in Python.

There are two ways to read a CSV file.

1. Use the csv module's reader function
2. Use the DictReader class.

csv module's reader function (csv.reader()) :

csv.reader() - to read CSV fileintolist/tuple.

It will take each line of the file and make a list of all columns.

By this method one can read data from csv files of different formats like quotes (" "), pipe (|) and comma (,).

syntax :

csv.reader(fileobject,delimiter,fmtparams)

file object :- contain path and mode of the file

delimiter :- an optional ,(,) is default .

fmtparams: optional ,It is used to override the default values of the dialects like skipinitialspace,quoting etc.

DictReader class (DictReader()):

- DictReader() - To read a CSV file into a dictionary It works similar to the reader() class .
- It creates an object which maps data to a dictionary.
- The keys are given by the fieldnames as parameter.

4. Write a Python program to write a CSV File with custom quotes.

```
import csv
info = [['SNO', 'Person', 'DOB'],
['1', 'Madhu', '18/12/2001'],
['2', 'Sowmya','19/2/1998'],
['3', 'Sangeetha','20/3/1999'],
['4', 'Eshwar', '21/4/2000'],
['5', 'Anand', '22/5/2001']]
csv.register_dialect('myDialect',quoting=csv.
QUOTE_ALL)
with open('c:\\pyprg\\ch13\\person.csv', 'w') as f:
writer = csv.writer(f, dialect='myDialect')
for row in info:
writer.writerow(row)
f.close()
```

5. Write the rules to be followed to format the data in a CSV file.

- Each record (row of data) is to be located on a separate line, Delimited by a line break by pressing enter key.
  The last record in the file may or may not have an ending line break
- The first line of the file is header.
- The header will contain names corresponding to the fields Header line is optional Within the header and each record, there may be one or more fields, separated by commas.
- Spaces are considered part of a field.
- The last field in the record must not be followed by a comma.
- Each field may or may not be enclosed in double quotes.
- Fields containing line breaks (CRLF), double quotes, and commas should be enclosed in double-quotes.
- If double-quotes are used to enclose fields, then a double-quote appearing inside a field must be preceded with another double quote.

6. Write a program to read the CSV file through python using reader() method.

```
import csv
csv.register_dialect('myDialect',delimiter = ',',skipinitialspace=True)
F=open('c:\\pyprg\\sample2.csv','r')
reader = csv.reader(F, dialect='myDialect')
for row in reader:
print(row)
F.close()
```

7. Write a program to read the CSV file which contains spaces after the delimiter.

```
import csv
csv.register_dialect('myDialect',delimiter = ',',skipinitialspace=True)
F=open('c:\\pyprg\\sample2.csv','r')
reader = csv.reader(F, dialect='myDialect')
for row in reader:
print(row)
```

```
F.close()
```

8. Write a program to read the CSV file with user defined delimiter.

```
import csv
csv.register_dialect('myDialect', delimiter = '|')
with open('c:\\pyprg\\sample4.csv', 'r') as f:
reader = csv.reader(f, dialect='myDialect')
for row in reader:
print(row)
f.close()
```

9. Write a program to read a specific column in a CSV file.

```
import csv
#opening the csv file which is in different location with read mode
f=open("c:\\pyprg\\ch13sample5.csv",'r')
#reading the File with the help of csv.reader()
readFile=csv.reader(f)
#printing the selected column
for col in readFile :
print col[0],col[3]
f.close()
```

10. Write a program to read the CSV file and store it in a list.

```
import csv
inFile= 'c:\\pyprg\\sample.csv'
F=open(inFile,'r')
reader = csv.reader(F)
arrayValue = []
for row in reader:
arrayValue.append(row)
print(row)
F.close()
```

11. Write a program to read the CSV file and store A column value in A list for sorting.

```
import csv
inFile= 'c:\\pyprg\\sample6.csv'
python file
F=open(inFile,'r')
reader = csv.reader(F)
next(reader)
arrayValue = []
a = int(input ("Enter the column number 1 to 3:-"))
for row in reader:
arrayValue.append(row[a])
arrayValue.sort()
for row in arrayValue:
print (row)
F.close()
```

12. How will you sort more than one column in a CSV file? Explain with an example.

```
import csv ,operator
data = csv.reader(open('c:\\PYPRG\\sample8.csv'))
next(data) #(to omit the header)
sortedlist = sorted (data, key=operator.itemgetter(1))
for row in sortedlist:
print(row)
```

13. Write a program to read CSV file with user Defined Delimiter into a Dictionary.

```
import csv
```

```
csv.register_dialect('myDialect',delimiter = '|',skipinitialspace=True)
filename = 'c:\\pyprg\\ch13\\sample8.csv'
with open(filename, 'r') as csvfile:
reader = csv.DictReader(csvfile, dialect='myDialect')
for row in reader:
print(dict(row))
csvfile.close()
```

14. Write a program to read CSV file with a line Terminator.

```
import csv
Data = [['Fruit', 'Quantity'], ['Apple', '5'], ['Banana', '7'], ['Mango', '8']]
csv.register_dialect('myDialect', delimiter = '|', lineterminator = '\n')
with open('c:\\pyprg\\ch13\\line.csv', 'w') as f:
writer = csv.writer(f, dialect='myDialect')
writer.writerows(Data)
f.close()
```

15. How will you write the CSV file with custom denote characters? Explain with an example.

```
import csv
csvData = [['SNO','Items'], ['1','Pen'], ['2','Book'], ['3','Pencil']]
csv.register_dialect('myDialect',delimiter = '|',quotechar = '"', quoting=csv.QUOTE_ALL)
with open('c:\\pyprg\\ch13\\quote.csv', 'w') as csvFile:
writer = csv.writer(csvFile, dialect='myDialect')
writer.writerows(csvData)
print("writing completed")
csvFile.close()
```

16. How will you write Dictionary into CSV file with custom dialects?.

```
import csv
csv.register_dialect('myDialect', delimiter = '|', quoting=csv.QUOTE_ALL)
with open('c:\\pyprg\\ch13\\grade.csv', 'w') as csvfile:
fieldnames = ['Name', 'Grade']
writer = csv.DictWriter(csvfile, fieldnames=fieldnames, dialect="myDialect")
writer.writeheader()
writer.writerows([{'Grade': 'B', 'Name': 'Anu'},
{'Grade': 'A', 'Name': 'Beena'},
{'Grade': 'C', 'Name': 'Tarun'}])
print("writing completed")
```

17. Write a program to set data at runtime and writing it in a CSV file.

```
import csv
with open('c:\\pyprg\\ch13\\dynamicfile.csv', 'w') as f:
w = csv.writer(f)
ans='y'
while (ans=='y'):
name = input("Name?: ")
date = input("Date of birth: ")
place = input("Place: ")
w.writerow([name, date, place])
ans=input("Do you want to enter more y/n?: ")
F=open('c:\\pyprg\\ch13\\dynamicfile.csv','r')
reader = csv.reader(F)
for row in reader:
print(row)
F.close()
```

CHAPTER 14
IMPORTING C++ PROGRAMS IN PYTHON
PART A

1. Which of the following is not a scripting language?
   a) JavaScript b) PHP c) Perl d) HTML
2. Importing C++ program in a Python program is called
   a) wrapping b) Downloading c) Interconnecting d) Parsing
3. The expansion of API is
   a) Application Programming Interpreter b) Application Programming Interface
   c) Application Performing Interface d) Application Programming Interlink
4. A framework for interfacing Python and C++ is
   a) C types b) SWIG c) Cython d) Boost
5. Which of the following is a software design technique to split your code into separate parts?
   a) Object oriented Programming b) Modular programming
   c) Low Level Programming d) Procedure oriented Programming
6. The module which allows you to interface with the Windows operating system is
   a) OS module b) sys module c) csv module d) getopt module
7. getopt() will return an empty array if there is no error in splitting strings to
   a) argv variable b) opt variable c) args variable d) ifile variable
8. Identify the function call statement in the following snippet.
if __name__ =='__main__':??
main(sys.argv[1:])
   a) main(sys.argv[1:]) b) __name__ c) __main__ d) argv
9. Which of the following can be used for processing text, numbers, images, and scientific data?
   a) HTML b) C c) C++ d) PYTHON
10. What does __name__ contains ?
   a) c++ filename b) main() name c) python filename d) os module name
11. Which of the following are general purpose programming language?
   a) Python b) C++ c) Java d) All of these
12. Which of the following is not general purpose language?
   a) Python b) C++ c) Perl d) Java
13. Which of the following is not a compiled statically typed language?
   a) C++ b) Python c) Java d) All of these
14. In which language datatype or not required while declare variable?
   a) Python b) C++ c) C d) Java
15. Which of the following can act both as scripting and general purpose language?
   a) Html b) Python c) C d) C++
16. Which programming language is useful when the logic can be written in C++ and manipulated through python program? a) C++ b) Html c) Perl d) Python
17. Which is a programming language designed for integrating and communicating with other programming languages? a) Procedural language b) Modular language
   c) Scripting language d) none of these
18. Which of the following is a scripting language?
   a) Ruby b) ASP c) TCl d) All of these
19. Which of the following language used automatic garbage collection?
   a) C++ b) Java c) Python d) C
20. A scripting language requires
   a) Interpreter b) Python c) Compiler d) Modules
21. A programming language requires
   a) Compiler b) Interpreter c) Modules d) Scripts
22. C++ code is 5 to 10 times more than
   a) Java b) Java script c) Python d) C
23. How many ways are there to create python interface?
   a) 4 b) 3 c) 5 d) Many

24. Which of the following interface used for interfacing with C programs?
a) Ctypes b) MicGW c) Boost d) Cython
25. SWIG expansion is
a) Software Wrapper Information Generator b) System Wrapper Interface Generator
c) Simplified Wrapper Interface Generator d) None of these
26. Which of the following python interface used for both C and C++?
a) MinGW b) Ctypes c) Cython d) SWIG
27. MinGW expansion is
a) Minimalist GNU for windows b) Minimalist Graphics for windows
c) Minimum GNU for windows d) Motion Graphics for windows
28. Which of the following is needed to run a C++ program on windows?
a) m++ b) f++ c) g++ d) ghre++
29. The command to change to the folder where Python is located is
a) Change b) CD c) Dir d) CDir
30. The syntax to execute the python program is
a) Python - i < filename.py > < c++ filename > b) Python < filename - py > < C++ filename > - i
c) Python < C++ filename > - i < filename.py > d) Python < filename.py > < C++ filename >
31. In the command python < filename.py > - i < C++ filename > where i denotes.
a) Information b) Interpreter c) Input mode d) ios
32. Which of the following is not a python module?
a) Tel b) OS c) Sys d) Getopt
33. The operator used to access the python functions using modules is
a) ; b) . c) :: d) ,
34. Which of the following is not a python module?
a) Sys b) OS c) Getopt d) g++
35. Which of the following is a python module?
a) Sys b) OS c) Getopt d) All of these
36. Which of the following is an array holding the command line arguments of the program?
a) g++ b) argv c) Opts d) Getopt
37. How many options getopt provides to enable command line argument parsing?
a) 2 b) 3 c) 4 d) 7
38. Getopt() method returns values are started in
a) Opts b) Args c) Sys d) a and b
39. Which of the following is a built - in variable which evaluates to the name of the current module?
a) - - main - - b) - - name - - c) - - getopt - - d) - - sys - -
40. The mode 'i'/'o' parses each values of the command line and pass as argument to the list called
a) Args b) Sys c) Opts d) Argv
41. Which of the following definition invoke the 'g++' compiler and creates the exe file?
a) Run b) Main c) Name d) System
42. _____ is typically interpreted language.
a) C++ b) Python c) Java d) None of these
43. _____ is mostly used as a 'glue' language.
a) CSV b) C++ c) Java d) Python
44. _____ is both a python like language for writing C extensions.
a) Boost b) Ctypes c) SWIG d) Cython
45. _____refers to a set of runtime header files used in compiling and linking the C++ code to be run or window OS?
a) MinGW b) SWIG c) Cython d) Boost
46. _____ version of MinGW is the best compiler for C++ on windows.
a) W32 b) W256 c) W64 d) W128
47. _____ allows to compile and execute C++ program dynamically through python program using g++.
a) SWIG b) MinGW c) Ctypes d) Boost
48. _____ is a program that calls GCC for linking the C++ library files to the object code.
a) C++ b) C c) Python d) g++
49. _____ refers to the complete path where python is installed.

a) Relative path b) Directory path c) Python path d) Absolute path

50. _____ is a software design technique to split the code into separate parts.
a) Procedural programming b) Modular Programming
c) Structural programming d) Object Oriented Programming

51. _____ refers to a file containing python statements and definitions?
a) Modules b) Procedures c) Structures d) Objects

52. _____ is the list of command-line argument passed to the python program?
a) OS.system() b) Getopt.getopt() c) Sys.argv d) Next()

53. To use sys.argv, you have to _____
a) Import CSV b) Import sys c) Import.+ py d) Include sys

54. _____ symbol is os.system() indicates that all strings are concatenated and send that as a list.
a) - b) () c) . d) +

55. ____ module of python helps you to split command line options and arguments.
a) OS b) Getopt c) Sys d) All of these

56. _____ method returns value consisting of two elements.
a) sys.argv b) getopt() c) OS.system() d) none of these

57. _____ is one such special variable which by default stores the name of the file.
a) - - name - - b) - - main - - c) - - getopt - - d) - - sys - -

58. _____ command of 'os' module executes the exe file to get the desired output.
a) Main() b) System() c) Name() d) Run()

59. The command to clear the window screen is_____
a) Clear b) Cls c) Clr d) Clrscr

60. The keyword used to import the module is _____
a) Include b) Import c) Input d) None of these

61. Choose the incorrect statement from the following.
(i) C++ program needs to be compiled before running.
(ii) Python need to be compile(d)
(iii) Perl, Ruby, ASP are the scripting languages.
(iv) Python is not high-level general purpose programming language.
a) ii and iv b) i and ii c) ii and iii d) i, ii and iv

62. Python is mostly used as_____language.
a) High level b) Scripting c) glue d) B or C

63. What is the name called, python deletes unwanted objects automatically to free the memory space?
a) Recycle b) Garbage collection
c) Interface d) Wrapping

64. Which mode is specify to input or output in python?
a) '-o' b) '-i' c) '-a' d) '-s'

65. Which method is used to returns values consisting of two values?
a) append() b) extend() c) getopt() d) insert()

66. Which interface is used for python-like language for writing c-extensions?
a) Cython b) Boost c) MinGW d) SWIG

75. Which language is used both as scripting and general purpose language?
a) C b) C++ c) Python d) HTML

76. Which programming language is designed for integrating and communicating with other programming language?
a) Modular language b) Procedural language c) Scripting language d) High level language

77. Which of the following is not a scripting language?
a) Ruby b) TCI c) ASP d) COBOL

78. Which requires a programming language?
a) Compiler b) Interpreter c) Editor d) Exefile

79. Which is requires a scripting language?
a) Compiler b) Interpreter c) Editor d) Exefile

80. Which of the following interface used for interfacing with C programs?
a) Cython b) Ctypes c) MinGw d) SWIG

81. Which of the following python interface used for both C and C++?

a) Cython b) Ctypes c) MinGw d) SWIG

82. Which is needed to run a C++ program on windows?
a) m++ b) g++ c) e++ d) f++

83. Which of the following is not a python module?
a) sys b) g++ c) os d) Getopt

84. Which version of MinGw is the best compiler for C++ on windows?
a) W32 b) W64 c) W128 d) W256

85. Which interface to a set of runtime headerfiles, used compiling and linking the code of C, C++?
a) SWIG b) MinGw c) Cython d) Ctypes

86. g++ is a___
a) module b) program c) scope d) identifier

87. Which command is used to clear the screen in window?
a) cls b) clear c) cs d) cl

88. Which operator is used to access the function?
a) (.)dot b) (:)colon c) (,)comma d) (;)semi colon

89. Which is mostly used as a 'glue' language?
a) C b) C++ c) Java d) Python

ANSWER KEY

1. d) HTML	31. c) Input mode	61. a) ii and iv
2. a) wrapping	32. a) Tel	62. d) B or C
3. b) Application Programming Interface	32. a) Tel	63. b) Garbage collection
4. d) Boost	33. b) .	64. a) '-o'
5. b) Modular programming	34. d) g++	65. c) getopt()
6. a) OS module	35. d) All of these	66. a) Cython
7. c) args variable	36. b) argv	75. a) C
8. c) __main__	37. a) 2	76. a) Modular language
9. a) HTML	38. d) a and b	77. d) COBOL
10. d) os module name	39. b) - - name - -	78. a) Compiler
11. d) All of these	40. c) Opts	79. b) Interpreter
12. c) Perl	41. a) Run	80. b) Ctypes
13. b) Python	42. b) Python	81. d) SWIG
14. a) Python	43. d) Python	82. b) g++
15. b) Python	44. d) Cython	83. b) g++
16. d) Python	45. a) MinGW	84. c) W128
17. b) Modular language	46. c) W64	85. b) MinGw
18. d) All of these	47. b) MinGW	86. b) program
19. c) Python	48. d) g++	87. a) cls
20. a) Interpreter	49. d) Absolute path	88. a) (.)dot
21. b) Interpreter	50. b) Modular Programming	89. d) Python
22. c) Python	51. a) Modules	
23. d) Many	52. c) Sys.argv	
24. a) Ctypes	53. b) Import sys	
25. c) Simplified Wrapper Interface Generator	54. d) +	
26. d) SWIG	55. b) Getopt	
27. a) Minimalist GNU for windows	56. b) getopt()	
28. c) g++	57. a) - - name - -	
29. b) CD	58. b) System()	
30. d) Python < filename.py > < C++ filename >	59. b) Cls	
	60. b) Import	

PART B

1. What is the theoretical difference between Scripting language and other programming language?

(i) The theoretical difference between the two is that scripting languages do not require the compilation step and are rather interpreted.

(ii) For example, normally, a C++ program needs to be compiled before running whereas, a scripting language like JavaScript or Python need not be compiled.

(iii) A scripting language requires an interpreter while a programming language requires a compiler. A given language can be called as a scripting or programming language depending on the environment they are put to use.

2. Differentiate compiler and interpreter.

Compiler	Interpreter
(i) Scans the entire program and translates it as a whole into machine code. **(ii)** It takes large amount of time to analyze the source code but the overall execution time is comparatively faster. **(iii)** Programming language like C, C++ use compilers.	Translates program one statement at a time. It takes less amount of time to analyze the source code but the overall execution time is slower. Programming language like Python, Ruby use interpreters.

3. Write the expansion of (i) SWIG (ii) MinGW

(i) SWIG – Simplified Wrapper Interface Generator

(ii) MINGW – Minimalist GNU for Windows

4. What is the use of modules?

(i) The use of modules to break down large programs into small manageable and organized files.

(ii) Modules provide reusability of code. Define our most used functions in a module and import it, instead of copying their definitions into different programs.

5. What is the use of cd command. Give an example.

'cd' command refers to change directory and absolute path refers to the couple path.

(Eg) "cd c:\program files\open office 4\program"

6. Differentiate static typed language and dynamic typed language.

static typed language:

A static typed language like C++ requires the programmer to explicitly tell the computer what "data type" each data value is going to use.

dynamic typed language:

A dynamic typed language like Python, doesn't require the data type to be given explicitly for the data. Python manipulate the variable based on the type of value.

7. List some scripting language.

The most widely used scripting languages are JavaScript, VBScript, PHP, Perl, Python, Ruby, ASP and Tcl.

8. What is garbage collection in python?

Python deletes unwanted objects (built-in types or class instances) automatically to free the memory space. The process by which Python periodically frees and reclaims blocks of memory that no longer are in use is called Garbage Collection.

9. What is the use of GNU C complier?

g++ is a program that calls GCC (GNU C Compiler) and automatically links the required C++ library files to the object code.

10. How will you execute C++ program through python using MinGW interface? Give example.

1. Double click the run terminal of MinGW

2. Go to the folder where the Python software is located (Python.exe) is located. In this example "Python folder" is located in

For example here "Python" is located in

C:\Program **Files\OpenOffiice 4\Python.**

11. What does cd command refers?

"cd" command refers to change directory and absolute path refers to the complete path where Python is installed.

12. Write a note on (i) CD command (ii) Cls command

(i) CD command

"cd" command refers to change directory and absolute path refers to the complete path where Python is installed.

(ii) Cls command

To clear the screen in command window use **cls** command.

13. What is meant by module?

Modular programming is a software design technique to split your code into separate parts. These parts are called modules. The focus for this separation should have modules with no or just few dependencies upon other modules.

14. Write a note on main (sys.argv [1]).

Accepts the program file (Python program) and the input file (C++ file) as a list(array). argv[0] contains the Python program which is need not to be passed because by default __main__ contains source code reference and **argv[1]** contains the name of the **C++ file** which is to be processed.

15. Write the syntax and example of (i) os.system() (ii) getopt()

(i) os.system()

os.system ('g++' + <varaiable_name1> '-<mode>' + <variable_name2>

(ii) getopt()

<opts>,<args>=getopt.getopt(argv, options, [long_options])

16. Write a command for wrapping C++ code.

```
if __name__=='__main__':
main(sys.argv[1:])
```

17. What is a script language?

A scripting language is a programming language designed for integrating and communicating with other programming languages. Some of the most widely used scripting languages are JavaScript, VBScript, PHP, Perl, Python, Ruby, ASP and Tcl.

18. What is the use `+' in os.system()?

'+' in os.system() indicates that all strings are concatenated as a single string and send that as a List.

PART C

1. Differentiate PYTHON and C++

PYTHON	C++
1 Python is typically an "interpreted" language	C++ is typically a "compiled" language
2 Python is a dynamic-typed language	C++ is compiled statically typed language
3 Data type is not required while declaring variable	Data type is required while declaring variable
4 It can act both as scripting and general purpose language	It is a general purpose language

2. What are the applications of scripting language?

- To automate certain tasks in a program
- Extracting information from a data set
- Less code intensive as compared to traditional programming language
- can bring new functions to applications and glue complex systems together

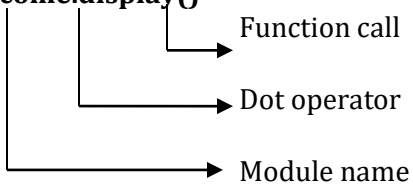
3. What is MinGW? What is its use?

- MinGW refers to a set of runtime header files, used in compiling and linking the code of C, C++ and FORTRAN to be run on Windows Operating System.
- MinGw-W64 (version of MinGW) is the best compiler for C++ on Windows. To compile and execute the C++ program. you need 'g++' for Windows. MinGW allows to compile and execute C++ program
- dynamically through Python program using g++.

- Python program that contains the C++ coding can be executed only through minGW-w64 project' run terminal. The run terminal open the command-line window through which Python program should be executed.

4. Identify the module ,operator, definition name for the following . welcome.display()

welcome.display()



5. What is sys.argv? What does it contain?

sys.argv is the list of command-line arguments passed to the Python program. **argv contains** all the items that come along via the command-line input, it's basically an array holding the command-line arguments of the program.

6. Write a note on:

(i) sys module (ii) OS module (iii) getopt module

(i) sys module provides access to some variables used by the interpreter and to functions that interact with the interpreter

(ii) OS module in Python provides a way of using operating system dependent functionality

(iii) The getopt module of Python helps you to parse (split) command-line options and arguments.

7. List the commonly used python interfaces.

- Python-C-API (API-**Application Programming Interface** for interfacing with C programs)
- Ctypes (for interfacing with c programs)
- SWIG (Simplified Wrapper Interface Generator- Both C and C++)
- Cython (Cython is both a Python-like language for writing C-extensions)
- Boost. Python (a framework for interfacing Python and C++)
- MinGW (Minimalist GNU for Windows)

8. How to import modules in python?

- We can import the definitions inside a module to another module. We use the import keyword to do this. To import our previously defined module factorial we type the following in the Python prompt.

>>> import factorial

- Using the module name we can access the functions defined inside the module.
- The dot (.) operator is used to access the functions. The syntax for accessing the functions from the module is

<module name> . <function name>

For example:

```
>>> factorial.fact(5)
120
```

PART D

1. Write any 5 features of Python.

(i) Python uses Automatic Garbage Collection whereas C++ does not.

(ii) C++ is a statically typed language, while Python is a dynamically typed language.

(iii) Python runs through an interpreter, while C++ is pre-compiled.

(iv) Python code tends to be 5 to 10 times shorter than that written in C++.

(v) In Python, there is no need to declare types explicitly where as it should be done in C++

(vi) In Python, a function may accept an argument of any type, and return multiple values without any kind of declaration beforehand. Whereas in C++ return statement can return only one value.

2. What is the purpose of sys, os, getopt module in Python.Explain

(i) Python's sys module sys.argv :

- It's basically an array.
- Holding the command-line arguments of the program.
- It contains all the items via the command-line input To use sys.argv, you will first have to import Sys.

- The first argument, sys.argv[0], is always the name of the program sys.argv[1] is the next argument you pass to the Program.

(ii) Python's OS Module os.system():

- The OS module allows you to interface with the Windows operating system where Python is running on.
- Syntax:
  os.system ('g++' + <varaiable_name1x '-<modex' + <variable_name2>
- Example:
  os.system('g++' + cpp_file + '-o' + exe_file)
- g++ compiler compiles the file cpp_file and -o (output) send to exe_file

(iii) Python getopt module:

- The getopt module of Python helps you to split command-line options and arguments. getopt() method returns value consisting of two elements.
- opts and args .
- Opts contains list of splitted strings like mode, path.
- args contains any string if at all not splitted .
  args will be an empty array if there is no error in splitting strings by getopt().
- Syntax:
  opts, args = getopt.getopt (argv, "i:",['ifile='])

CHAPTER 15
DATA MANIPULATION THROUGH SQL
PART A

1. Which of the following is an organized collection of data?
   a) Database b) DBMS c) Information d) Records
2. SQLite falls under which database system?
   a) Flat file database system b) Relational Database system
   c) Hierarchical database system d) Object oriented Database system
3. Which of the following is a control structure used to traverse and fetch the records of the database?
   a) Pointer b) Key c) Cursor d) Insertion point
4. Any changes made in the values of the record should be saved by the command
   a) Save b) Save As c) Commit d) Oblige
5. Which of the following executes the SQL command to perform some action?
   a) Execute() b) Key() c) Cursor() d) run()
6. Which of the following function retrieves the average of a selected column of rows in a table?
   a) Add() b) SUM() c) AVG() d) AVERAGE()
7. The function that returns the largest value of the selected column is
   a) MAX() b) LARGE() c) HIGH() d) MAXIMUM()
8. Which of the following is called the master table?
   a) sqlite_master b) sql_master c) main_master d) master_main
9. The most commonly used statement in SQL is
   a) cursor b) select c) execute d) commit
10. Which of the following clause avoide the duplicate?
    a) Distinct b) Remove c) Where d) GroupBy
11. Which of following is fast, flexible and easy to work?
    a) CSV b) Ruby c) SQlite d) Perl
12. Which method is SQlite is used create a connection with a database file created?
    a) cursor() b) lite() c) connection() d) connect()
13. Which method has a major role in working with python?

a) close b) execute() c) connect() d) cursor()

14. The SQlite command opens the already created database is
a) Cursor b) Connect c) Connection d) Sql-comm

15. Which of the following is a command to open the already created database from the statement connection = sqlite3.connect ("ABC.db")
a) ABC.db b) connection c) SQlite3 d) connect

16. Which SQlite keyword is used to fetch only the unique values from the database table?
a) UNIQUE b) HAVING c) DISTINCT d) GROUPBY

17. Which SQlite keyword is used to extract only those records that fulfill a specified condition?
a) WHERE b) EXTRACT c) CONNECT d) CURSOR

18. Which of the following clause is often used with aggregate functions to group the result?
a) ORDER BY b) WHERE c) GROUP BY d) DISTINCT

19. Which of the following is used define a SQL command in SQlite3?
a) " " " " " " b) " " c) ' ' d) " " " "

20. A table column will be automatically auto incremented in SQlite3 by giving
a) KEY b) KEY PRIMARY c) PRIMARY COLUMN d) PRIMARY KEY

21. The command to populate the table is
a) ADD b) APPEND c) INSERT d) ADDROW

22. Which of the following statement in SQL is used to retrieve or fetch data from a table in a database?
a) select b) inset c) create d) fetch

23. Which SQlite method is used to fetch the required number of rows in the database table?
a) fetch() b) tablerows() c) fetchamany() d) fetchrows()

24. Which of the following clause will not work in SQlite?
a) DISTINCT b) WHERE c) HAVING d) FETCHALL

25. Which sqlite method is used to fetch all rows from the database table?
a) fetch() b) fetchall() c) fetchrowsAll() d) fetchmany()

26. Which of the following is not an aggregate functions?
a) SUM b) POW c) COUNT d) MAX

27. The SQlite clause is used to sort the data in the table is
a) SORT b) ASC SORT c) ORDER BY d) GROUP BY

28. Which SQlite clause is used to filter data base on the group functions?
a) WHERE b) FILTER c) HAVING d) ORDER

29. In which class the group functions can be used?
a) WHERE b) GROUP BY c) DISTINCT d) HAVING

30. The WHERE clause cannot be combined with
a) XOR b) AND c) OR d) NOT

31. Which of the following operator cannot be used to filter records based on more than one condition?
a) AND b) OR c) XOR d) NOT

32. Which values cannot be counted?
a) Null b) Integer c) String d) Float

33. The command to modify the values in the existing table
a) MODIFY b) SELECT c) UPDATE d) CHANGE

34. How many kinds of placeholders the SQlite3 module supports
a) 5 b) 3 c) 2 d) 4

35. Which of the following placeholders does the SQlite3 module supports?
a) q mark style b) named style c) module style d) a and b

36. cursor.description will be stored as a
a) list b) tuple c) dictionary d) set

37. The table's field names can be displayed using
a) cursor.connect b) cursor.execute
c) cursor.description d) cursor.commit

38. _____ is a software application for the interaction between users and the databases.
a) DBMS b) CSV c) Python d) Sys

39. _____ program can interact as a user of a SQL database.

a) C++ b) C c) Python d) Java

40. _____ is a simple relational database system.
a) Cython b) SQlite c) Boost d) MySQL

41. _____ has a native library of SQlite.
a) Python b) C++ c) Java d) C

42. All the SQlite commands will be executed using _____object.
a) connect b) python c) CSV d) cursor

43. _____ method run the SQL command to perform some action.
a) run b) select c) execute d) execution

44. _____ function returns the number of rows in a table satisfying the criteria specified in the where class?
a) Distinct b) Count c) Having d) Counter

45. Count() returns _____if there were no matching rows.
a) 0 b) 1 c) NOT NULL d) NULL

46. _____ SQlite command contain the details of each table column headings
a) cursor.fieldname b) cursor.description
c) cursor.connect d) cursor.column

47. In python, the path of a file can be represented as _____
a) \\ or / b) \ or ? c) / or \\ d) // or ?

49. Python program can interact as a user of an:
a) SQL database b) MS Word c) Star. Writer d) None

50. Which statement in SQL is used to retrieve or fetch data from the table in a database?
a) INSERT b) FROM c) SELECT d) ORDERBY

51. Which method is returns the next row of a query result set?
a) fetchall() b) fetchone() c) fetchmany() d) Both A and B

52. Which method is displaying specified number of records is done?
a) fetchall() b) fetchone() c) fetchmany() d) Both A and B

53. Which clause is used to extract only those records that fulfill a specified condition in SQL?
a) WHERE b) DISTINCT c) HAVING d) GROUPBY

54. Which clause is used by groups records into summary rows in SQL?
a) WHERE b) DISTINCT c) HAVING d) GROUPBY

55. Which clause is used to sort the result set in ascending or descending order in SQL?
a) WHERE b) DISTINCT c) ORDERBY d) HAVING

56. Which clause is used to filter data based on the group function in SQL?
a) HAVING b) WHERE c) DISTINCT d) GROUPBY

57. Which clause can be combined with AND, OR, NOT operators in SQL?
a) HAVING b) WHERE c) DISTINCT d) GROUPBY

58. Which function returns 0 if there were no matching rows in SQL?
a) COUNT() b) SUM() c) MIN() d) MAX()

69. Which is SQLite is used create a connection with a database file created?
a) Cursor() b) connect() c) execute() d) lite()

70. The WHERE clause cannot be combined with:
a) XOR b) AND c) OR d) NOT

71. Which values cannot be counted?
a) Integer b) String c) Character d) NULL

72. Carsor.description will be stored as a.
a) list b) tuple c) set d) dictionary

73. The table's field names can be displayed using:
a) cursor.description b) cursor.connect
c) cursor.commit d) cursor.execute

74. _____is a simple relational database system.
a) python b) cython c) SQLite d) MySQL

75. What program can interact as a user of a SQL database?
a) C++ b) C c) java d) Python

76. Which method run the SQL command to perform some action?

a) cursor() b) execute() c) connect() d) lite()

77. Count()returns_____if there were nomatching tows.

a) NULL b) NOT NULL c) 0 d) 1

ANSWER KEY

1. a) Database 2. b) Relational Database system 3. c) Cursor 4. c) Commit 5. a) Execute() 6. c) AVG() 7. a) MAX() 8. b) sql_master 9. b) select 10. a) Distinct 11. c) SQlite 12. d) connect() 13. d) cursor() 14. b) Connect 15. d) connect 16. c) DISTINCT 17. a) WHERE 18. c) GROUP BY 19. a) " " " " " " 20. c) PRIMARY COLUMN 21. c) INSERT	22. a) select 23. c) fetchamany() 24. d) FETCHALL 25. b) fetchall() 26. b) POW 27. c) ORDER BY 28. c) HAVING 29. d) HAVING 30. a) XOR 31. d) NOT 32. a) Null 33. c) UPDATE 34. c) 2 35. a) q mark style 36. b) tuple 37. c) cursor.description 38. a) DBMS 39. c) Python 39. c) Python 40. b) SQlite 41. a) Python 42. d) cursor	43. c) execute 44. b) Count 45. a) 0 46. b) cursor.description 47. c) / or \\ 49. a) SQL database 50. c) SELECT 51. b) fetchone() 52. d) Both A and B 53. a) WHERE 54. d) GROUPBY 55. c) ORDERBY 56. a) HAVING 57. b) WHERE 58. a) COUNT() 69. b) connect() 70. a) XOR 71. d) NULL 72. b) tuple 73. a) cursor.description 74. c) SQLite 75. d) Python 76. b) execute() 77. c) 0

PART B

1. **Mention the users who uses the Database.**
   Users of database can be human users, other programs or applications
2. **Which method is used to connect a database? Give an example.**
   connect() - used to passing the name of the database
   ex. c=sqlite3.connect("D:\ela.db")
3. **What is the advantage of declaring a column as "INTEGER PRIMARY KEY"**
   If a column of a table is declared to be an INTEGER PRIMARY KEY, then whenever a NULL will be used as an input for this column, the NULL will be automatically converted into an integer which will one larger than the highest value so far used in that column.
4. **Write the command to populate record in a table. Give an example.**
   ```
   import sqlite3
   connection = sqlite3.connect ("Academy.db")
   cursor = connection.cursor()
   ```
5. **Which method is used to fetch all rows from the database table?**
   cursor.fetchall() -fetchall () method is to fetch all rows from the database table
6. **What is a cursor in SQL and databases?.**
   Cursor is a control structure used to traverse and fetch the records of the database. All the SQL commands will be executed using cursor object only.
7. **What is the reason behind defining a SQL command with triple quotes?**
   As data in a table might contain single or double quotes, SQL commands in Python are denoted as triple quoted string.
8. **What is master table?**
   sqlite_master is the master table which holds the key information about your database tables.

9. How will you sort the data in a table in an ordered way?

The ORDER BY Clause can be used along with the SELECT statement to sort the data of specific fields in an ordered way. It is used to sort the result-set in ascending or descending order.

10. What is the use of AND, OR operators combined with WHERE clause?

The WHERE clause can be combined with AND, OR, and NOT operators. The AND and OR operators are used to filter records based on more than one condition.

11. Write a note or cursor. description.

cursor. description contain the details of each column headings .It will be stored as a tuple and the first one that is 0(zero) index refers to the column name. Using this command you can display the table's Field names.

12. Write the placeholders which supported by SQlite3 module Execute.

Execute (sql[, parameters]) :- Executes a single SQL statement. The SQL statement may be parametrized (i. e. placeholders instead of SQL literals). The sqlite3 module supports two kinds of placeholders: question marks? ("qmark style") and named placeholders :name ("named style").

13. How the cursor object is created?

The cursor object is created by calling the cursor() method of connection. The cursor is used to traverse the records from the result set.

14. How the SQL DISTINCT class is helpful to you?

The distinct clause is helpful when there is need of avoiding the duplicate values present in any specific columns/table. When we use distinct keyword only the unique values are fetched.

15. What are clauses that can be used in the SELECT statements in SQL?

"Select" is the most commonly used statement in SQL. The SELECT Statement in SQL is used to retrieve or fetch data from a table in a database. The syntax for using this statement is **"Select * from table_name"** and all the table data can be fetched in an object in the form of list of lists.

PART C

1. What is SQLite? What is it advantage?

- SQLite is a simple relational database system, It saves data in files or in the internal memory of the computer.
- It is designed to be embedded in applications,.

Advantages:

SQLite is fast, rigorously tested, and flexible, making it easier to work

2. Mention the difference between fetchone() and fetchmany()

(i) cursor.fetchone() - The fetchone () method returns the next row of a query result set or None in case there is no row left.

(ii) cursor.fetchmany() method returns the next number of rows (n) of the result set.

3. What is the use of Where Clause.Give a python statement Using the where clause.

(i) The WHERE clause is used to extract only those records that fulfill a specified condition.

(ii) cursor.execute("SELECT DISTINCT (Grade) FROM student where gender='M'")

4. Read the following details.Based on that write a python script to display department wise records database name :- organization.db

Table name :- Employee

Columns in the table :- Eno, EmpName, Esal, Dept

```
import sqlite3
connection = sqlite3. connect ("organization.db")
cursor = connection . cursor ()
cursor. execute ("SELECT * FROM Employee
GROUPBY Dept")
result = cursor . fetchall ()
print (* result, sep = "\n")
```

5. Read the following details.Based on that write a python script to display records in desending order of Eno database name :- organization.db

Table name :- Employee

Columns in the table :- Eno, EmpName, Esal, Dept

```
import sqlite3
```

```
connection = sqlite3 . connect ("organization. db")
cursor = connection . cursor ()
cursor. execute ("SELECT * FROM Employee
ORDER BY Eno DESC")
result = cursor . fetchall ()
print (*result, sep = "\n")
```

6. Explain how the SELECT statement can be used along with GROUP BY class.

The SELECT statement can be used along with GROUP BY clause. The GROUP BY clause groups records into summary rows. It returns one records for each group. It is often used with aggregate functions (COUNT, MAX, MIN, SUM, AVG) to group the result-set by one or more columns. The following example count the number of male and female from the student table and display the result.

Example

```
import sqlite3
connection = sqlite3.connect("Academy.db")
cursor = connection.cursor()
cursor.execute("SELECT gender,count(gender) FROM student Group BY gender")
result = cursor.fetchall()
print(*result,sep="\n")
```

7. Write the sqlite steps to connect the database.

import sqlite3

create a connection using connect () method and pass the name of the database File

Set the cursor object cursor = connection. cursor ()

8. Explain how a connect to be made to a database (Academy through python SQlite3).

```
import sqlite3
connection = sqlite3.connect ("Academy.db")
cursor = connection.cursor()
```

9. What is the use of aggregate functions used along with SELECT statement?

COUNT() function returns the number of rows in a table.

- AVG() function retrieves the average of a selected column of rows in a table.
- SUM() function retrieves the sum of a selected column of rows in a table.
- MAX() function returns the largest value of the selected column.
- MIN() function returns the smallest value of the selected column

10. How will you creating a Database using SQLite?

```
import sqlite3
connection = sqlite3.connect ("Academy.db")
cursor = connection.cursor()
```

11. Write an example for creating a table in the SQL database. Table Name student.

```
sql_command = """
CREATE TABLE Student (
Rollno INTEGER PRIMARY KEY ,
Sname VARCHAR(20),
Grade CHAR(1),
gender CHAR(1),
Average DECIMAL(5,2),
birth_date DATE);"""
```

PART D

1. Write in brief about SQLite and the steps used to use it.

- SQLite is a simple relational database system, It saves data in files or in the internal memory of the computer.
- It is designed to be embedded in applications,.

Advantages:

SQLite is fast, rigorously tested, and flexible, making it easier to work

Steps to connect to database using sqlite3 in python

- Step 1: import sqlite3
- Step 2: create a connection using connect () method and pass the name of the database File
- Step 3: Set the cursor object
  cursor = connection. cursor ()

To create a table in the database, create an object and write the SQL command in it.

Example:- sql_comm = "SQL statement"

The following example is used to create database file,stu Table and enter and display data

```
import sqlite3
c=sqlite3.connect("D:\ela.db") cur=c.cursor()
cur.execute("create T  BLE stu(no integer not null primary key,name varchar(20);")
cur.execute("insert into
stu(no,name)values(101,'elango')) c.commit()
cur.execute("select * from stu;') a=cur.fetchall()
for x in cur:
print(x)
```

2. Write the Python script to display all the records of the following table using fetchmany()

Icode	ItemName	Rate
1003	Scanner	10500
1004	Speaker	3000
1005	Printer	8000
1008	Monitor	15000
1010	Mouse	700

```
import sqlite3
connection = sqlite3.connect ("shop.db")
cursor = connection . cursor ()
cusrsor . execute ("SELECT * FROM
electronics")
result = cursor . fetchall ()
print (* result, sep = "\n")
```

3. what is the use of HAVING clause. Give an example python script

Having clause is used to filter data based on the group functions. This is similar to WHERE condition but can be used only with group functions. Group functions cannot be used in WHERE Clause but can be used in HAVING clause.

Example

```
import sqlite3
connection = sqlite3.connect("Academy.db")
cursor = connection.cursor()
cursor.execute("SELECT GENDER,COUNT(GENDER) FROM Student GROUP BY GENDER HAVING
COUNT(GENDER)>3")
result = cursor.fetchall()
co = [i[0] for i in cursor.description]
print(co)
print(result)
```

4. Explain the different types of clauses in select statement.

(i) SQL DISTINCT CLAUSE

The distinct clause is helpful when there is need of avoiding the duplicate values present in any specific columns/table. When we use distinct keyword only the unique values are fetched.

Example:.

```
cursor.execute("SELECT DISTINCT (Grade) FROM student")
```

(ii) SQL WHERE CLAUSE

The WHERE clause is used to extract only those records that fulfill a specified condition.

Example:

```
cursor.execute("SELECT DISTINCT (Grade) FROM student where gender='M'")
```

(iii) SQL Group By Clause

The SELECT statement can be used along with GROUP BY clause. The GROUP BY clause groups records into summary rows. It returns one records for each group. It is often used with aggregate functions (COUNT, MAX, MIN, SUM, AVG) to group the result-set by one or more columns.

Example

```
cursor.execute("SELECT gender,count(gender) FROM student Group BY gender")
```

iv)SQL ORDER BY Clause

The ORDER BY Clause can be used along with the SELECT statement to sort the data of specific fields in an ordered way. It is used to sort the result-set in ascending or descending order.

Example:

```
cursor.execute("SELECT Rollno,sname FROM student Order BY sname")
```

(v) SQL HAVING Clause

Having clause is used to filter data based on the group functions. This is similar to WHERE condition but can be used only with group functions. Group functions cannot be used in WHERE Clause but can be used in HAVING clause.

Example:

```
cursor.execute("SELECT GENDER,COUNT(GENDER) FROM Student GROUP BY GENDER
HAVING COUNT(GENDER)>3")
```

5. Explain some Aggregate function in sqlite Sql statement.

Aggregate functions are used to do operations from the values of the column and a single value is returned

- COUNT()
- AVG()
- SUM()
- MAX()
- MIN()

COUNT() function

- It returns the number of rows in a table satisfying the condition specified in the WHERE clause.
- COUNT() returns 0 if there were no matching rows.

Example:

```
cursor.execute("SELECT COUNT(*) FROM student ")
```

AVG():

To display the average of data in a field.

Example:

```
cursor.execute("SELECT AVG(mark) FROM student ")
```

SUM():

To display the sum of data in a field.

Example:

```
cursor.execute("SELECT SUM(mark) FROM student ")
```

MAX() :

The MAX() function returns the largest value of the selected column.

Example:

```
cursor.execute("SELECT sname,max(AVERAGE) FROM student ")
```

MIN() :

The MIN() function returns the smallest value of the selected column

Example:

```
cursor.execute("SELECT sname,min(AVERAGE) FROM student ")
```

6 Explain AND, OR and NOT Operators in SQL.

The WHERE clause can be combined with AND, OR, and NOT operators. The AND and OR operators are used to filter records based on more than one condition.

Example for WHERE WITH NOT Operator :

To display the details of students who have scored other than 'A' or 'B' from the "student table"

Example

```
import sqlite3
connection = sqlite3.connect("Academy.db")
cursor = connection.cursor()
cursor.execute("SELECT * FROM student where grade<>'A' and Grade<>'B'")
result = cursor.fetchall()
print(*result,sep="\n")
```

OUTPUT

```
(3, 'BASKAR', 'C', 'M', 75.2, '1998-05-17')
(7, 'TARUN', 'D', 'M', 62.3, '1999-02-01')
```

Example for WHERE WITH AND Operator :

In this example we are going to display the name, Rollno and Average of students who have scored an average between 80 to 90% (both limits are inclusive)

Example

```
import sqlite3
connection = sqlite3.connect("Academy.db")
cursor = connection.cursor()
cursor.execute("SELECT Rollno,Same,Average FROM student WHERE (Average>=80 AND Average<=90)")
result = cursor.fetchall()
print(*result,sep="\n")
```

OUTPUT

```
(1, 'Akshay', 87.8)
(5, 'VARUN', 80.6)
```

Example for WHERE WITH OR Operator :

In this example we are going to display the name and Rollno of students who have not scored an average between 60 to 70%

Example

```
import sqlite3
connection = sqlite3.connect("Academy.db")
cursor = connection.cursor()
cursor.execute("SELECT Rollno,sname FROM student WHERE (Average<60 OR Average>70)")
result = cursor.fetchall()
print(*result,sep="\n")
```

OUTPUT

(1, 'Akshay')
(2, 'Aravind')
(3, 'BASKAR')
(4, 'SAJINI')
(5, 'VARUN')
(6, 'PRIYA')

CHAPTER 16
DATA VISUALIZATION USING PYPLOT:LINE CHART,PIE
PART A

1. Which is a python package used for 2D graphics?
   a) matplotlib.pyplot b) matplotlib.pip
   c) matplotlib.numpy d) matplotlib.plt
2. Identify the package manager for Python packages, or modules.
   a) Matplotlib b) PIP c) plt.show() d) python package
3. Read the following code: Identify the purpose of this code and choose the right option from the following.
C:\Users\YourName\AppData\Local\Programs\Python\Python36-32\Scripts>pip - version
   a) Check if PIP is Installed b) Install PIP c) Download a Package d) Check PIP version
4. Read the following code: Identify the purpose of this code and choose the right option from the following.
C:\Users\Your Name\AppData\Local\Programs\Python\Python36-32\Scripts>pip list
   a) List installed packages b) list command c) Install PIP d) packages installed
5. To install matplotlib, the following function will be typed in your command prompt. What does "-U"represents?
Python -m pip install -U pip
   a) downloading pip to the latest version b) upgrading pip to the latest version
   c) removing pip d) upgrading matplotlib to the latest version
8. Which key is used to run the module?
   a) F6 b) F4 c) F3 d) F5
9. Identify the right type of chart using the following hints.
Hint 1: This chart is often used to visualize a trend in data over intervals of time.
Hint 2: The line in this type of chart is often drawn chronologically.
   a) Line chart b) Bar chart c) Pie chart d) Scatter plot
10. Read the statements given below. Identify the right option from the following for pie chart.
Statement A: To make a pie chart with Matplotlib, we can use the plt.pie() function.
Statement B: The autopct parameter allows us to display the percentage value using the Python string formatting.
   a) Statement A is correct b) Statement B is correct
   c) Both the statements are correct d) Both the statements are wrong
11. Which kind of data encoded visually communicate a quantitative message?
   a) String b) Images c) Numbers d) None of these
12. The numerical data is encoded using
   a) dots b) lines c) bars d) all of these
13. Which of the following is not a type of Data Visualization?
   a) Graphs b) Infographics c) Picture d) Maps
14. Which of the following is the representation of information in a graphic format?
   a) Charts b) Dashboard c) Graphics d) Info graphics
15. Which of the following is a collection of resources assembled to create a single unified visual display?
   a) Info graphics b) Dashboard c) Graphics d) Chats
16. Which of the following translate complex ideas and concepts into a simple visual format?
(i) Data visualization (ii) Dashboards (iii) Tables (iv) Maps
   a) i, iii b) iii, ii c) i, ii d) i, iv
17. The most popular data visualization library in Python is

a) mat plot lib b) pip c) mat info lib d) mat pip lib

18. In Python mat plot lib is a
    a) control structure b) library
    c) list d) dictionary
19. Mat plot lib allows you to create a
    a) Table b) Info graphics c) Charts d) Maps
20. How many types of visualizations are there under mat plot lib?
    a) 6 b) 4 c) 5 d) Many
21. Which of following is not a visualization under mat plot lib?
    a) Scatter plot b) Box plot c) Histogram d) Table plot
22. Which of the following is a type of plot that shows the data as a collection of points?
    a) Box plot b) Scatter plot c) Chart plot d) Line plot
23. Which plot displays the distribution of data based on the five number summary?
    a) Scatter plot b) Line plot c) Box plot d) Chart plot
24. Which of the following is not a five number summary in box plot visualization?
    a) First Quartile b) Minimum c) Second Quartile d) Third Quartile
25. Which of the following is a management software for installing python package?
    a) mat plot lib b) pip c) plot d) plot lib
26. Which of the following command is used to install mat plot lib for coding?
    a) import plt.mat plot lib as plot b) import mat plot lib.pyplot as plt
    c) import plot.mat plot lib as plt d) import mat plot lib.plt as plot
27. Which of the following method will be add inside the file to display plot?
    a) plot() b) execute() c) show() d) display()
28. The default x.vector has the same length of y but starts with
    a) 0 b) 1 c) 2 d) 3
29. Which of the following command will take an arbitrary number of arguments?
    a) show() b) plot() c) legend() d) title()
30. Which button will help to navigate the chart?
    a) Navigate b) Zoom c) Pan d) Home
31. Which button used to click and drag a graph around?
    a) drag b) zoom c) pan d) home
32. Which button allows to configure various spacing options with figure?
    a) configure subplots b) configure plots
    c) subplots configure d) plots configure
33. The different kinds of plot created using
    a) Matliplot b) Plotlib c) Matplot d) Matplotlib
34. Which type of charts displays information as series of data points?
    a) Histogram b) Line c) Bar d) Pie
35. A line chart is type of chart which displays on formats as a data points called
    a) series b) lib c) markers d) plot
36. Which type of chart shows the relationship between a numerical variable and categorical variable?
    a) x-y plot b) pie c) line d) bar
37. Which refers to a graphical representation that displays data by way of bars to show the frequency of numerical data?
    a) Histogram b) Bar chart c) Barch graph d) Pie chart
38. Which of the following chart represents the frequency distribution of continuous variables?
    a) Bar b) Line c) Pie d) Histogram
39. Which of the following one indicates discontinuity?
    a) Histogram b) Pie c) Bar graph d) None of these
40. Which of the following plot we cannot rearrange the blocks from highest to lowest?
    a) Line b) Histogram c) Bar chart d) Pie chart
41. In which plot the width of the bars is always same?
    a) Line b) Histogram c) Bar chat d) Pie chart
42. In which plot the width of the bars may or may not be same?
    a) Line b) Bar chat c) Histogram d) Pie chat

43. Which plot is a circular graphical representation of numerical data?
a) Pie chart b) Histogram c) xy plot d) Bar plot
44. Which parameter used to display() the percentage value using Python string formatting in pie chart?
a) percent b) percentage c) pct d) autopct
45. Data visualization used _____ graphics.
a) 2D b) Statistical c) 3D d) Image
46. _____ is the graphical representation of information and data.
a) Data Images b) Data Dimension
c) Data visualization d) Data Graphics
47. _____ in data visualization helps to show relationship in the data for more variables.
a) Charts b) Tables c) Graphics d) Dashboards
48. In Scatter plot, the position of a point depends on its _____ value.
a) 7 - Dimensional b) 1- Dimensional c) 3 - Dimensional d) 2 - Dimensional
49. If a list given to the plot() command, mat plot lib assumes it is a sequence of _____ values.
a) x b) y c) 4 d) 0
50. Zoom in will require _____ and drag.
a) click b) right click c) left click d) double click
51. Zoom out will require _____ and drag.
a) click b) left click c) double click d) right click
52. _____ and _____ are the two ways to display data in the form of diagram.
a) Bar Graph, Histogram b) Line chart, Pie chart
c) Line chart, Bar chart d) Line chart, Histogram
53. Which is the representation of information in a graphic format?
a) Infographic b) Dashboard c) Matplotlib d) Visual format
54. Which is a collection of resources assembled to create a single unified visual display?
a) Infographic b) Dashboard c) Matplotlib d) Visual format
55. Which is the most popular data visualization library in python?
a) Infographic b) Dashboard c) Matplotlib d) Visual format
56. Which is a type of plot that shows the data as a collection of points?
a) Scatter plot b) Box plot c) Line plot d) Bar plot
57. Which is a standardized way of displaying the distribution of data based plot?
a) Scatter plot b) Box plot c) Line plot d) Bar plot
58. Which method is used inside the file to display your plot?
a) plt.show b) plt.legend c) plt.plot d) plt.title
59. Which button allows you to click it and then click and drag your graph around?
a) Home b) Pan Axis c) Zoom d) Back
60. Which chart displays information as a series of data points?
a) Line b) Pie c) Histogram d) Bar
61. Which plot is one of the common type?
a) Line b) Pie c) Histogram d) Bar
62. Which plot is probably one of the most common type?
a) Line b) Pie c) Histogram d) Bar
71. Matplotlib is a:
a) Function name b) Reserved word c) Library d) Key word
72. Matplotlib allows to create a:
a) graphics b) maps c) picture d) charts
73. How many types of visualizations under matplotlib?
a) five b) six c) seven d) many
74. Which is a type of plot that shows the data as a collection of points?
a) Line plot b) Box plot c) Scatter plot d) Pie plot
75. Which plot is the distribution of data based on the five number summary?
a) Line plot b) Box Plot c) Scatter plot d) pie plot
76. Which command is used to import matplotlib for coding?
a) import matplotlib.pyplot as plt b) import matplotlib.pypt as pt

c) import matplotlb.pyplt as Plt d) import mathplotlb.pyplot as pt

77. Which method will be add inside the file to display plot?
a) display() b) show() c) print() d) write()
78. The default x.vector has the same length of y but starts with.
a) 0 b) 1 c) 2 d) 3
79. Which button is used to navigate the chart?
a) ctrl b) ALT c) Home d) End
80. Which button is used to click and drag a graph around?
a) Drag b) Home c) pan d) ALT
81. Which type of chart shows the relationship between a numerical and categorical variable?
a) Line b) Bar c) Pie d) Histogram
82. Which type of chart to show the frequency of numerical data?
a) Line b) Bar c) Pie d) Histogram
83. Which type of chart to indicates discontinuity?
a) Line b) Bar c) Pie d) Histogram
84. Which type of chart, the width of the bar is always same?
a) Line b) Bar c) Pie d) Histogram
85. Which type of chart is a circular graphical representation of numeric data?
a) line b) pie c) bar d) Histogram

ANSWER KEY

1. a) matplotlib.pyplot	29. b) plot()	58. a) plt.show
2. b) PIP	30. d) Home	59. b) Pan Axis
3. a) Check if PIP is Installed	31. c) pan	60. a) Line
4. a) List installed packages	32. a) configure subplots	61. d) Bar
5. b) upgrading pip to the latest version	33. d) Matplotlib	62. b) Pie
8. d) F5	34. b) Line	71. c) Library
9. a) Line chart	35. c) markers	72. d) charts
10. c) Both thestatements are correct	36. d) bar	73. d) many
11. c) Numbers	37. a) Histogram	74. c) Scatter plot
12. d) all of these	38. d) Histogram	75. b) Box Plot
13. c) Picture	39. c) Bar graph	76. a) import matplotlib.pyplot as plt
14. d) Info graphics	40. b) Histogram	77. b) show()
15. b) Dashboard	41. c) Bar chat	78. a) 0
16. c) i, ii	42. c) Histogram	79. c) Home
17. a) mat plot lib	43. a) Pie chart	80. c) pan
18. b) library	44. d) autopct	81. d) Histogram
19. c) Charts	45. b) Statistical	82. d) Histogram
20. d) Many	46. c) Data visualization	83. b) Bar
21. d) Table plot	47. a) Charts	84. b) Bar
22. b) Scatter plot	48. d) 2 - Dimensional	85. b) pie
22. b) Scatter plot	49. b) y	
23. c) Box plot	50. c) left click	
24. c) Second Quartile	51. d) right click	
25. a) mat plot lib	52. a) Bar Graph, Histogram	
26. b) import mat plot lib.pyplot as plt	53. a) Infographic	
27. c) show()	54. b) Dashboard	
28. a) 0	55. c) Matplotlib	
	56. a) Scatter plot	
	57. b) Box plot	

PART B

1. Define: Data Visualization.

Data Visualization is the graphical representation of information and data. Th e objective of Data Visualization is to communicate information visually to users. For this, data visualization uses statistical graphics. Numerical data may be encoded using dots, lines, or bars, to visually communicate a quantitative message.

2. List the general types of data visualization.

General types of Data Visualization

- Charts
- Tables
- Graphs
- Maps
- Infographics
- Dashboards

3. List the types of Visualizations in Matplotlib.+

- Line plot
- Scatter plot
- Histogram
- Box plot
- Bar chart and
- Pie chart

4. How will you install Matplotlib?

- We can install matplotlib using pip.
- Pip is a management software for installing python packages.

To install matplotlib,

- Type the following in your command prompt:
- python -m pip install -U matplotlib
- This command will download matplotlib from the source library

5. Write the difference between the following functions: plt.plot([1,2,3,4]), plt. plot([1,2,3,4], [1,4,9,16]).

plt.plot([1,2,3,4]) :

- When we provide a single list to the plot ()
- matplotlib takes it as y values,
- x values are automatically generates
- default x vector has the same length as y
- but starts with 0.
- x-axis ranges from 0-3 and the y-axis from 1-4
- plots using the point (0,1),(1,2),(2,3),(3,4)

plt. plot([1,2,3,4], [1,4,9,16]):

- Here we provide two value to the plot () , so matplotlib assume
- x-axis ranges [1,2,3,4] and y-axis ranges [1,4,9,16]
- plots using the point (1,1), (2,4), (3,9) and (4,16)

6. Write a note on mat plot lib or which python library is used to create data visualization?

Matplotlib is the most popular data visualization library in Python. It allows you to create charts in few lines of code.

7. Which plot shows the data as a collection of points? Explain or write a note on scatter plot.

A scatter plot is a type of plot that shows the data as a collection of points. The position of a point depends on its two-dimensional value, where each value is a position on either the horizontal or vertical dimension.

8. Write note or Box plot.

The box plot is a standardized way of displaying the distribution of data based on the five number summary: minimum, first quartile, median, third quartile, and maximum

9. What is pip?

matplotlib installed using pip. Pip is a management software for installing python packages.

10. What are the two ways to display data in the form of diagram?

Bar Graph and Histogram are the two ways to display data in the form of a diagram.

11. What is Infographics?

An infographic (information graphic) is the representation of information in a graphic format.

12. What is Dashboard?

A dashboard is a collection of resources assembled to create a single unified visual display. Data visualizations and dashboards translate complex ideas and concepts into a simple visual format. Patterns and relationships that are undetectable in text are detectable at a glance using dashboard.

13. What is called markers?

A Line Chart or Line Graph is a type of chart which displays information as a series of data points called 'markers'

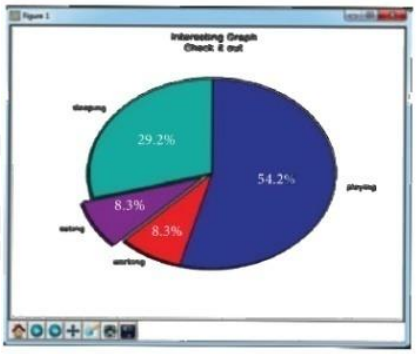
14. What is the use of pan Axis?

This cross-looking button allows you to click it, and then click and drag your graph around.

PART C

1. Draw the output for the following data visualization plot.

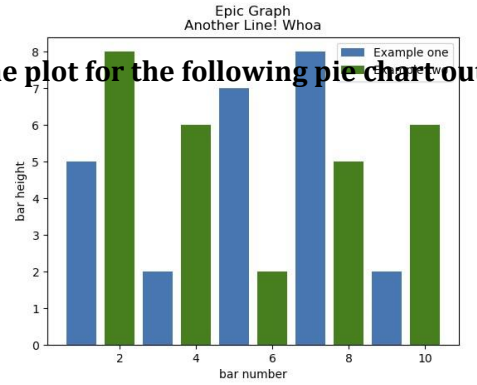
```
import matplotlib.pyplot as plt
plt.bar([1,3,5,7,9],[5,2,7,8,2], label="Example one")
plt.bar([2,4,6,8,10],[8,6,2,5,6], label="Example two", color='g')
plt.legend()
plt.xlabel('bar number')
plt.ylabel('bar height')
plt.title('Epic Graph\nAnother Line! Whoa')
plt.show()
```



2. Write any three uses of data visualization.

- Data Visualization help users to analyze and interpret the data easily.
- It makes complex data understandable and usable.
- Various Charts in Data Visualization helps to show relationship in the data for one or more variables.

3. Write the plot for the following pie chart output.



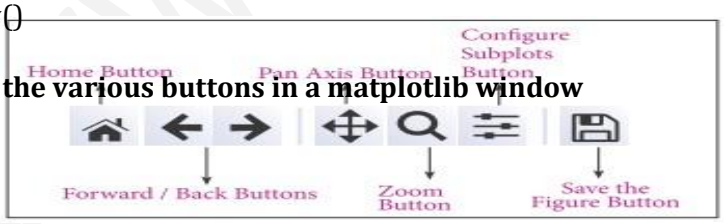

```
import matplotlib.pyplot as plt s=[29.2,8.3,8.3,54.2]
l=['Sleeping','Eating','Working','Playing']
plt.pie(s,explode=(0,0.1,0,0),labels=l,autopct=
('%1.1f%%'),   shadow=True,startangle=90)
plt.title('Interisting Graph\n Check it Out')
plt.show()
```

PART D

1. Write a python program to plot two lines

```
import matplotlib.pyplot as plt
 x = [1,2,3]
 y = [5,7,4]
 x2 = [1,2,3]
 y2 = [10,14,12]
 plt.plot(x, y, label='Line 1') plt.plot(x2, y2, label='Line 2') plt.xlabel('X-
 Axis')
 plt.ylabel('Y-Axis')
 plt.title('LINE GRAPH') plt.legend()
plt.show()
```

2. Explain the various buttons in a matplotlib window



Home Button :

- It helps to begun navigating your chart.
- To return back to the original view Forward/Back buttons :
- Used to move back and previous Pan Axis:
- Used to click and drag your graph move around. Zoom:

- To zoom into specifically.
  Zooming in - a left click and drag.
  Zoom out - a right click and drag. Configure Subplots:
- This button allows you to configure various spacing options with your figure and plot.
- Save Figure:
  To save your figure in various forms.

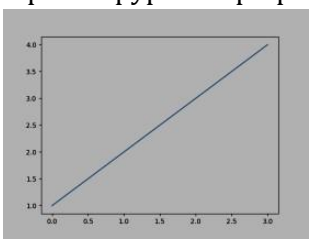
3. Explain in detail the types of pyplots using Matplotlib.

Line Chart :

- A Line Chart or Line Graph displays information as a series of data points called 'markers' connected by straight line segments.
- Used to visualize a data over intervals of time - a time series - thus the line is often drawn chronologically.

Example :

```
import matplotlib.pyplot as plt plt.plot([1,2,3,4])
plt.show()
```

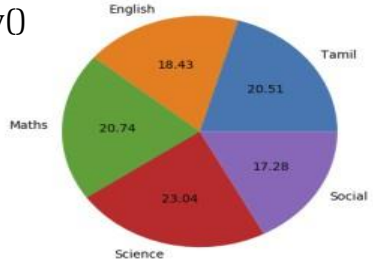


Bar Chart :

- It shows the relationship between a numerical variable and a categorical variable.
- Bar chart represents data with rectangular bars.
- Each bar has a height corresponds to the value it represents.
- The bars can be plotted vertically or horizontally.
- Used to compare a given numeric value on different categories.
- plt.bar() function used to make a bar chart

Example:

```
import matplotlib.pyplot as plt
plt.bar([1,3,5,7,9],[5,2,7,8,2], label="Example
one")
plt.legend()
plt.xlabel('number')
plt.ylabel('height')
plt.title('Bar Graph')
plt.show()
```

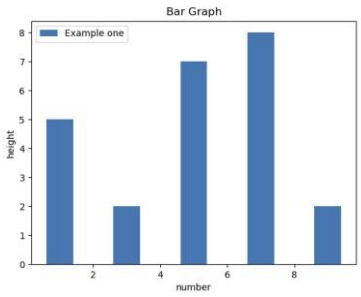


Pie Chart :

- Pie Chart is probably one of the most common type of chart.
- It is a circular graphic which is divided into slices to illustrate numerical proportion.
- The point of a pie chart is to show the relationship of parts out of a whole.
- To make a Pie Chart with Matplotlib, we can use the **plt.pie()** function.
- The autopct parameter allows us to display the percentage value using the Python string formatting.

Example

```
import matplotlib.pyplot as plt
sizes = [89, 80, 90, 100, 75]
labels = ["Tamil", "English", "Maths", "Science", "Social"]
plt.pie (sizes, labels = labels, autopct = "%.2f ")
                                        plt.axes().set_aspect ("equal")
                                        plt.show()
```



4. Create a plot. Set the title, the x and y labels for both axes.

```
import matplotlib.pyplot as plt x=[1,2,3]
y=[5,7,4]
plt.plot(x,y)
plt.xlable('X- XIS')
plt.ylabel('Y- XIS')
plt.title('LINE GR  PH)
plt.show()
```

5. Plot a pie chart for your marks in the recent examination.

```
import matplotlib.pyplot as plt s=[60,85,90,83,95]
l=['L  NG','ENG','M  T','SCI','SS'] plt.pie(s,labels=l)
plt.title('MARKS') plt.show()
```

6. Plot a line chart on the academic performance of Class 12 students in Computer Science for the past 10 years.

```
import matplotlib.pyplot as plt
x=[2009,2010,2011,2012,2013,2014,2015,2016, 2017,2018]
y=[56,68,97,88,92,96,98,99,100,100] plt.plot(x,y)
plt.xlable('YE  R')
plt.ylabel('P  SS % IN C.S') plt.show()
```

7. Plot a bar chart for the number of computer science periods in a week.

```
import matplotlib.pyplot as plt
x=[“MON”,”TUE”,”WED”,”THUR”,”FRI”] y=[6,5,2,1,7]
plt.bar(x,y)
plt.xlable(‘DAYS’) plt.ylabel(‘PERIOD’) plt.show()
```

8. Write a program to get five marks using list and display the marks in pie chart

```
import matplotlib.pyplot as plt
s = ["Tamil", "English", "Maths", "Science", "Social"]
m=[]
i=1
while i<=5:
  m.append(int(input("Enter Mark = ")))
  i+=1
plt.pie (m,labels = s,autopct="%0.1f ") plt.title("MY MARKS")
plt.legend()
plt.show()
```

9. Differentiate between Bar and Histogram

Histogram	Bar graph
Histogram refers to a graphical representation	A bar graph is a pictorial representation of data
To show the frequency of numerical data.	To compare different categories of data.
A histogram represents the frequency distribution of continuous variables.	A bar graph is a diagrammatic comparison of discrete variables.
Histogram presents numerical data	Bar graph shows categorical data.
The histogram is drawn in such a way that there is no gap between the bars.	Bar graph is proper spacing between bars in a bar graph that indicates discontinuity.
Items of the histogram are numbers, which are categorised together, to represent ranges of data.	The bar graph, items are considered as individual entities.

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