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ANNUAL EXAMINATION - 2023

STANDARD – 12

COMPUTER SCIENCE

PART – I

I. Choose the correct answer: **15 X 1 = 15**

1. B
2. C
3. B
4. B
5. D
6. A
7. B
8. B
9. B
10. B
11. D
12. D
13. D
14. A
15. A

PART – II

II. Answer ANY SIX questions. Qn.no.24 is compulsory: **6 x 2 = 12**

16. What is Tuple? Give an example.

- A tuple is a comma-separated sequence of values surrounded with parentheses.
- Tuple is similar to a list.
- Cannot change the elements of a tuple.

Example: Color= ('red', 'blue', 'Green')

17. What is scope?

Scope:

- Scope refers to the visibility of variables, parameters and functions in one

part of a program to another part of the same program.

18. How will you delete a string in Python?

- Python will not allow deleting a particular character in a string.
- Whereas you can remove entire string variable using **del** command.

Example:

```
del str1[2]
```

19. Write note on range() in loop.

range():

- The range( ) is a function used to generate a series of values in Python.
- Using range( ) function, you can create list with series of values.
- The range( ) function has three arguments.

Syntax of range ( ) function:

range (start value, end value, step value)

20. What is class?

Class:

- Class is the main building block in Python.
- Class is a template for the object.
- Object is a collection of data and function that act on those data.
- Objects are also called as instances of a class or class variable.

21. What is Data Manipulation Language?

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.

22. Mention the default modes of the File.

- The default is reading („r“) in text mode.
- In this mode, while reading from the file the data would be in the format of strings.

23. List general types of data visualization.

General types of data visualization:

- Charts
- Tables
- Graphs
- Maps
- Infographics
- Dashboards

24. What will be output of the following Python code?

```
Squares=[x**2 for x in range(1,11)]
Print(squares)
```

OUTPUT:

1 4 9 16 25 36 49 64 81 100

PART – III

III. Answer ANY SIX questions. Qn. no. 33 is compulsory: 6 x 3=18

25. Mention the characteristics of Interface.

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

26. What do you understand by Dynamic programming?

Dynamic programming:

- Dynamic programming is used when the solution to a problem can be viewed as the result of a sequence of decisions.
- Dynamic programming approach is similar to divide and conquer (i.e) the problem can be divided into smaller sub-problems.
- Results of the sub-problems can be re-used to complete the process.
- Dynamic programming approaches are used to find the solution in optimized way.

27. Explain Ternary operator with an example.

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 ifelse making the code compact.

Syntax:

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

Example :

min = 50 if 49<50 else 70 # Output**: min = 50**

28. Write the syntax of while loop.

Syntax:

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

29. 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
math.ceil (x)	math.floor (x)

30. What is difference between csv reader() method and DictReader() class?

Reader():	DictReader():
The reader function is designed to take each line of the file and make a list of all columns.	DictReader works by reading the first line of the CSV and using each comma separated value in this line as a dictionary key.
Using this method one can read data from csv files of different formats like quotes (" "), pipe (|) and comma (,).	DictReader is a class of csv module is used to read a CSV file into a dictionary.
csv. Reader work with list/tuple.	csv.DictReader work with dictionary.
Syntax: csv.reader(fileobject,delimiter,fmtparams)	

32 Write a python program to display the given pattern.

COMPUTER

COMPUTE

COMPUT

COMPU

COMP

COM

CO

C

CODE:

```
str="COMPUTER"
index=len(str)
        for i in str:
                print(str[:index])
        index-=1
```

PART – IV

IV. Answer the following questions: **5 X 5 = 25**

34. a) What is a List? Why list can be called as pairs? Explain with suitable example.

LIST:

- 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.
- The elements of a list can be accessed in two ways.

Multiple Assignment:

- Which unpacks a list into its elements and binds each element to a different name.

  Example:

  list := [10, 20]

  x, y := list

  x will become10 and ***y*** will become 20.

Element Selection Operator:

- It is 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.

Example:

list[0]

10

list[1]

20

PAIR:

- 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[(0,10),(1,20)]

OR

b) 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.
- If the values match, display the current index and value of the array
- If the values do not match, move on to the next array element. If no match is found, display the search element not found.
- If no match is found, display the search element not found.

Example:

- 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
values	10	12	20	25	30

- **Snippet:**
  - Input: values[] = {10,12,20,25,30}
  - Target=25
- **Output:**
  - 3

- **35.**

a)Discuss in details about token in Python.

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.
- Whitespace separation is necessary between tokens, identifiers or keywords.

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.
- **Example of valid identifiers:** Sum, total_marks, regno, num1

- **Example of invalid identifiers:** 12Name, name$, total-mark, continue

Keywords

- Keywords are special words used by Python interpreter to recognize the structure of program.
- Keywords have **specific meaning for interpreter**, they cannot be used for any other purpose.
- **Python Keywords:** false, class, if, elif, else, pass, break etc.

Operators

- **Operators are special symbols** which represent computations, conditional matching in programming.
- Operators are categorized as Arithmetic, Relational, Logical, Assignment and Conditional.
- Value and variables when used with operator are known as **operands**.

Example:

```
a=100
b=10
print ("The Sum = ",a+b)
print ("The a > b = ",a>b)
print ("The a > b or a == b = ",a>b or a==b)
a+=10
print("The a+=10 is =", a)
```

Output:

```
The Sum = 110
The a>b = True
The a > b or a == b = True
The a+=10 is= 110
```

Delimiters

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

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

Literals

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

1) **Numeric Literals** consists of digits and are immutable
2) **String literal** is a sequence of characters surrounded by quotes.
3) **Boolean literal** can have any of the two values: True or False.

OR

b) Explain the following built-in function.

(i) id()

(ii) chr()

(iii) round()

(iv) type()

(v) pow

Function	Description	Syntax	Example
id ( )	Return the "identity" of an object. i.e. the address of the object in memory.	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.	chr(i)	c=65 print (chr (c)) **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 print ('x value is rounded to', round (x)) **Output:** X value is rounded to 18
type ( )	Returns the type of object for the given single object.	type (object)	x= 15.2 print (type (x)) **Output:** <class 'float'>
pow ( )	Returns the computation of a,b i.e. (a**b) a raised to the power of b.	pow(a,b)	a= 5 b= 2 print (pow (a,b)) **Output:** 25

36.

a) What is nested tuple? Explain with an example.

Tuple:

- 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.

Nested Tuples:

- In Python, a tuple can be defined inside another tuple; 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 = (("Kishan", "XII-F", 98.7), ("Mani", "XII-H", 97.5), ("Ram", "XII-F",
95.3), ("Prabhu", "XII-G", 93.8))
        for i in Toppers:
                print(i)
```

Output:

```
(' Kishan ', 'XII-F', 98.7)
(' Mani ', 'XII-H', 97.5)
(' Ram ', 'XII-F', 95.3)
(' Prabhu ', 'XII-G', 93.8)
```

OR

b) Explain the different types of relationship mapping.

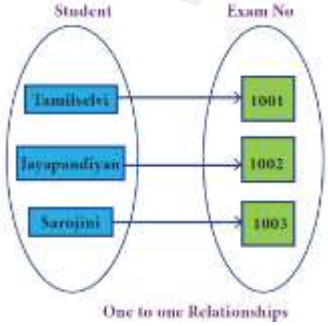
Types of Relationships : There are the types of relationships used in a database.

1. One-to-One Relationship
2. One-to-Many Relationship
3. Many-to-One Relationship
4. Many-to-Many Relationship

i.) 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.

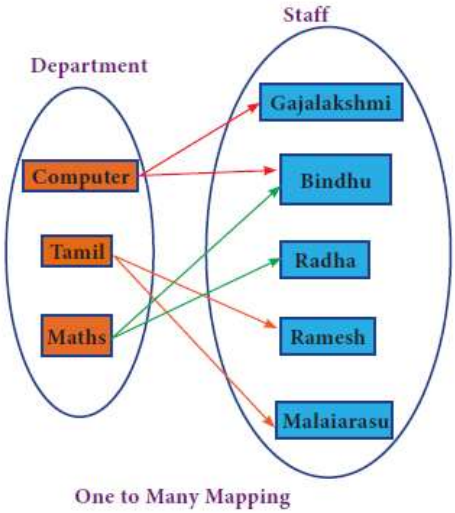
For Example: A student can have only one exam number.



ii. 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.



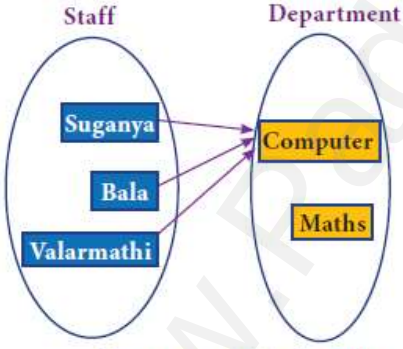
One to Many Mapping

iii. 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.

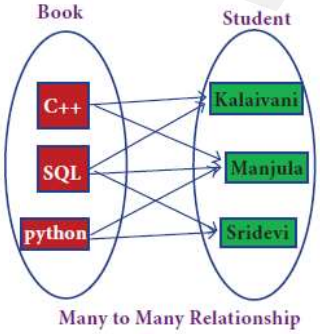


Many to one Relationship

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.

Example: Books and Student : Many Books in a Library are issued to many students.



Many to Many Relationship

37.

a) Explain about difference between Histogram and Bar Graph.

The differences between Histogram and bar graph are as follows
1. Histogram refers to a graphical representation; that displays data by way of bars to show the frequency of numerical data. A bar graph is a pictorial representation of data that uses bars to compare different categories of data.
2. A histogram represents the frequency distribution of continuous variables. Conversely, a bar graph is a diagrammatic comparison of discrete variables.
3. Histogram presents numerical data whereas bar graph shows categorical data.
4. The histogram is drawn in such a way that there is no gap between the bars. On the ot her hand, there is proper spacing between bars in a bar graph that indicates discontinuity.
5. Items of the histogram are numbers, which are categorised together, to represent ranges of data. As opposed to the bar graph, items are considered as individual entities.
6. In the case of a bar graph, it is quite common to rearrange the blocks, from highest to lowest. But with histogram, this cannot be done, as they are shown in the sequence of classes.
7. The width of rectangular blocks in a histogram may or may not be same while the width of the bars in a bar graph is always same.

OR

b) Explain 'continue' statement with an example.

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

Syntax:

continue

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

Output:

```
Jump Statmnt
End of the program
```

****

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