STD: XII   **FULL PORTION TEST**
Time Allowed: 3.00 Hrs.   **COMPUTER SCIENCE**   Maximum Marks: 70
Note: i) Answer all the questions.   **PART – I**   15 X 1 = 15

1. _____ is a NULL Statement.
   a) Goto   b) Break   c) Pass   d) Continue
2. Which of the following defines what an object can do?
   a) Operating System   b) Compiler   c) Interface   d) Interpreter
3. _____ does not allow to name the various parts of a multi-item object.
   a) List   b) Tuple   c) Sets   d) Class
4. The members that are accessible from within the class and are also available to its sub-classes is called
   a) Public members   b) Protected members c Secured members   d) Private members
5. The _____ 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.
   a) Bubble   b) Selection   c) Linear   d) Binary
6. _____ is often used to describe the worst-case of an algorithm.
   a) Big Omega   b) Big Oh   c) Big Θ   d) None of these
7. What plays a vital role in Python programming?
   a) Statements   b) Control   c) Structure   d) Indentation
8. 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
9. Which database model represents parent-child relationship?
   a) Relational   b) Network   c) Hierarchical   d) Object
10. The process of creating an object is called as:
    a) Constructor   b) Destructor   c) Initialize   d) Instantiation
11. A table is known as   a) Tuple   b) Attribute   c) Relation   d) Entity
12. Queries can be generated using
    a) SELECT   b) ORDER BY   c) MODIFY   d) ALTER
13. A framework for interfacing Python and C++ is
    a) Ctypes   b) SWIG   c) Cython   d) Boost
14. Any changes made in the values of the record should be saved by the command
    a) Save   b) Save As   c) Commit   d) Oblige
15. Which of the following module should be imported to visualize data and information in Python? a) csv   b) getopt   c) mysql   d) matplotlib

PART - II

Note: Answer any six questions Question No. 24 is compulsory   6 X 2 = 12
16. Why strlen is called pure function?.
17. What is abstract data type?
18. What is Mapping?
19. Write the phases of performance evaluation of an algorithm.
20. What is the difference between Select and Project command?
21. What is use of next() function?
22. What is literal? explain types of literals.
23. List the general types of data visualization

24. What is the Output of the following code:

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

PART - III

Note: Answer any six questions Question No. 33 is compulsory   6 X 3 = 18

25. Define Enclosed scope with an example.
26. Explain Cartesian Product with a suitable example.
27. Write a SQL statement to modify the student table structure by adding a new field.
28. What is the output for the following snippet:

```
>>> Marks = [10, 23, 41, 75]
>>> print (Marks[-1])
```

29. Write a class with two private class variables and print the sum using a method.
30. What is MinGW? What is its use?
31. What is normalization?
32. Write a Python program to read a CSV file with default delimiter comma (,).
33. What is the Output of the following code:

```
n=100
sum = 0
for counter in range(1,n+1):
sum = sum + counter
print("Sum of 1 until %d: %d" % (n,sum))
```

PART - IV

Note: Answer all the questions   5 X 5 = 25

34. a) Explain the Bubble sort algorithm with example.   **[OR]**
    b) Describe in detail the procedure Script mode programming.

35. a) What is the purpose of range()? Explain with an example.   **[OR]**
    b) Write a SQL statement to create a table for employee having any five fields and create a table constraint for the employee table.

36. a) Write the rules to be followed to format the data in a CSV file.   **[OR]**
    b) Write a Python program to execute the following c++ coding

```
#include <iostream>
using namespace std;
int main()
{ cout<<"WELCOME";
return(0);
}
```

    The above C++ program is saved in a file **welcome.cpp**

37. a) Write in brief about SQLite and the steps used to use it.   **[OR]**
    b) What are the components of SQL? Write the commands in each.

38. a) Explain the various buttons in a matplotlib window.   **[OR]**
    b) How will you access the multi-item. Explain with example.   **(FP – III)**

STD: XII   **III – REVISION TEST – 2024 [ANSWER KEY]**   **MARKS: 70**
SUB: COMPUTER SCIENCE   **TIME: 3 : Hrs**

PART – I

I. CHOOSE THE CORRECT ANSWER: 15 X 1 = 15

1. c) Pass
2. c) Interface
3. d) Class
4. b) Protected members
5. b) Selection
6. b) Big O
7. d) Indentation
8. d) Carriage Return and Line Feed
9. c) Hierarchical
10. d) Instantiation
11. c) Relation
12. a) SELECT
13. d) Boost
14. c) Commit
15. d) matplotlib

PART – II

II. ANSWER Any 6 QUESTIONS Q.No: 24 IS COMPULSORY: 6 X 2 = 12

16. Why strlen is called pure function?
   Ans: 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.

17. What is Abstract Data type?
   Ans: - Abstract Data Type (ADT) is a type for objects whose behaviour is defined by a set of values and operations.
   - The definition of ADT only mentions what operations are to be performed but not how these operations will be implemented.

18. What is Mapping?
   Ans: The process of binding a variable name with an object is called Mapping. **:=** (colon equal to sign) is used in programming languages to map the variable and object.

19. Write the phases of performance evaluation of an algorithm.
   Ans: Analysis of algorithms and performance evaluation can be divided into two different phases:
   i. **Priori estimates:** Theoretical performance analysis.
   ii. **A Posteriori testing:** Actual performance analysis.

20. What is the difference between Select and Project command?
   Ans:

SELECT	PROJECT
The SELECT operation is used for selecting a subset with tuples according to a given condition.	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.

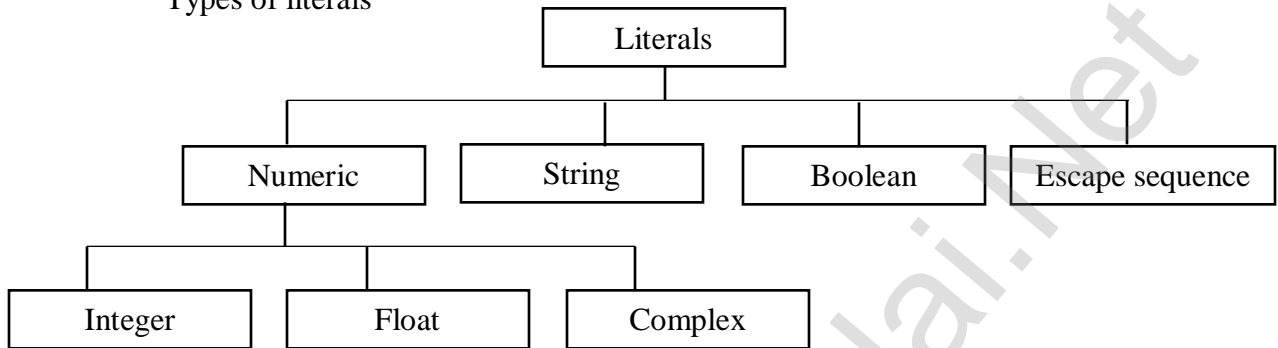**21. What is use of next( ) function?**

Ans: The next( ) function returns the next item from the iterator. It can also be used to skip a row of the csv file.

> **Example:**
> Reader = csv.reader(F)
> # skipping the first row(heading)
> next(reader)

22. What is a literal? Explain the types of literals?

Ans: Literal is a raw data given in a variable or constant.

Types of literals

```
                          Literals
            ┌──────────┬──────────┬──────────┐
         Numeric     String     Boolean   Escape sequence
    ┌────────┼────────┐
 Integer   Float   Complex
```

23. List the general types of data visualization.

Ans: - Charts, - Tables, - Graphs, - Maps, - Infographics, - Dashboards

24. What is the Output of the following code:

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

Ans:

```
OUTPUT:
 1
 1    2
 1    2    3
 1    2    3    4
 1    2    3    4    5
```

25. Define Enclosed scope with an example.

Ans: All programming languages permit functions to be nested. A function (method) with in another function is called nested function. 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.

```
Example:
disp( ):
  a: = 10    # enclosed scope
 disp1( ):
  b: = 20   # local scope
   print a
   print b
 disp1( )
disp( )
OUTPUT
10
20
```

26. Explain Cartesian Product with a suitable example.

Ans: 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.

EXAMPLE:

Table A		Table B		A X B	
A		B		A	B
1		+		1	+
2		−		1	−
3				2	+
				2	−
				3	+
				3	−

27. Write a SQL statement to modify the student table structure by adding a new field.
   Ans:

Table name	:	student
New filed to be added	:	area
Command used to add	:	ALTER
SQL statement	:	**ALTER TABLE Student ADD area char(20);**

28. What is the output for the following snippet:
   >> Marks = [10, 23, 41, 75]
   >> print (Marks[– 1])
   Ans:

```
OUTPUT:
75
```

29. Write a class with two private class variables and print the sum using a method.
   Ans:

```
class Sample:
   sum = 0                   # public data member - sum
   def _init_ (self,n1,n2):
      self._n1 = n1          # private data members_n1 and _n2
      self._n2 = n2
   def display(self):        # method display
       print("Class variable 1 = ", self._n1)
       print("Class variable 2 = ", self._n2)
   return self._n1 + self._n2
   S = Sample(12, 14)
   x = S.display( )
  print("The sum of two numbers is",x)
```

30. What is MinGW? What is its use?
   Ans: - MinGW (Minimalist GNU for Windows) 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 complier for C++ on Windows. MinGW allows to compile and execute C++ program dynamically through Python program using g++.

31. What is Normalization?
   Ans: Normalization reduces data redundancy and improves data integrity. Database Normalization was proposed by Dr. Edgar F Codd.

32. Write a Python program to read a CSV file with default delimiter comma(,)
   Ans:

```
#IMPORTING
import csv
#OPENING FILE - file name: FILE1.csv
data = csv.reader(open("FILE1.csv"))
#PRINTING FILE
for row in data:
 Print(row)
```

33. What is the output of the following code:

```
n = 100
sum = 0
for counter in range(1, n + 1 ):
sum = sum + counter
print("Sum of 1 until %d: %d" % (n,sum))
```

Ans:

OUTPUT:
Sum of 1 until 100: 1
Sum of 1 until 100: 3
Sum of 1 until 100: 6
Sum of 1 until 100: 10
Sum of 1 until 100: 15
Sum of 1 until 100: 21
Sum of 1 until 100: 28
Sum of 1 until 100: 36
Sum of 1 until 100: 45
Sum of 1 until 100: 55
Sum of 1 until 100: 66
Sum of 1 until 100: 78
Sum of 1 until 100: 91
Sum of 1 until 100: 105
Sum of 1 until 100: 120
Sum of 1 until 100: 136
Sum of 1 until 100: 153
Sum of 1 until 100: 171
Sum of 1 until 100: 190
Sum of 1 until 100: 210
Sum of 1 until 100: 231
Sum of 1 until 100: 253
Sum of 1 until 100: 276
Sum of 1 until 100: 300
Sum of 1 until 100: 325
Sum of 1 until 100: 351
Sum of 1 until 100: 378
Sum of 1 until 100: 406
Sum of 1 until 100: 435
Sum of 1 until 100: 465
Sum of 1 until 100: 496
Sum of 1 until 100: 528
Sum of 1 until 100: 561
Sum of 1 until 100: 595
Sum of 1 until 100: 630
Sum of 1 until 100: 666
Sum of 1 until 100: 703
Sum of 1 until 100: 741
Sum of 1 until 100: 780
Sum of 1 until 100: 820
Sum of 1 until 100: 861
Sum of 1 until 100: 903
Sum of 1 until 100: 946
Sum of 1 until 100: 990

Sum of 1 until 100: 1035
Sum of 1 until 100: 1081
Sum of 1 until 100: 1128
Sum of 1 until 100: 1176
Sum of 1 until 100: 1225
Sum of 1 until 100: 1275
Sum of 1 until 100: 1326
Sum of 1 until 100: 1378
Sum of 1 until 100: 1431
Sum of 1 until 100: 1485
Sum of 1 until 100: 1540
Sum of 1 until 100: 1596
Sum of 1 until 100: 1653
Sum of 1 until 100: 1711
Sum of 1 until 100: 1770
Sum of 1 until 100: 1830
Sum of 1 until 100: 1891
Sum of 1 until 100: 1953
Sum of 1 until 100: 2016
Sum of 1 until 100: 2080
Sum of 1 until 100: 2145
Sum of 1 until 100: 2211
Sum of 1 until 100: 2278
Sum of 1 until 100: 2346
Sum of 1 until 100: 2415
Sum of 1 until 100: 2485
Sum of 1 until 100: 2556
Sum of 1 until 100: 2628
Sum of 1 until 100: 2701
Sum of 1 until 100: 2775
Sum of 1 until 100: 2850
Sum of 1 until 100: 2926
Sum of 1 until 100: 3003
Sum of 1 until 100: 3081
Sum of 1 until 100: 3160
Sum of 1 until 100: 3240
Sum of 1 until 100: 3321
Sum of 1 until 100: 3403
Sum of 1 until 100: 3486
Sum of 1 until 100: 3570
Sum of 1 until 100: 3655
Sum of 1 until 100: 3741
Sum of 1 until 100: 3828
Sum of 1 until 100: 3916
Sum of 1 until 100: 4005
Sum of 1 until 100: 4095
Sum of 1 until 100: 4186
Sum of 1 until 100: 4278
Sum of 1 until 100: 4371
Sum of 1 until 100: 4465
Sum of 1 until 100: 4560
Sum of 1 until 100: 4656
Sum of 1 until 100: 4753
Sum of 1 until 100: 4851

PART – IV

IV. ANSWER ALL THE QUESTIONS: **5 X 5 = 25**

**34. a) Explain the Bubble sort algorithm with example.**

Ans: Bubble sort is a simple sorting algorithm. The algorithm is a comparison sort, is named for the way smaller elements "bubble" to the top of the list.
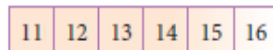
Procedure:

1. Start with the first element i.e., index = 0, compare the current element with the next element of the array.

2. If the current element is greater than the next element of the array, swap them.

3. 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.

Example: Assume list is an array of n elements. The swap function swaps the values of the given array elements. 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.
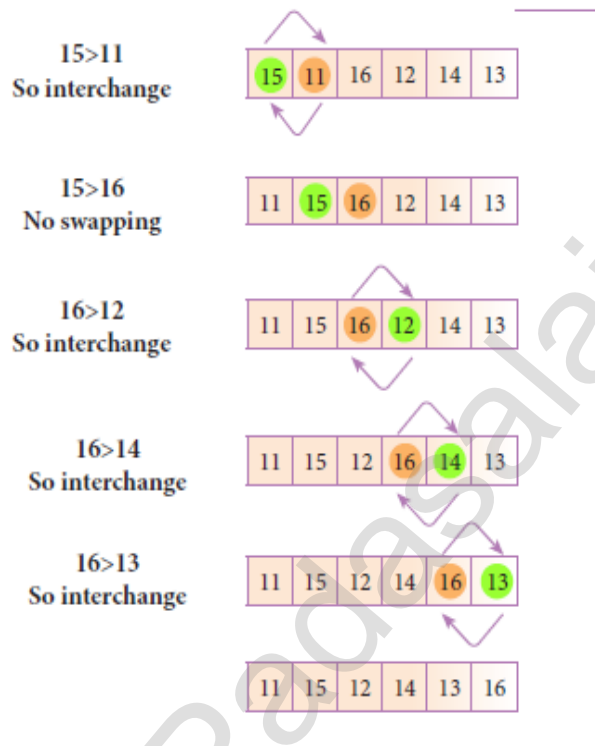
The above pictorial example is for iteration-1. Similarly, remaining iteration can be done. The final iteration will give the sorted array.

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

[OR]

b) Describe in detail the procedure Script mode programming.

Ans: A script is a text file containing the Python statements.

i. Creating Scripts in Python

- Choose **File** ⟶ **New File** or press **Ctrl + N** in Python shell window.
- Any **untitled** blank script text editor will be displayed
- Type the code in Script editor

ii. Saving Python Script
- Choose **File** ⟶ **Save** or Press **Ctrl + S**
- Save As dialog box appears
- Type the file name in **File Name** box with .py extension
- Click Save button

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.
- 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

35. a) What is the purpose of range( )? Explain with an example.

Ans: - The range( ) is a function use to generate a series of values in Python. Using range( ) function, a list is created with series of values.

- Syntax of range( ) function:

range (start value, end value, step value) where,

- The range( ) function has three arguments

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: Generating whole numbers upto 10

for x in range (1, 11, 1):

print(x)

OUTPUT:

1
2
3
4
5
6
7
8
9
10

[OR]

b) **Write a SQL statement to create a table for employee having any five fields and create a table constraint for the employee table.**

Ans:

Table name   : employee
No. of fields   : 5 (Empno, Empname, Age, Desig, Salary)
CREATE TABEL Student
(
Empno integer,
Empname char(20) NOT NULL,
Age integer (CHECH > 20),
Desig char(20) NOT NULL,
Salary integer (CHECK>10000), PRIMARY KEY (Empno)
);

Result:

   The above command creates a table

Empno	Empname	Age	Desig	Salary
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.

36. a) Write the rules to be followed to format the data in a CSV file.

Ans: Rule to be followed to format data in a CSV file:

   i. Each record (row of data) is to be located on a separate line, delimited by a line break by pressing enter key.

    For example: xxx, yyy ⏎

    ⏎ denotes enter Key to be pressed

  ii. The last record in the file may or may not have an ending line break

    For example: ppp, qqq ⏎

             yyy, xxx

 iii. There may be an optional header line appearing as the first line of the file with the same format as normal record lines. The header will contain names corresponding to the fields in the file and should contain the same number of fields as the records in the rest of the file.

    For example: field_name1, field_name2, filed_name3

             aaa, bbb, ccc ⏎

             zzz, yyy, xxx CRLF (**C**arriage **R**eturn and **L**ine **F**eed)

  iv. Within the header and each record, there may be one or more fields, separated by commas. Spaces are considered part of a field and should not be ignored. The last filed in the record must not be followed by a comma.

    For example: Red, Blue

   v. Each field may or may not be enclosed in double quotes. If fields are not enclosed with double quotes, then double quotes may not appear inside the fields.

    For example: "Red","Blue","Green" # Field data with double quotes

             Black, White, Yellow # Field data without double quotes

  vi. Fields containing line breaks (CRLF), double quotes, and commas should be enclosed in double quotes.

    For example: Red, **","**, Blue CRLF

    # comma itself is a field value. So it is enclosed with double quotes

     Red, Blue, Green

 vii. If double-quotes are used to enclose fields, then a double-quote appearing inside a field must be preceded with another double quote.

    For example: "Red", "Blue", "Green", #since double quotes is a filed value it is enclosed

              with another double quotes

  [OR]

b) Write a Python program to execute the following C++ coding

using namespace std;

```
int main( )
```
```
{
 cout<<"WELCOME";
 return(0);
}
```
The above C++ program is saved in a file **welcome.cpp**

Ans:

```
Open Notepad and type python program and save as welcome.py
import sys,os,getopt
def main(argv):
cppfile = "
exefile = "
opts, args = getopt.getopt(argv, "i:" , [ifile = '])
for o,a in opts:
if o in ("_i" , " ifile "):
cpp_file = a+ '.cpp'
exe_file = a+ '.exe'
run(cpp_file, exe_file)
def run(cpp_file, exe_file):
print("compiling" +cpp_file) os.system('g++' +cpp_file + '_o' + exe_file)
print("Running" + exe_file)
print("……")
print
os.system(exe_file)
print
if — name — == '–main –';
main(sys.argv[1:])

OUTPUT:
  WELCOME
```

37. a) Write in brief about SQLite and the steps used to use it.

   Ans: SQLite is a simple relational database system, which saves its data in regular data files or even

in the internal memory of the computer.

      Advantages:

- SQLite is designed to be embedded in applications, instead of using a separate database server program such as MySQLor Oracle.
- SQLite is fast, rigorously tested, and flexible.
- SQLite is easy to work.
- Python has a native library for SQLite.

Steps to use SQLite:

Step 1: Import the module sqlite3

      import sqlite3

Step 2: Create a connection using connect( ) method and pass the name of the database File.

      connection = sqlite3.connect("DB1.db")

Step 3: Set the cursor object cursor = connection. cursor( )

      cursor = connection.cursor( )

Example: To print records of employee table in descending order of Eno.

```
import sqlite3
connection = sqlite3.connect("organization.db")
cursor = connection.cursor( )
cursor.execute("SELECT * FROM Employee ORDER BY Eno DESC")
recs = cursor.fetchall( )
for r in recs:
    print(r)
cusor.close( )
```

[OR]

b) What are the components of SQL? Write the commands in each.

      Ans:

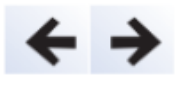| Type	Expansion	Usage	Commands
DDL	Data Definition Language	Commands used to define the database structure and schema	Create Drop Truncate Alter Table
DML	Data Manipulation Language	It is a query language used for adding (inserting), removing (deleting), modifying (updating) data in a database	Insert Update Delete
DCL	Data Control Language	Commands used to control the access of data stored in a database	Grant Revoke
TCL	Transaction Control Language	Commands used to manage transactions in the database	Commit Roll back Save Point
DQL	Data Query Language	Commands used to get desired results from the database tables	Select

38. a) Explain the various buttons in a matplotlib window.

Icons	Button	Description
🏠	Home	click this.to return back to the original view.
← →	Forward/Back	Forward ⟶ Move to a forward point. Back ⟶ Move to a previous point.
✛	Pan Axis	To click and drag the graph.
🔍	Zoom	To zoom • Select by click and drag on the graph. • Left click and drag ⟶ Zoom in the selected area • Right click and drag ⟶ Zoom out the selected area
≡	Configure Subplots	To configure various spacing options with your figure and plot.
💾	Save Figure	This button will allow you to save your figure in various forms.

[OR]

b) How will you access the multi-item. Explain with example.

Ans: To repesent multi-item, we can use the structure construct (In OOP langauge it's called class consturct) to repersent multi-part objects where each part is named (give a name). Consider the following pseudo code:

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

Here person is class name, creation is a function belonging to new data type,
firstname, lastname, id and email are called fields belonging to the new datatype.
Let main( ) contains

p1 := Person( )	Statement creates the object
firstname := "Padmashri"	Setting a field called FirstName with value Padmashri
lastname := "Baskar"	Setting a field called lastName with value Baskar
id := "994-222-1234"	Setting a field called id value 994-222-1234
email := "compsci@gmail.com"	Setting a field called email with value compsci@gmail.com
Output pf firstName : Padmashri	

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 a person is refererred to as a class or a type, while p1 is reffered to as an object or an instance.