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S. No. of Question Paper : 8460-A

Unique Paper Code : 32345104

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Name of the Paper : Programming Using Python

Name of the Course : Computer Science : G.E. for Honours

Semester : I

Duration : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Question No. 1 is compulsory.

Attempt any five questions out of Q. 2 to Q. 8.

Parts of a question must be answered together.

1. (a) What unit is used to measure the following : 1

(i) CPU Speed

(ii) Memory Size.

(b) Give the output of the following code snippet : 2

```
x, y = 2, 6
```

```
x, y = y, x + 2
```

```
print y
```

```
print x>>2
```

P.T.O.

(c) Given the set marks as :

2

```
marks = {60, 70, 75}
```

Give the output/indicate error in each of the following

code snippets :

2

(i) `marks1 = marks + {2}`

```
print(marks1)
```

(ii) `print(marks[1:])`

(d) The tuple `t` is defined as :

2

```
t = ("Ram", "Shyam", [40, 38])
```

Give the output/indicate error in each of the following

code snippets :

(i) `t[1] = "Lakhan"`

```
print(t)
```

(ii) `t[2][0] = 45`

```
print(t)
```

(e) Identify the error in the following code snippet : 2

```
x = 101
```

```
if (x%2) = 0:f
```

```
print("Even Number")
```

```
else
```

```
print("Odd Number")
```

(f) Define a class `Triangle`, each of whose instances comprises three attributes `side1`, `side2` and `side3`.

Define the constructor for the class.

1+2=3

(g) Given the list `names` as :

2

```
names = ["John", "Ben", "Walter", "Mike"]
```

Write a single code statement that sorts the list elements in the ascending order of length of the elements.

(h) A queue `myQueue` has two attributes, `front` and `rear` that contain indices of the first and last elements of `myQueue` at any instant. Consider that `myQueue` is

P.T.O.

initially empty. Show using diagrams, the contents of myQueue, when elements : 2

(i) "Sita", "Gita" and "Rita" are added to myQueue in that order.

(ii) One element is deleted from myQueue.

(i) Write a Python program that accepts as input your favorite color as a string. Interchange the first and last characters of your favorite color and display the resulting string. 3

(j) Write a function that takes as input a list of strings and a string (say str1) to be searched in the list. The function should use linear search to check whether the resulting string exists in the list. It should return True if the string is present in the list and False otherwise. (Do not use Python built-in functions for the search.) 3

(k) (i) Define a dictionary projects mapping Project ID to number of employees assigned to that project as per the following table :

Project ID	Number of Employees
"P1"	10
"P2"	6
"P3"	7

(ii) What will be the output produced on execution of the statement ?

```
print(max(projects))
```

(l) Which mode will you use to open a file in Python for writing to a file without overwriting the existing contents of that file ? 1

2. (a) Write a python program to take n numbers as input from the user and sort them using selection sort. Show the modified list at each step of selection sort. 6

- (b) Using a while loop, write a user defined python function to find the sum of all the positive numbers entered by the user. As soon as the user enters a negative number, stop taking in any further input from user and display the sum. 3

- (c) Give the output of the following code snippet : 1
 age = input("Enter your age and I
 will double it:")
 print(age*=2)

3. (a) Write a function func() that takes two parameters; a list empId and a list projId having corresponding projects that employees are working on. For example, 6

empId = [1,2,3,4]

projId = ["p1", "p2", "p1", "p1"]

The function func() returns a list of tuples, each of which includes projID, and the list of employees working on it. For instance, the function call func(empId, projId) would return [("p1", [1,3,4]), ("p2", [2])]. 6

- (b) A garment shop is offering 10% discount on garments for girls and 5% discount on garments of boys. In case the age of the child is below 5 years the discount offered is 15% irrespective whether the customer is a girl or a boy. Write a python program that takes as input the name, age, gender and price_of_items bought and displays the net payable amount. 4

4. (a) Write a Python function pattern(n) which takes a number n ($0 < n < 10$) as parameter and prints a pattern like the one shown below. For example, for n = 5, the following pattern is displayed : 4

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

- (b) Write a user defined function `sumSquares(n)` in Python that accepts a number `n` as an argument. The function returns sum of squares of first `n` numbers. Write a Python statement to call this function and print the result for `n=6`. 6

5. (a) Consider the sets `s1` and `s2` defined below : 4

`s1 = {"P1", "P2", "P3", "P4", "P5"}`

`s2 = {"P1", "P3", "P4"}`

What will be the output produced on execution of the following statements for the given sets :

(i) `set.symmetric_difference(s1, s2)`

(ii) `s1.union(s2)`

- (b) Consider the following string : 2

`msg = "Goodmorning! Welcome To This Class"`

Determine the output of the following functions :

(i) `msg.find("o")`

(ii) `msg.capitalize()`

- (c) Write a Python program to write lines of text to a file "File1.txt". Then close the file read the lines written to it and prints them. 4

6. (a) Evaluate the following postfix expression using a stack. 6

Show the contents of the stack at each step :

A B C * + D +

- (b) What will be the output of the following line : 2

`"sum of 2 and 3 is" + 5`

- (c) Write a Python program that reads a number in feet, converts it to meters, and displays the result. 2

One foot = 0.305 meters.

7. (a) Write a Python program to accept a string from the user. Replace all the vowels in the given string with the symbol "*". Display the modified string. 6

- (b) Create a dictionary `subj_stud` that maps a list of students to the subject they are studying as per the

following information :

Subject	Students
Maths	Joe, Sue, Ben
Physics	Joe, Mike, Michael
Biology	Sue, John
Computers	John, Chris

Write statements for finding the subjects with the minimum number of students and removing those subjects from subj_stud (in this case Biology and Computers).

8. Define a class Student storing information related to students of an institution. The class should contain the following data members :

4+3+3-10

- (i) rollNum : Student's Roll No,
- (ii) name : Student's name and
- (iii) percentage : Student's percentage.

The class should support the following methods :

- (i) Constructor
- (ii) set_percentage(newPercentage)
- (iii) get_data()

Write Python statements for the following :

- (i) Create an object stud1 of the class Student having rollNum as 101, name as "Bharat" and percentage as 79.
- (ii) Set the value of percentage to 81 for the object stud1 using set_percentage method.
- (iii) Display the values of all data members of stud1 using get_data method.