Your Roll No..................

Sr. No. of Question Paper : 6047   G

Unique Paper Code   :   62347502

Name of the Paper   :   Programming with Python (LOCF)

Name of the Course   :   **B.A. Programme LOCF**

Semester   :   V (Year of Admission 2019 onwards)

Duration : 3 Hours   Maximum Marks : 75

Instructions for Candidates

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

2. **Section A** is compulsory.

3. Attempt any **5 (five)** questions from **Section B**.

4. All parts of a question must be answered together.

P.T.O.

Section A

1. (a) Construct logical expressions for the following : (3)

    (i) Age is greater than 50 or experience is more than 7

    (ii) Sum of a, b, c is greater than or equal to 20

    (iii) Length of string "examination" is equal to 5

(b) Identify the valid and invalid identifiers : (3)

    import, roll-no1, 1temp, Str1, _factorial, Roll No

(c) Explain the purpose of constructor and destructor in class. (4)

(d) Differentiate between the following operator : (4)

    (i) = and ==

    (ii) / and //

(e) What is the output of the given code segment? Justify your answer. (3)

```
x=2

def test():

    x=x+1

    print(x)

test()

print(x)
```

(f) What is recursion? Explain it with the help of an example. (4)

(g) Write a range() function to generate the series 20, 18, 16, 14, 12, 10. (2)

(h) Evaluate the following expression : (2)

5 % 7 + 15 – 9 > 6 % 5 * 2 + 6

Section B

2. (a) Write a Python program to calculate the area of a triangle where its three side s1, s2 and s3 are given using the given formula :

$$s = (s1+s2+s3)/2$$

$$area = \sqrt{s(s - s1)(s - s2)(s - s3)}$$ (4)

(b) Write a Python program to find the sum of n terms of the following series : (4)

$$1 + 1/3.0 + 1/5.0 + \ ....$$

(c) When a=15 and b=12, give the output of the given expressions : (2)

a = 15   # 15 in binary: 00001111

b = 12   # 12 in binary: 00001100

(i) c = a & b

print(c)

(ii) c = a | b

print(c)

3. (a) Differentiate between break and continue statements. Give suitable examples. (3)

(b) Rewrite the following Python code using while loop : (3)

```
sum=0

for i in range(1,7,2):

    sum += i
```

(c) Write a function called remove vowels (word) which removes all the vowels ('a', 'e', 'i', 'o', 'u') in word and returns the word with the remaining characters. (4)

For example :

word = "Programming@2023"

Output of function removevowels (word) = "Prgrmmng@2023"

4. (a) A dictionary named Grades is created as *key: value* pair of *marks: Name*

Grades = {90: "Sahil", 65: "Abhijeet"}

Write Python statements to do the following :

- To print the values of Grades.

- To delete the *key: value* pair, 65: "Abhijeet".

- To print the maximum marks in dictionary Grades.

- To add a *key: value* pair 99 : "kuruss" in Grades.

- To find sum of the keys of Grades. (5)

(b) Write a Python program to arrange the elements of a given list in ascending order without using any in-built function. (5)

5. (a) Consider the tuples tuple1 = (12, 5, 2, 4, 17, 44, 7, 6, 10). Write Python statements to perform the following operations :

    (i) Display the last element from the tuple1.

    (ii) Calculate the sum of all the elements in the tuple1.

    (iii) Print first half of the tuple tuple1 in one line and the other half in another line.

    (iv) Convert tuple1 to a set. (4)

(b) Write a function to reverse a given number and find sum of digits of the given number. (6)

For example: If the given number is 2409, the reverse would be 9042 and the sum of digits would be 2+4+0=9=15.

6.   (a) Consider the following sets: (5)

Vehicles = {'Bicycle', 'Scooter', 'Car', 'Bike', 'Truck', 'Bus', 'Rickshaw'}

heavyVehicles = {'Truck', 'Bus'}

lightVehicles = {'Rickshaw', 'Scooter', 'Bike', 'Bicycle'}

Perform the following operations and give the output :

     (i) vehicles – heavyVehicles

     (ii) heavyVehicles . issubset (Vehicles)

     (iii) lightVehicles & heavyVehicles

     (iv) lightVehicles | heavyVehicles

     (v) heavyVehicles.symmetric_difference (lightVehicles)

(b) Write a Python program to print the prime numbers in a list of integers :   (5)

For example: list1 = [13, 34, 55, 67, 3, 89, 70, 200], the output will be 13, 67, 3, 89.

7. (a) Define a class Square. The class should have side of the square as a data member. Define the following methods : (6)

    (i) __init__ to initialize the data member side

    (ii) area() to calculate area of the square as side * side

    (iii) perimeter() to calculate the perimeter of the square as 4 * side

Create an object sql of the class Square, with the side as 20. Calculate its area and perimeter of sql and print it.

(b) Solve the following and write step by step execution : (4)

```
for 1 in range(1, 10, 1):
        for j in range(i, 20, i):
                if (i+j < 10):
                        print (i+j)
                else:
                        break
```