[This question paper contains 8 printed pages]

Your Roll No.   : ....

Sl. No. of Q. Paper   : 8564   J

Unique Paper Code   : 42341102

Name of the Course   : **B.Sc. (Prog.)/B.Sc. Mathematical Sciences**

Name of the Paper   : Problem Solving Using Computers

Semester   : I

Time : 3 Hours   *Maximum Marks : 75*

Instructions for Candidates :

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

    (b) **Section-A** is compulsory.

    (c) Answer any **five** questions from **Section-B**.

    (d) Answer **all** parts of a question together.

Section - A

1. (a) What do you understand by Byte. Write number of bytes in each of the following : 3

      (i) Megabyte

      (ii) Gigabyte

P.T.O.

(b) Given a=5, b=6 and c=4, find the value of following expressions   3

  (i) b//c*a

  (ii) b%c and a>c

  (iii) len("hello")>a

(c) Identify the syntax errors in the following code :   3

```
def f1:?
    a=b+5
    return a
f1(5)
```

(d) Rewrite the following for loop using while loop :   3

```
sum=0
for i in range(1,7,2):
    sum+=i
```

(e) Write try and except block to handle exception related to text file "file1.txt" that is to be opened in read mode. Display message "file not found" on the occurrence of the appropriate exception related to files.   3

(f) Evaluate the following functions :   3

  (i) math.ceil(8.6)

  (ii) min("xx","xz","aaa")

  (iii) abs(-5)

2

(g) Find the output of the following code :   2+2

```
(i) def fname(n):
        for i in range(n):
            if i==3:
                return 0
            else:
                print("i= ",i)
    print("output= ",fname(5))
```

```
(ii)    names={'DELHI':5,'BOMBAY':6,'GOA':3}
        print(list(names.keys())
        print(names.get('RANCHI','NONE'))
```

(h) Find the content of S after the execution of the following statements ?   3

```
S1="EXECUTION"
S=S1[0::3] *3
```

Section - B

2. (a) Given two lists L1=["red","green"] and L2=[3,5]. Write Python statement(s) to produce a list named **outlist** having following contents using L1 and L2: outlist=[('red', 3), ('green', 5)]. Also, display length of the outlist and its contents.   2+1

3   P.T.O.

(b) Given two lists NAMES1 and NAMES2 having names of students where the same name may appear in both lists. Write statements to do the following : 4

(i) Generate a list UnqNAMES to store all names without repetition from both NAMES1 and NAMES2.

(ii) Generate a list DupNAMES to have common names from both NAMES1 and NAMES2.

(c) Write PYTHON statements to accept positive integer only from the user. Use appropriate exception/assert statements for the same. 3

3. (a) Find the data type and content of the variable S2 after the execution of each of the following statements where S="Semester Examination" and S1="Finally" 5

(i) S2=S[:-12]+S1[:5]

(ii) S2=S1.find('l')+S1.rfind('l')

(iii) S2=S.split()

(b) Write a function that takes **str1** as parameter and replaces alternate character in str1 (starting from 0) with ' * ' and stores resultant string in **str2**. The function shall display the number of character replaced and shall return str2. For example if str1='Examination' then str2="*x*m*n*t*o*' and the number of character replaced is 6. 5

4. (a) Write a function named **fncompute** which takes **number** as parameter where number is a positive integer. The function returns the difference in maximum and minimum digit in the number i.e. if number is 7892, then difference is 9-2=7 5

(b) Write a function named **fnsearch** to search for an element X in a list L using linear search, where X and L are passed as parameters. The function should return all positions at which X is found else -1 if not found. Note that X may appear multiple times in the list. 5

5. (a) Consider the following list **X** of numbers : 5

100, 34, 45, 56, 19

Show step by step iterations for arranging the given list in increasing order using insertion sort.

(b) Write a recursive function to compute nth term of the fibonacci series. Fibonacci series has 0 and 1 as first term and second term respectively. The third and subsequent terms are computed as sum of previous two terms. 5

6. (a) Write appropriate file handling statements to do the following : 2+3

(i) Open a text file '**exam.txt**' and append message '**Good Morning**' in it

(ii) Display contents of a CSV file students.csv where fields are seperated by delimiter *

(b) Write a function fnfile() which reads a text file '**sentences.txt**' having sentences of different length and write only those sentences whose length is less than 10 in a new file '**output.txt**.' 5

7. (a) Write a function which accepts a list of names and returns a dictionary where key-value pairs are names and length of name respectively. 5

(b) Identify the local and global variables in the following code and find the output : 5

```
j=5

def fn(a,b=5):
    if a%b==0:
        print("Divisble")
    else:
        print("Non-Divisble")
    j=a+b
    print("in function j= ",j)

fn(15)

fn(16,3)

print("outside function j= ",j)
```

7 P.T.O.

8. (a) Write Python statement(s) to store all common factors of given two numbers no1 and no2 in a variable of type set.   3

(b) Define a class **CIRCLE** having a single data member **radius**. Include following methods in the class definition :   7

    (i) Constructor to initialize value to the data member.

    (ii) Method **getperimeter** to return the perimiter of the circle which is defined as 2*pi*radius.

    (iii) Method **getarea** to return the area of the circle which is defined as pi*radius^2.

After defining the class, create an object of CIRCLE with radius 5.