[This question paper contains 12 printed pages.]

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

Sr. No. of Question Paper : 1020 **D**

Unique Paper Code	:	2342011101
Name of the Paper	:	Programming using Python (DSC-1)
Name of the Course	:	**B.Sc. (H) Computer Science**
Semester	:	I

Duration : 3 Hours Maximum Marks : 90

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 **4** questions from **Section B**.
4. Parts of a question must be answered together.

SECTION A

(Compulsory)

1. (a) What is an algorithm? Write an algorithm to solve the quadratic equation. (4)

P.T.O.

(b) Write a function checkPrime(n) to check whether the given number n is prime or not. The function should return 1 if the number n is prime else 0. Call this function in main( ) to check the number input by the user. (4)

(c) Evaluate the following expressions: (4)

(i) 9+3*2**2 != 9//4-2 and 'hello' >= 'Hello world'

(ii) 20 ^ -22 & -5

(d) Consider the dictionary **groupDict** representing student details of a group. (4)

groupDict is defined as follows :

```
groupDict = {'group': {
                    'student': { 'name': 'Mike',
                    'marks':  { 'physics': 70, 'history': 80 }
                              }
                    },
                    'section': 'A'
            }
```

Write the python code snippets for the following operations :

(i) Access the value of the subject **Chemistry**.

(ii) Extract the value of the key **group**, and use the default value as -1 if key is not found.

(iii) Create a copy of a **groupDict** into a dictionary object **newGroup**.

(iv) print the dictionary **newGroup** after removing the element with the key **section**.

(e) Define a class Rectangle having the following structure: (6)

Attributes: length, breadth

Methods: __init__( ) for initializing the attributes.

getLength() which returns the length of the rectangle.

perimeter( ) which returns the perimeter of the rectangle.

(f) Find the output for the following python scripts: (8)

(i)
```
myString = 'Hello Everyone,Welcome to the session!'
print(myString [len(myString) :: -1])
print(myString [:-15] + myString [-15:])
print(myString.partition('Welcome'))
print(myString.rfind('to'))
```

(ii)
```
X = ['Red', 'Blue', 'Green']
Y = ['Yellow','White']
X.extend(Y)
X.append(23)
X.pop()
X.remove('Yellow')
print(X)
print(Y)
```

(iii)
```
try:
    num = 8
    print(num + 'hello')
    print(num / 4)
except ZeroDivisionError:
    print('Divided by zero')
except(ValueError,TypeError):
    print('Error occurred')
finally:
    print('Stop')
```

(iv)
```
monthDays = {'Januray': 31, 'February': 28, 'March': 31}
Month = monthDays
Month['February'] += 1
print('monthDays before clear-->', monthDays)
print('Month before clear-->', Month)
Month.clear()
print('monthDays after clear-->', monthDays)
print('Month after clear-->', Month)
```

SECTION B

2. (a) Write a program that accepts x and n as input to compute the following series. (6)

$$x - \frac{x^2}{2!} + \frac{x^3}{3!} - \frac{x^4}{4!} + \cdots \text{ n terms}$$

(b) Consider the following code snippet (9)

```
for k in 'Computer Science':
    if k = 'e':
        S1
    print(k, end = ", ")
```

Compare the output when **S1** is replaced with each of the following statements:

(i) break

(ii) continue

.(iii) pass

3. (a) Consider the following tuples (6)

T1 =(100, 200, 300)

T2 = ('Monday', 'Tuesday', 'Wednesday')

(i) Write a function **swapTuple(T1, T2)** to swap the values of **T1** and **T2**.

The expected output is as follows:

T1 = ('Monday', 'Tuesday', 'Wednesday')

T2 = (100, 200, 300)

(ii) Write a function **mergeTuple(T1, T2)** to return a list of tuples containing the corresponding element from tuples T1 and T2. The expected output is as follows :

T3 = [('Monday', 100), ('Tuesday', 200), ('Wednesday', 300)]

(b) Consider list **L1** as follows : (9)

L1 = [100, 200, 300, [400,500]]

Write code snippets to create the following lists :

(i) L2 as a shallow copy of L1

(ii) L3 as a deep copy of L1.

Demonstrate the effect of the following modifications in L1, L2 and L3:

(i) L1[2] = 900

(ii) L1[3][0] = 700

4. (a) Write a function **doubleDict()** that creates the dictionary **Dict1** where the keys are numbers between 1 and 5 and values are twice the keys. For example: if the key is 5, its value is 10. The function should return the dictionary **Dict1**.

Write a program that calls **doubleDict( )** and prints the values of the following operations when applied to the **Dict1**.

(i) maximum key

(ii) sum of keys (7)

(b) Consider two lists Lst1 and Lst2 declared as follows : (8)

Lst1 = ['green', 'blue']

Lst2 = ['blue', 'yellow']

Write a python script to do the following :

(i) Convert list Lst1 as set **S1** and **Lst2** as set **S2**.

(ii) Add the elements of the list ['black', 'cyan'] to **S2**.

(iii) Find the symmetric difference between sets **S1** and **S2**.

(iv) Create a set **newSet** using set comprehension containing elements of S1 with 's' added at the end of each element. The **newSet** should appear as:

newSet = {'blues', 'greens'}

5. (a) Consider the **function percentage(marks, total)** that computes the percentage of marks for a student. (6)

```
def percentage (marks, total):
    try:
        percent = (marks/total) * 100
    except ValueError:
        print('Value Error')
    except TypeError:
        print('Type Error')
    except ZeroDivisionError:
        print('Zero Division Error')
    except:
        print('Any other error')
    else:
        print(percent)
    finally:
        print('Completed!')
```

Explain the output corresponding to the following function calls.

(i) percentage (17.0, 20.0)

(ii) percentage (19.0, 0.0)

(iii) percentage ('200.0', 200.0)

(b) Define the following functions to perform the operations on a string. (9)

(i) countVowel(Str1) to count the vowels in a string.

(ii) replaceChar(Str1) to replace all occurrence of the character 'a' with a space.

(iii) reverseString(Str1) to reverse a string

Write a program to call these functions and provide the output for the given string Str1.

Str1 = 'Happiness depends upon ourselves!'

6. (a) Find the error(s) in the following code snippets: (3)

(i)
```
file1 = open('Myfile', 'w')
file1.read()
file1.close()
```

(ii)
```
tuple1 = (2120, 'abc')
del tuple1[0]
```

(b) Explain the type of exception raised in the following statements : (4)

(i) x=0
print(5/x)

(ii) print('The amount for the day is :' + 300)

(iii) int('Morning')

(iv) L1 = [11,22,33,44,55]
print(L1[5])

(c) Describe the following methods for the class objects with suitable examples. (8)

(i) __init__

(ii) __str__

(iii) __del__

(iv) __main__

7. (a) Write a function sumDigits(Num) which computes the sum of digits of a number Num and returns it. (5)

(b) Write a program to read a file myFile and perform the following operations: (10)

(i) print the total number of lines in the file.

(ii) copy even lines of the file to a file named evenFile and odd lines to another file named oddFile.