[This question paper contains 12 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1357 **I**

Unique Paper Code : 2512011101

Name of the Paper : Programming Fundamentals using Python

Name of the Course : **B.Sc. (H) Electronics (Core)**

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. Attempt **5** questions in all.
3. Question No. **1** is compulsory.
4. **All** questions carry equal marks.

P.T.O.

1. (a) Evaluate the following expression: (3)

```
5 % 10 + 10 – 25 * 8 // 5
```

(b) What will be the output produced on the execution of the following code snippet? (3)

```
for index in range(30,12,–5) :
    print(index, end =' ')
```

(c) In the given code snippet, state the value of M after execution of each statement: (3)

```
M = [10,20,30,20]
M.append(80)
print(M)
M.remove(20)
print(M)
M.extend(['fragnance'])
print(M)
```

(d) Differentiate between Encapsulation and Abstraction with suitable examples. (3)

(e) Consider the popularity of different programming languages stored in form of list as shown below : (3)

languages = ["Python", "JavaScript", "Java", "C#", "C++", "Ruby"]

popularity = [29.9, 19.1, 15.2, 10.3, 8.7, 5.1]

Give appropriate title to the graph and add add xticks separated by a distance of 4 units and yticks separated by a distance of 3 units.

(f) Differentiate between the keywords break and continue in Python with suitable examples. (3)

2. (a) Write a program that reads a number and check whether it is positive, negative or zero. (6)

(b) What will be the output produced on the execution of the following code snippet? (6)

```
num = 10
while num > 0:
    print(num)
    num -= 2
    if num == 3:
        break
else:
    print("Done")
```

(c) Identify the output/error (if any) for the following. Justify your answer if it is an error. (6)

(i)
```
set_of_code={'Alpha', 'Beta', 'Gamma'}
print(set_of_code[2])
```

(ii)
```
tupl=(8)
print(tup1.index(8))
```

(iii)
```
list1 = [10, 7, 3, 'Add', 20]
print(sum(list1))
```

(iv)
```
str1='Hi, uhere are you?'
str1[4]='w'
```

(v)
```
Ascii= {'A':65, 'B':66, 'A':67}
Ascii.pop('A')
print(Ascii)
```

3. (a) Consider the following nested list : (6)

```
studMarks = [['Sandhya', 90], ['Sita', 76],
['Shyam', 56]]
```

Write a program to determine the number of students who have obtained distinction (>=75).

(b) Consider the following string : (6)

greeting = 'Good Morning. Have a Good Day!!'

What will be the output produced on executing each of the statements/function calls?

(i) greeting[–len(greeting): len(greeting)]

(ii) greeting[:–12] + greeting[–12:]

(iii) greeting.isalpha()

(iv) greeting.istitle()

(v) greeting.replace('Good', 'Sweet')

(vi) greeting.endswith('!!')

(c) Consider the following function : (6)

```
def myFun(a, b = 1):
    return a + b
```

What will be the output produced when the following calls are made?

(i) myFun(b = 7)

(ii) myFun(2)

4. (a) Define a function areaTriangle() that takes the lengths of three sides: side1, side2, and side3 of the triangle as the input parameters and returns the area of the triangle as the output. Also, define a function main() that accepts inputs from the user interactively and computes the area of the triangle using the function areaTriangle(). Also, assert that sum of the length of any two sides is greater than the third side. (6)

(b) If a=10, b=12, c=0. find the values of following expressions : (6)

(i) a!=6 and b>5

(ii) a==9 or b <3

(iii) not (a<10)

(iv) not(a>5 and c)

(v) 5 and c!=8 or not c

(vi) a**b*c

(c) What will be the output produced on the execution of the following code snippet? (6)

```
a = 1
def f():
    print('Value of 'a' Inside f() : ', a)
def g():
    a = 2
    print('Value of 'a' Inside g() : ', a)
def h():
    global a
    a = 3
    print('Value of 'a' Inside h() : ', a)
print('global : ', a)
f()
print('Value of 'a' after f() : ', a)
g()
print('Value of 'a' after g() : ', a)
h()
print('Value of 'a' after h() : ', a)
```

5. (a) Write a program to check whether a given number is prime or not. (6)

(b) What will be the output produced on the execution of the following code snippet? (6)

```
color = set(['White', 'Green', 'Yellow', 'Blue'])

primary = set(['Red', 'Green'])

print('Green' in color)

allcolor=color.union(primary)

print(allcolor)

print(color.intersection(primary))

print(color.difference(primary))
```

(c) Consider the following string : (6)

Pname = "Programming Fundamentals Using Python"

What will be the output produced on executing the following statements?

(i) Pname.count('P')

(ii) Pname.swapcase()

(iii) Pname.rfind('h')

(iv) Pname.split(' ')

6. (a) Differentiate between class variable and instance variable. (6)

Write a complete program that defines a class Bank that keeps track of the bank customers. The class should contain the following data members:

accountNum – Account number of the customer

name – Name of the customer

balance – Amount deposited in account.

The class should contain the following methods :

(i) __init__ for initializing the data members.

(ii) deposit() to deposit money in the bank account.

(iii) __str__() that returns string representation for displaying the data members in a suitable manner.

(b) Consider the following Pandas DataFrame that represents the monthly revenue of a company for the first quarter of the year : (6)

```
import pandas as pd

data = {"Revenue": [55000, 62000, 58000]}

df = pd.DataFrame(data, index=["January", "February",
"March"])
```

Perform the following tasks:

(i) Calculate the total revenue for the first quarter.

(ii) Identify the month with the highest revenue.

(iii) Create a new column called "Revenue Category" where revenue greater than 60,000 is labeled as "High" and the rest as "Low."

(c) Write a program that takes the number of lines n as an input from the user and prints the following pattern (say, for n = 6) : (6)

```
* * * * * *
*         *
*         *
*         *
*         *
* * * * * *
```

7. (a) The monthly sale and income values of a shop are as below : (6)

Month	1	2	3	4	5	6
Sale	100	200	300	300	250	400
Income	10	15	30	20	20	45

Write a program to show Monthly Sale and Income as subplots.

(b) Consider the following recursive function : (6)

```
def recurFunc(n):
    if n==0:
        return 1
    else:
        return n * recurFunc(n-1)
```

Determine and explain the output produced on execution of the following statements :

```
result = recurFunc(3)
print(result)
```

(c) What will be output for each print statements listed below (i) to (v) for the code snippet? (6)

```
import numpy as np

arr_2d =

np.array(([5,10,15], [20,25,30], [35,40,45]))
```

(i) print(arr_2d)

(ii) print(arr_2d[1])

(iii) print(arr_2d[1][0])

(iv) print(arr_2d[2,:])

(v) print(arr_2d[::])