End Term Examination

Advanced Programming Language – Python

IIIT Lucknow

Max Marks: 70 3 Hrs All Questions Compulsory.

Note: For code related questions try answering in as close to correct syntax as possible

1. When you run a python program in Google Colab is it Compilation or Interpretation. Explain with reasoning. (4 marks)

2. Lists:
Given the list: numbers = [1, 2, 3, 4, 5] (6 marks)

Question: How do you

a. Retrieve the element 4 using negative indexing?
b. Using : how do we retrieve 2,3, 4
c. Update the third element to 7
d. Append the element 1 to the end of the list
e. Find the position of occurrence of 1
f. Return the descending order of the list

3. Dictionaries:
Given the dictionary: scores = {'Alice': 90, 'Bob': 85, 'Charlie': 92}

Question: How do you (4 marks)

A. Retrieve Bob's score from the dictionary?
B. Update Bobs score to 99
C. Form a series from the dictionary
D. Run a vectorized operation of doubling every number in the series

4. Pandas Series:[6 marks]

a. Using pandas, create a Series from the list [10, 20, 30, 40] and display the element at index 2.

b. How do you create a Series with custom index labels ['a', 'b', 'c'] for the list [100, 200, 300]?

c. Create a series with numpy log of all elements in the series

5. Given a number n return the list of all prime numbers till n.(4 marks)
6. Given a dataframe as below (16 marks)
data = { 'EmpID': [101, 102, 103, 104, 105], 'Name': ['Alice', 'Bob', 'Charlie', 'Diana', 'Ethan'], 'BMI': [28, 34, 25, 29, 32], 'Department': ['HR', 'Finance', 'IT', 'Marketing', 'Sales'], 'Salary': [55000, 65000, 60000, 58000, 63000] }
6.1 Find the shape of the dataframe. Suggest discrete and continuous columns

6.2 For the discrete columns do the complete descriptive analysis
6.3 For the continuous columns do the complete descriptive analysis with measures of central tendency and dispersion
6.4 Return a slice with third and fourth row, and second and third column
6.5 Return the columns name and BMI for the dataframe where salary < 60000
6.6 Add a column Height with example data to the dataframe
6.7 Add a new row with example data
6.8 Delete the new column Height. Then return the shape

7. Write a program to compute the factorial of double of an input number n. Create an exception for scenario of n <=0 and return an exception statement in that case. (5 marks)

8. Write a program to read all the lines from a given file f, with catching exceptions and printing messages appropriately for file not found, error in reading the file, or any other exception, and finally a message for successful reading. (5 marks)

9. Write a formatted string for output of a function describeNo which takes an input n, and returns whether the input n is greater than 10, or between 0 and 10, or less than 0. [6 marks]

10. What will be the output in case of the following statements(4 marks)

a.

```
person = {'name': 'Srini', 'age': 34}
"Hello, {name}. You are {age}.".format(**person)
```

b.

```
person = {'name': 'Eric', 'age': 74}
"Hello, {name}. You are {age}.".format(name=person['name'],
age=person['age'])
```

11. Using lamba, map filter and reduce functions given a list L of integers, return S which is the sum of twice of all numbers in L greater than 5. (5 marks)

12. Illustrate an example for a real world scenario to explain Multiple Inheritance and Multi Level Inheritance (5 marks)