

**Birla Institute of Technology and Science, Pilani**

Mid-semester examination

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**Programming for Analytics**

MPBA G507

Total marks : 100

Time : 4:00 pm - 5:30 pm (90 minutes)

*Attempt all 9 questions*

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1. Match the following 10
- |                   |  |
|-------------------|--|
| A. Data wrangling | 1. Function calling function (itself)      |
| B. Stack          | 2. Implementation using if-else and switch |
| C. Data Frame     | 3. Homogeneous data structure              |
| D. Exceptions     | 4. Last In Last Out                        |
| E. Tuple          | 5. Non linear data structure               |
| F. Branching      | 6. Errors generated during execution       |
| G. Queue          | 7. Heterogeneous data structure            |
| H. Matrix         | 8. Manipulation of data                    |
| I. Recursion      | 9. Last In First Out                       |
| J. Graph          | 10. Immutable data structure               |
2. Define the purpose of **str ()** function in R & Python language. 2
3. Define following terms 3
- Data munging
  - Data modeling
  - Data visualization
4. Draw the general/ideal shape for following plots for a normally distributed random distribution with **sample size > 1000** 8
- Histogram
  - Line plot
  - Pie plot
  - Box plot

5. Observe the following **Python** code

5

```
Name = "Hello"
```

which of the following code will print the element 'l' from the name string.

Answer all correct options if any

- a. `print(Name[3])`
- b. `print(Name[-2])`
- c. `print(Name[-3])`
- d. `print(Name[-1-1-1])`
- e. `print(Name[1+1])`

6. Explain the purpose of `dotchart()` function in R

2

**or**

Explain the purpose of **violin plot**

7. Compare the features of programming with other tools of analytics showing the importance of programming. (At least **10** features)

20

8. Write the differences (At least **10**) between R & Python programming languages

20

9. Following is a programming problem which requires **debugging** skill and is based on hand **simulation** of a Python interpreter.

*Instructions :*

- Write the output of following Python code 10
- Perform a simulation by hand (using Pen and Paper) for following Python code. +
  - Write down the step-by-step output of each line (showing line number) of this code where some assignment of a value to a variable takes place. 20
  - Mention the value of all variables (such as `input_list1`, `input_list2`, `input_list`, `loop_list`, `i`, `output` etc.) after execution of each line (if it gets created).

You may use following table as a template for writing your simulation results

Line no.	i	loop_list	output	input_list1	input_list2	input_list
10				[10,20,30,40]		
11				[10,20,30,40]	[2,4,15]	

```
1 import numpy as np
2
3 def loop(input_list):
4     loop_list = [0, 0, 0, 0]
5     for i in range(1, len(input_list)):
6         if i < 4:
7             loop_list[i-1] = input_list[i] - input_list[i-1]
8     return(loop_list)
9
10 input_list1 = [10, 20, 30, 40]
11 input_list2 = [2, 4, 15]
12 output = []
13
14 try:
15     output = np.divide(input_list1, input_list2)
16     print("1")
17 except:
18     print("2")
19     input_list2.append(20)
20     output = np.divide(input_list1, input_list2)
21     if output[-2] == 2:
22         print(output[3])
23         print(loop(output))
24     else:
25         loop(input_list1)
26 finally:
27     print("4")
28 print(output)
```