

**Indian Maritime University**  
**(A Central University, Govt of India)**  
**End Semester Examinations – December 2022**  
**Programme Name: B Tech (ME)**  
**Semester: III**  
**Subject Code: UG11T4305**

**Subject Name: Statistics and Data Analysis Using Python and R**

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Date: 21.12.2022

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

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General Instructions

- (i) All Sections (A, B & C) are to be attempted.
- (ii) Options, if any, are specified in the respective section.
- (iii) Scientific calculator is permitted.

**Section A**

**MCQs –All Questions are Compulsory. (10×01 mark = 10 Marks)**

1. Who developed Python Programming Language?
  - a. Alexander G. Bell
  - b. Vincent van Gogh
  - c. Leonardo da Vinci
  - d. Guido van Rossum
2. Which of the following Python sequence data type is immutable?
  - a. list
  - b. dictionary
  - c. tuple
  - d. array
3. Which of the following character is used to give single-line comments in Python?
  - a. //
  - b. #
  - c. /\*
  - d. !
4. Which of the following statements is used to create an empty set in Python?
  - a. []
  - b. {}
  - c. ()
  - d. set()

5. Which keyword is used for function?
- function
  - def
  - fun
  - define
6. In order to store values in terms of key and value we use what core data type?
- list
  - dictionary
  - Tuple
  - class
7. which of the following is used to define a block of code in Python Language?
- Indentation
  - Key
  - Brackets
  - None of the above
8. The shape of the distribution is symmetrical if
- Mean < Median
  - Mean > Median
  - Mean is about equal to median
  - Shape does not depend on mean and median
9. Given the following bivariate probability distribution,

Y \ X	-1	0	1
0	1/15	2/15	1/15
1	3/15	2/15	1/15
2	2/15	1/15	2/15

Then the marginal distributions of X is

a.

X	-1	0	1
P(X=x)	2/5	1/3	4/15

b.

X	-1	0	1
P(X=x)	1/15	2/15	1/15

c.

X	-1	0	1
P(X=x)	3/15	2/15	1/15

d.

X	-1	0	1
P(X=x)	2/15	1/15	2/15

10. Which one of the following variables is not categorical?

- a. Age of a person.
- b. Gender of a person: male or female.
- c. Choice on a test item: true or false.
- d. Marital status of a person (single, married, divorced, other)

### **Section B**

**Answer all the Questions.**

**(05×02 marks=10 Marks)**

11. Write the difference between a List and Tuple in Python. 2 Marks

12. What are the features of NumPy? 2 Marks

13. Explain Local & Global variables with example. 2 Marks

14. The data given below show the number of customers visited a store in a fort- night.

40, 62, 25, 2, 50, 80,73,59, 59, 60,85, 150,49,50,39

Find the inter quartile range. 2 Marks

15. Write a R program to add and divide two vectors of integers type and

length 5,  $x = (10, 20, 30, 25, 55)$  and  $y = (20, 10, 40, 5, 10)$ .

2 Marks

### **Section C**

**Answer any 5 of the following 7 questions.**

**(05×10 marks=50 Marks)**

16.

a) Explain any two Sequence data type operations with the help of an example.

5 Marks

b) Write a python script for text file handling to read, write and append mode.

5 Marks

17.

a) What do you mean by data visualization? Explain data visualizing libraries in python.

5 Marks

b) Explain in detail while and for loops in python with suitable examples.

5 Marks

18.

a) List down types of operators in Python. Explain relational operators. 5 Marks

b) Explain different data types supported by Python. 5 Marks

19.

a) Write a python program for the creation of 1-D & 2-D NumPy array. 5 Marks

1-D array containing the values 1,2,3,4,5

2-D array containing two arrays with the values 1,2,3 & 4,5,6

b) Explain key features of Pandas library. 5 Marks

20.

a. Let x and y be jointly continuous random variables having joint density

$$f(x,y) = \begin{cases} 2y & 0 \leq x \leq 1, 0 \leq y \leq 1 \\ 0 & \text{otherwise} \end{cases}$$

Determine  $P(y \leq \frac{1}{2})$

5 Marks

b. Find correlation coefficient and comment on the data given below. 5 Marks

x	3	6	8	11	12	10	7	9
y	10	9	7	9	8	9	6	5

21.

a. Explain features of Python programming. 5 marks

b. Write output of the following R program. 5 marks

```
print("New vector using seq() function-")
v = seq(3, 15, by= 3)
print("Original vector:")
print(v)
print("Test whether the value > 10 or not:")
print(v > 10)
```

22.

A newly developed bike is tested for its mileage (Km/Ltr petrol). The following data reveal the number of times the bike is giving the mileage.

Mileage (Km/Ltr petrol).	40-45	45-50	50-55	55-60	60-65	65-70	70-75
No. of times	3	5	5	7	4	1	1

Obtain mean mileage and standard deviation of mileage of bike?

10 marks

Tolani

