

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



M.Sc. DEGREE EXAMINATION – STATISTICS

THIRD SEMESTER – NOVEMBER 2019

18PST3ID01 – MATHEMATICAL AND STATISTICAL COMPUTING

Date: 04-11-2019

Dept. No.

Max. : 100 Marks

Time: 09:00-12:00

Part A

Answer all the questions

10 X 2 = 20

1. What is the output of the following python programming?
for val in "STATISTICS":
 if val == I:
 continue
 print(val)
2. Give a suitable example for inner function in Python.
3. What is if statement in Python? Give an example.
4. Explain for...loop statement in Python.
5. Write a user defined function to find out the length of a given list values.
6. How do you import a specific data sheet in Excel file into Python platform?
7. Specify the use of the commands *format long* and *format short* in command window.
8. Define interpolation
9. Let $X = \{22, 4, 6, 9, 12, 33, 7, 3\}$. Write down the MATLAB command to compute mean and median of X.
10. How do we represent the polynomial $3x^3 + 5x^2 - 7$ in MATLAB?

Part B

Answer any five questions

5 X 8 = 40

11. Explain the following Python statements with suitable example:
a) Python list b) Python dictionary c) Python set d) Python tuple
12. Illustrate any four types of packages in Python.
13. Explain the following statements:
a) Python Variable b) Python Constants c) Python strings
d) Python numbers
14. Describe Comparison operators in Python with examples.
15. Write a user defined function in Python to calculate mean and standard deviation for 10, 20, 30, 40, 50, 60, 70, 80, 90, 100.
16. Explain the following MATLAB commands:
(a) whos (b) ceil (c) rand (d) xor
(e) ones (f) fliplr (g) rot90 (h) diff
17. What is meant by a user define function in MATLAB? Explain it by using an example.

18. Given a system $Ax = b$, where $A = \begin{bmatrix} 1 & 4 \\ -5 & 3 \end{bmatrix}$, $x = \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$, $b = \begin{bmatrix} 3 \\ 4 \end{bmatrix}$. Write the MATLAB commands to compute the following (i) rank of A (ii) determinant of A (iv) inverse of A (v) solution for x_1 & x_2 .

Part C

Answer any two questions

2 X 20 = 40

19. Write a user defined function in Python to calculate beta coefficient and R^2 in Python for simple Regression Analysis.

20. Write a user defined function in Python programming to calculate paired t test and one sample t test for assumed dataset.

21. a) Write a function in python to calculate Spearman Rank Correlation coefficient for the following dataset.

Rank of Judge1: 10 2 7 5 9 3 1 8 4 6

Rank of Judge2: 9 3 6 4 10 1 2 5 7 8

b) Write a short note on different looping statements in MATLAB using suitable examples.

22. a) Explain the method to change the plot colour, line styles, and data markers.

b) Write MATLAB commands to evaluate the following:

(i) $y = 3x^{-4} + 5x^2$

(ii) $y = 3 \frac{\cos 2x}{4}$

(iii) $y = 11x^{0.12} + \frac{2}{x^{0.43}}$

(iv) $\int \sin 3x dx$

(v) $\frac{d^2}{dx^2} (\tan x)$

(10 + 10)
