



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc.DEGREE EXAMINATION – STATISTICS

THIRD SEMESTER – NOVEMBER 2017

16PST3ID01- MATHEMATICAL AND STATISTICAL COMPUTING

Date: 13-11-2017
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

Part A

Answer all the questions

10 X 2 = 20

1. Write a Python program to print “Welcome to Python”
2. How to add integer and float numbers in Python.
3. How to calculate 2 to the power 100 in Python.
4. Convert ‘statistics’ into upper case using Python code
5. Explain “append” command.
6. What is “list” in Python?
7. Name the four default windows in MATLAB.
8. Write down the syntax of IF ELSE statement.
9. Let $X = \{11, 7, 9, 4, 8, 6, 10, 22\}$. Write down the MATLAB command to compute mean and median of X.
10. Mention the use of polyval and polyfit functions in MATLAB.

Part B

Answer any five questions

5 X 8 = 40

11. Explain the command “sort”, “reverse” with suitable examples
12. Write a Python programme using while loop statement to print the following output.
The count is: 0
The count is: 1
The count is: 2
The count is: 3
The count is: 4
The count is: 5
13. Explain the statement “describe” and “goupby” with examples.
14. Write a Python code to construct a simple bar diagram and displaying values on bars.
15. Generate random sample of size 100 from Normal distribution between 10 and 20 and hence construct pairwise scatter plot.
16. Mention the uses of: fliplr, flipud, rot90 & repmat keywords in MATLAB.
17. Write a short note on output statements in MATLAB using appropriate examples.
18. Write the description for the following commands:
i) bar(x,y) ii) hist(y) iii) hist (y, x) iv) loglog

Part C

Answer any two questions

2 X 20 = 40

19. (a) The data represent the number of accidents from 2001 to 2005

| Year | No. of accidents ('000) |
|------|-------------------------|
| 2001 | 10 |
| 2002 | 17 |
| 2003 | 15 |
| 2004 | 10 |
| 2005 | 13 |

Draw a suitable diagram

- (b) The following data represent five students marks in Mathematics, Statistics, Computer Science and Physics:

Statistics = (90, 55, 40, 65, 90)

Mathematics = (85, 62, 54, 20, 47)

Computer_science = (90, 55, 70, 40, 80)

Physics=(20,50,70,90, 64)

Write a Python code to construct multiple bar diagram

20. (a) Explain types of correlation based on the correlation value

- (b) Explain looping techniques in Python with examples.

21. (a) Write MATLAB commands to evaluate the following mathematical expressions:

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

(ii) $y = 3 \frac{\cos 3x}{7}$

(iii) $y = 4x^{0.58} + \frac{1}{x^{0.72}}$

(iv) $r = \frac{1}{\frac{1}{a} + \frac{1}{b} + \frac{1}{c} + \frac{1}{d}}$

(v) $y = \sqrt{x^3 + 2x}$

- (b) Explain the method to change the plot colour, line styles, and data markers. (10 + 10)

22. (a) Explain inner join, outer join, left join and right join with suitable examples in Python.

- (b) Given a system $Ax = b$ where $A = \begin{bmatrix} 8 & 2 \\ 4 & 3 \end{bmatrix}$, $x = \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$, $b = \begin{bmatrix} 5 \\ 7 \end{bmatrix}$.

Write the MATLAB commands to compute the following (i) rank of A (ii) rank of [A, b]

- (iii) determinant of A (iv) inverse of A (v) find the solution for x_1 & x_2 . (10 + 10)

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