

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2023
(Second Semester)

Branch – MATHEMATICS

MAJOR ELECTIVE COURSE – I: MATLAB AND LATEX

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

1. Which command will give the standard deviation for the dataset X in MATLAB?
(i) `stdv(X)` (ii) `std(X)`
(iii) `sqrt(stdv(X))` (iv) `sqrt(std(X))`
2. Which command in MATLAB will create a plot of temperature versus time (i.e., time on the x -axis and temperature on the y -axis)?
(i) `plot(time, temperature)` (ii) `plot(temperature, time)`
(iii) `plot([time, temperature])` (iv) `plot([temperature, time])`
3. How can the formulation of polynomial be done from in MATLAB its roots?
(i) `poly(r)`, r is a row vector, containing the roots of the polynomial
(ii) `poly([roots as a row vector])`
(iii) `poly([roots as a column vector])`
(iv) `poly([roots in descending order as a column vector])`
4. Which command is used to comment out a line of text in LaTeX?
(i) `@` (ii) `#`
(iii) `$` (iv) `%`
5. What is the command in LaTeX to create fractions 'a/b'?
(i) `\frac{a}{b}` (ii) `\frac{a/b}`
(iii) `\fraction{a}{b}` (iv) `\fraction{a/b}`

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

6. (a). Write down the MATLAB code to generate a random array X of the size 100×1 and also to find the minimum, maximum, mean, variance and standard deviation of the vector X .
(OR)
(b). Explain about creating arrays in MATLAB.
7. (a). Write down the MATLAB code to draw a circle with radius 1.5 units and centre at (1, 1).
(OR)
(b). Write short notes on user defined function.
8. (a). Explain about polynomials in MATLAB.
(OR)
(b). Write down the MATLAB code to find the partial derivative with respect to y for the function $(x, y) = 2x^2 + 3y^3 - 10$.

Cont...

9. (a). Differentiate the inclusion procedure of normal texts and mathematical symbols in LaTeX document with the proper syntax.

(OR)

- (b). Write down the code for constructing the equation Arrays in LaTeX software.

10. (a). Write down the LaTeX commands for including a mathematical function with 3 cases.

(OR)

- (b). Explain the LaTeX commands for framing the slide-wise title in beamer presentation.

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

11. (a). List out all operations on matrices in MATLAB software and explain the same operations with the syntax.

(OR)

- (b). Discuss the MATLAB commands for finding the eigen values and eigen vectors for the given matrix.

12. (a). Explain in detail about the procedure for plotting 4 figures in the same MATLAB figure window.

(OR)

- (b). Differentiate the plotting commands 'plot' and 'plot3' with the suitable example. Also elaborate 3-dimensional plotting commands with syntax.

13. (a). Describe the construction of higher degree polynomials in MATLAB software and also discuss the code for solving the given polynomial.

(OR)

- (b). Elaborate the MATLAB program to perform the best fitting curve and interpolation techniques.

14. (a). Describe the general procedure for documenting an article in LaTeX software and also list out the basic LaTeX commands required for preparing the document.

(OR)

- (b). Discuss in detail about the different types of font sizes and styles in LaTeX with the proper syntax.

15. (a). Explain in detail the inclusion of tables and figures in LaTeX document.

(OR)

- (b). Elaborate the guidelines for preparing the beamer presentation along with the LaTeX codes.

Z-Z-Z

END