

Branch – MATHEMATICS WITH COMPUTER APPLICATIONS

CORE ELECTIVE – I MATLAB

Time : Three Hours

Maximum : 75 Marks

SECTION-A (20 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 x 2 = 20)

- 1 What is the purpose of command window?
- 2 Write the command to create a matrix $A = \begin{bmatrix} 7 & 4 & 9 \\ 3 & 8 & 1 \\ 6 & 5 & 3 \end{bmatrix}$.
- 3 What is the difference between the functions length (A) and size (A)?
- 4 What will be the output $b * A$ for $A = [2570 ; 10134 ; 62 115]$ and $b = 3$?
- 5 Explain fprintf command.
- 6 Write a command to create two – dimensional plots. Give an example.
- 7 Write the command to define the inline function $f(x) = \frac{e^{x^2}}{\sqrt{x^2 + 5}}$.
- 8 Write down the syntax to define feval command.
- 9 Explain all(A) and find (A) with an example.
- 10 Explain break command.

SECTION - B (25 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 5 = 25)

- 11 a Explain in detail about the functions sqrt(x), abs(x), round(x), floor(x), sign(x) with separate examples.
OR
b Create a 6 x 6 matrix in which the middle two rows and the middle two columns are 1's and the rest are 0's.
- 12 a Explain in detail array addressing with an example.
OR
b Use MATLAB to create the following three matrices.

$$A = \begin{bmatrix} 5 & 2 & 4 \\ 1 & 7 & -3 \\ 6 & -10 & 0 \end{bmatrix} \quad B = \begin{bmatrix} 11 & 5 & -3 \\ 0 & -12 & 4 \\ 2 & 6 & 1 \end{bmatrix} \quad C = \begin{bmatrix} 7 & 14 & 1 \\ 10 & 3 & -2 \\ 8 & -5 & 9 \end{bmatrix}$$
 - i) Calculate $A + B$ and $B + A$
 - ii) $A + (B + C)$ and $(A + B) + C$
 - iii) $5(A + C)$ and $5A + 5C$.
- 13 a Explain plot of given data and plot of a function with an example.
OR
b Plot the function $y = 3x^3 - 26x + 10$ and its first, second derivatives for $-2 \leq x \leq 4$, all in the same plot.

Cont ...

- 14 a Explain in detail local and global variables.
OR
b Explain in detail save and load commands.
- 15 a Discuss in detail about the loops with an example.
OR
b Evaluate the following expressions without using MATLAB. Check the answer with MATLAB. $a = 10$, $b = 6$.
(i) $y = a \geq b$ (ii) $y = a - b \leq b/2$ (iii) $y = a - (b \leq b/2)$.

SECTION - C (30 Marks)

Answer any **THREE** Questions

ALL Questions Carry **EQUAL** Marks (3 x 10 = 30)

- 16 Discuss about MATLAB windows.
- 17 Explain detail about using arrays in MATLAB. Built-in math functions and analysing arrays.
- 18 Explain in detail formatting a plot.
- 19 Explain inline functions. Also write down the similarities and differences between script and function files.
- 20 Explain in detail about the relational and logical operators in MATLAB.

Z-Z-Z

END