Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Electrical Engg.) (Sem.–6)

NUMERICAL AND STATISTICAL METHODS

Subject Code : BTEE-505

M.Code : 72790

Date of Examination : 05-07-22

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Write briefly :

a) What are the applications of Newton-Raphson's method?

b) Find the eigen values of $A = \begin{bmatrix} 6 & 5 \\ 1 & 2 \end{bmatrix}$.

c) What is the relation between Δ and E?

d) Define the Average operator μ.

e) What do you mean by numerical integration?

f) What is Euler's iteration formula?

g) What do you mean by F – test?

h) Explain the term Null hypothesis with example.

i) A coin is tossed successively three times. Determine the probability of getting exactly 2 heads.

j) Find the mean of binomial distribution $B\left(4, \frac{1}{3}\right)$.

SECTION-B

2. Find the Eigen vectors for the matrix $A = \begin{bmatrix} 5 & 0 & 1 \\ 0 & -2 & 0 \\ 1 & 0 & 5 \end{bmatrix}$

3. Two samples of sodium vapour bulbs were tested for length of life and the following results were got :

	Size	Sample mean	Sample S.D.
Type I	8	1234 hours	36 hours
Type II	7	1036 hours	40 hours

Is the difference in the means significant to generalize that type I is superior to type II regarding length of life?

4. A pair of dice is thrown 7 times. If getting a total 7 is considered a success, what is the probability of (i) no success (ii) 6 successes (iii) at least 6 successes

5. Find the missing value of the following data:

x	0	1	2	3	4
y	1	3	9	?	17

6. Find a real root of the equation $x = e^{-x}$ by Newton Raphson method.

SECTION-C

7. Fit a polynomial of degree 3, which takes the following values:

x	3	4	5	6
y	6	24	60	120

8. Apply Runge - Kutta's method of order 4 to find y (0.2) in steps of 0.1 given that $\frac{dy}{dx} = 3x + 2y$ and $y(0) = 1$.

9. Solve the following linear system by using Gauss-Seidel iteration method.

$8x - 3y + 2z = 20, \quad 6x + 3y + 12z = 35, \quad 4x - 11y - z = 33.$

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.