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

Total No. of Questions : 09

B.Tech.(EEE) (Sem.–3)

MATHEMATICS III

Subject Code : BTAM-303-18

M.Code : 76448

Date of Examination: 02-01-2024

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. Explain briefly :

a) Find the Laplace transform of $2\sin 2t\cos 4t$.

b) State properties of multiple correlation.

c) Find the Laplace transform of the unit function.

d) Find fourier Sine transform of $e^{-ax.}$

e) Explain degree of freedom.

f) State convolution theorem on Fourier Transform.

g) State final value theorem.

h) State properties of Regression lines.

i) State conditions for Chi -square test.

j) State merits of normal distribution.

SECTION-B

2. Find the z transform of $c^k \cosh ak$, $k \geq 0$.

3. Find the Fourier transform of $f(x) = \begin{cases} 1 & for\ |x| < 1 \\ 0 & for\ |x| > 1 \end{cases}$

   Hence evaluate $\int_0^\infty \frac{\sin x}{x}\, dx$.

4. Evaluate $\int_0^t e^{-t}\left(\frac{\cos at - \cos bt}{t}\right) dt$

5. Two independent Samples of Sizes 9 and 8 give the Sum of squares of deviations from their respective means equal to 160 inch^2 and 91 inch^2 respectively. Can these be regarded as drawn from the same normal population?

6. Use the least square method to determine the equation of line of best fit for the data. Then plot the line.

X	8	2	11	6	5
Y	3	10	3	6	8

SECTION-C

7. Draw the graph of the periodic function $f(t) = \begin{cases} t & 0 < t < \pi \\ 0 & \pi < t < 2\pi \end{cases}$. And find its Laplace transform.

8. Solve the difference equation $6y_{k+2} - y_{k-1} - y_k = 0$, $y(0) = 0$, $y(1) = 1$ by Z- transform.

9. The following data due to Weldon shows the results of throwing 12 dice 4096 times, a throw of 4, 5 or 6 being called a success(x).

X	0	1	2	3	4	5	6	7	8	9	10	11	12	**Total**
f	-	7	60	198	430	731	948	847	536	257	71	11	-	**4096**

Fit a binomial distribution and calculate the expected frequencies. Compare the actual mean and Standard deviation with those of expected ones for the distribution.

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.