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

Total No. of Questions : 18

B.Tech.(ECE) (2018 Batch) (Sem.–3)

MATHEMATICS III

Subject Code : BTAM-303-18

M.Code : 76448

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

Write briefly :

1. Find Laplace of $(\cos t)\, u_1(t)$

2. Find L $(e^t t^2)$

3. Find a_n if $f(x) = x^3$, where $x \in (-2, 2)$.

4. Discuss behavior of Fourier series near a point of discontinuity of

$$f(x) = \begin{cases} 1, & -\pi < x < 0 \\ -1, & 0 \le x \le \pi \end{cases}.$$

5. Find $Z\{\sin(n+1)\theta\}$

6. Find relationship between Laplace and Fourier Transform.

7. Two cards are drawn one after the other from a well shuffled deck of 52 cards. Find the probability that both are spade, if the first card is not replaced.

8. If X is Poisson variate satisfies P (X = 1) = 0.5 P (X = 2), find mean and variance.

9. Define F-test

10. Discuss method to fit Parabola.

SECTION-B

11. State convolution theorem and find $L^{-1}\left(\frac{6s}{(s^2-16)^2}\right)$

12. Find the Fourier sine series of the function $f(x) = \sin 3x$, $0 \le x \le \pi$.

13. Solve difference equation $y_{n+2} - 2y_{n+1} + y_n = n$, $y_0 = 1$, $y_1 = 1$.

14. In a distribution, 12% of the item are under 30 and 85% are under 60. Find the mean and standard deviation of the distribution.

15. Two independent sample have 28 and 19 pair of observations with correlation co-efficient 0.55 and 0.75 respectively. Are these values consistent with the hypothesis that both the samples are drawn from the same population?

SECTION-C

16. Using Laplace transform to solve the initial value problem $u_{tt} = u_{xx}$, $0 < x < 1$, $t > 0$, subject to $u(x, 0) = 0$, $u_t(x, 0) = \sin 3\pi x$, $u(0, t) = \sin t$, $u(1, t) = 0$.

17. Using convolution $F^{-1}\left(\frac{1}{6+5i\omega-\omega^2}\right)$.

18. Find correlation coefficient of the following bivariate frequency distribution data :

	59-62	63-66	67-70	71-74	75-78
90-109	2	1			
110-129	7	8	4	2	
130-149	5	15	22	7	1
150-169	2	122	63	19	5
170-189		7	28	32	12
190-209		2	10	20	7
210-229			1	4	2

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.