

**MARRI LAXMAN REDDY****INSTITUTE OF TECHNOLOGY AND MANAGEMENT**

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

II B.Tech I Sem Supply End Examination, October 2021
PROBABILITY STATISTICS AND COMPLEX VARIABLES
(MECHANICAL)

Time: 3 Hours.**Max. Marks: 70**

Note: 1. Answer any FIVE questions.

2. Each question carries 14 marks and may have a, b as sub questions.

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|---|----|--|-----|-----|------|
| 1 | a) | Can two events be simultaneously independent and mutually exclusive? Explain. | 7M | CO1 | BL43 |
| | b) | Find the mean and variance of the distribution $f(x) = e^{-x}, x > 0$. | 7M | CO1 | BL |
| 2 | | In a bolt factory machines A, B, C manufacture 20%, 30% and 50% of the total of their output and 6%, 3% and 2% are defective. A bolt is drawn at random and found to be defective. Find the probabilities that it is manufactured from
(i) Machine A (ii) Machine B | 14M | CO1 | BL3 |
| 3 | a) | Prove that Poisson distribution is the limiting case of Binomial distribution. | 7M | CO2 | BL3 |
| | b) | Find the probability of 5 or more telephone calls arriving in a 9-minute period in a college switchboard, if the telephone calls that are received at the rate of 2 every 3 minutes following Poisson distribution. | 7M | CO2 | BL3 |
| 4 | | In 1950 in India the mean life expectancy was 50 years. If the life expectancies from a random sample of 11 persons are 58.2, 56.6, 54.2, 50.4, 44.2, 61.9, 57.5, 53.4, 49.7, 55.4, 57.0. Does it confirm the expected view? | 14M | CO3 | BL5 |
| 5 | a) | The marks obtained in Statistics by 1000 students are normally distributed with mean 78% and standard deviation 11%. Determine how many students got marks above 90%? | 7M | CO2 | BL3 |
| | b) | A briefcase manufacturing company claims that 80% of executives carried briefcases produced by them. Verify its claims if in a random sample of 900 executives, 675 used the company's briefcases. Use 5% level of significance. | 7M | CO3 | BL3 |
| 6 | | If $u = e^x[(x^2 - y^2) \cos y - 2xy \sin y]$ is a real part of an analytic function. Find the analytic function. | 14M | CO4 | BL5 |
| 7 | a) | State the Cauchy-Riemann (C-R) equation in Cartesian form. | 7M | CO4 | BL3 |
| | b) | Show that every bilinear transformation maps the circles in the z -plane onto the circles in the w -plane. | 7M | CO5 | BL3 |
| 8 | | State Cauchy integral formula. Evaluate Using Cauchy integral
$\int_C \frac{z+1}{z^2+2z+4} dz$ where C is $ z+1+i =3$. | 14M | CO5 | BL3 |