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Course Code: 1930512

Roll No:

MLRS- R19



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
COMPUTER ORIENTED STATISTICAL METHODS
(CSE & IT)

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.

- 1 a) The probability that a regularly scheduled flight departs on time is 0.83; the probability that it arrives on time is 0.82; and the probability that it departs and arrives on time is 0.78. Find the probability that a plane (a) arrives on time given that it departed on time, and (b) departed on time given that it has arrived on time. 7M CO1 U
- b) Suppose that we have a fuse box containing 20 fuses, of which 5 are defective. If 2 fuses are selected at random and removed from the box in succession without replacing the first, what is the probability that both fuses are defective? 7M CO1 U
- 2 a) A random variable X has the following probability distribution. 7M CO1 U
X : 0 1 2 3 4 5 6
P(X) : k 3k 5k 7k 9k 11k 13k
Find the value of k, also find $P(X < 4)$, $P(X \geq 5)$ and $P(3 < X \leq 6)$.
- b) In a bolt factory machines A, B, and C manufacture respectively 25%, 35%, and 40% respectively. Of their output 5, 4, 2 percent are defective bolts. A bolt is drawn at random from the product and is found to be defective. What are the probabilities that it was manufactured by machines A, B, and C? 7M CO1 AP
- 3 a) Fit a Poisson distribution to the following data. 7M CO2 AP
- | | | | | | |
|---|-----|-----|-----|----|----|
| X | 0 | 1 | 2 | 3 | 4 |
| f | 419 | 352 | 154 | 56 | 19 |
- b) Ten coins are thrown simultaneously, find the probability of getting at least seven heads. 7M CO2 U
- 4 a) If X is normal variate with mean 30 and standard deviation 5. Then find probability that i) $26 \leq X \leq 40$ ii) $X \geq 45$ iii) $|X - 30| > 5$. 7M CO2 AP
- b) Explain briefly about the significance of, F-Distribution 7M CO2 U
- 5 a) State and prove Chebyshev's theorem 7M CO2 U
- b) Derive Normal distribution as a limiting case of Binomial Distribution 7M CO2 AN

- 6 a) The Mean and Standard of a population are 11,795 and 14,054 respectively. If $n=50$, find 95% confidence interval for the Mean. 7M CO3 AN
- b) The heights of 10 males of a given locality are found to be 70,67,62,68,61,68,70.64,64,66 inches. Is it reasonable to believe that the average height is greater than 64 inches? 7M CO3 AN
- 7 a) In large consignment of oranges, a random sample of 64 oranges revealed that 14 oranges were bad. Is it reasonable to ensure that 20% of the oranges are bad? 7M CO3 AN
- b) Explain briefly about first order and higher order Markov process? 7M CO1 R
- 8 a) Explain the terms (i) Stochastic process (ii) Markov process (iii) Matrix of Transition probability 7M CO1 R
- b) Prove that the following TPM is Stochastic and Regular 7M CO3 AN

$$\begin{bmatrix} 0 & 0 & 1 \\ 1/2 & 0 & 1/2 \\ 0 & 1 & 0 \end{bmatrix}$$

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