

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, NOVEMBER-2018****Subject: Probability and Statistics****Branch: CSE****Time: 3 hours****Max. Marks: 75****Answer any FIVE Questions of the following****5x15M=75M**

1. a) State and prove addition Theorem of Probability. [5M]
 b) There are boxes I, II, III. Box I contains 4 red, 5 blue, 6 white balls. Box II contains 3 red, 4 blue and 5 white balls. Box III contains 5 red, 10 blue and 5 white balls. One box is chosen and one ball is drawn from it. What is the probability that i) Red ball is drawn ii) blue ball is drawn from the I box. [10M]

2. a) Let X denote the number of heads in a single loss of 4 fair coins. Determine
 i) $P(X < 2)$ ii) $P(1 < x \leq 3)$ from the following

X	0	1	2	3	4
P(X=x)	1/16	1/16	1/16	1/16	1/16

- b) In a normal distribution 7% of the items are under 35 and 89% are under 63. Find the mean and standard deviation of the distribution.

3. a) The mean height of students in a college is 155 cm and standard deviation is 15. What is the probability that the mean height of 36 students is less than 157 cm. [10M]
 b) A random sample of size 100 is taken from a population with standard deviation 5.1. Given that the sample mean is 21.6. Calculate a 95% confidence interval for the population mean. [5M]

4. a) A Sample of 64 students has a mean weight of 70 kgs. Can this be regarded as a sample from a population with mean weight 65 kgs and standard deviation 25 kgs?
 b) Among 900 people in a state 90 are found to be chapatti eaters. Construct 99% confidence interval for the true proportion.

5. By the method Last square a parabola of the form $y = a + bx + cx^2$ for the following data

X:	2	4	6	8	10
Y:	3.07	12.85	31.47	57.38	91.259

6. a) Find the coefficient of correlation for the following data.

X :	1	2	3	4	5
Y :	8	6	4	7	9

[7M]

- b) In a partially destroyed laboratory record, only the lines of regression of y on x and x on y are available as $4x - 5y + 33 = 0$ and $20x - 9y = 107$ respectively. Calculate \bar{x} , \bar{y} and the coefficient correlation between x and y. [8M]

7. A T.V. Repairman finds that the time spent on his jobs has an exponential distribution with mean 30 minutes. If he repairs sets in the order in which they came in, and if the arrival of sets is approximately Poisson with an average of 10 per 8-hour day, what is the repairman's expected idle time each day? How many jobs are ahead of the average set just brought in? [15M]
8. a) Test whether the following Markov chain is ergodic and regular

		To		
		E1	E2	E3
From	E1	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{2}$
	E2	$\frac{1}{4}$	$\frac{3}{4}$	0
	E3	$\frac{1}{2}$	0	$\frac{1}{2}$

- b) Find the unique fixed probability vector of the

$$\begin{pmatrix} \frac{1}{2} & \frac{1}{4} & \frac{1}{4} \\ \frac{1}{2} & 0 & \frac{1}{2} \\ 0 & 1 & 0 \end{pmatrix}$$