

**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Gundlupochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad.

**II B.Tech II Semester Supplementary Examinations, NOVEMBER-2017****SUBJECT: Probability and Statistics**

Branch: Common to CE &amp; IT

**Time: 3 hours****Max. Marks: 75 Mark****Answer Any 5 Questions****5x15 Marks= 75 Marks**

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.

2. a) A Random variable X has the following probability distribution. [7 M]

X	0	1	2	3	4	5	6	7	8
P(X)	a	3a	5a	7a	9a	11a	13a	15a	17a

- i) Determine the value of a. ii) Find  $P(x < 3)$ ,  $P(x > 3)$  and  $P(0 < x < 5)$  iii) Find the distribution F(x). b) Out of 800 families with 5 each children each, how many would you expect to have i) 3 boys ii) 5 girls iii) either 2 or 3 boys iv) atleast one boy? Assume equal probabilities for boys and girls. [8M]
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. Fit a second degree parabola to the following data: [15M]

X	0	1	2	3	4
Y	1	1.8	1.3	2.5	6.3

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 post office has two counters, which handles the business of money orders, registration letters etc. It has been found that the service time distributions for both the counters are exponential with mean service time of 4 minutes per customer. The customers are found to come in each counter in a poisson fashion with mean arrival rate of 11 per hour. Calculate i) Probability of having to wait for service of

8. a customer ii) Average waiting time in the queue iii) Expected number of idle counters. Define stochastic process and Markov chains with examples. Give the classifications of Markov chains and states. [15 M]