Code No: 53014 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year I Semester Examinations, November - 2015

PROBABILITY AND STATISTICS

(Common to ME, CSE, AME, MIE, MSNT)

Time: 3 hours **Max. Marks: 75**

Answer any five questions

All questions carry equal marks

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1.a) A box I contains 3 red balls,2 black and 1 white balls. Box II contains 1 red, 1 black and balls 3 white balls, Box III contains 3 red, 3 black and balls 3 white balls. A box is chosen at random and a ball is drawn what is the probability that it is from

i) Box 1 ii) Box II iii) Box III.

b) A random sample with replacement of size 2 taken from S = {1, 2, 3}. Let the random variable X denote the sum of the two numbers:

i) Write the probability distribution of X

ii) The mean

iii) The variance. [8+7]

2.a) Ten coins are thrown simultaneously. Find the probability of getting:

i) At least 1 head

ii) At least seven heads

iii) Only 2 times.

b) A sample of 121 students is found to have a mean weight of 68 kgs. Can this be regarded as a sample from a population with mean weight 75 kgs. and standard deviation 31 kgs. [8+7]

3.a) A Random sample of 300 items is taken from a population whose standard deviation is 18 The mean of the sample is 82.construct 95% confidence interval for the mean.

b) A random sample of size 225 is taken whose mean is 80. Can this be regarded as a sample from population with mean 82 and standard deviation15. [8+7]

4.a) Among 900 people in a state 90 are found to be chapati eaters. Construct 99% confidence interval for the proportion.

b) In a sample of 1000 students 500 use ball pen and in another sample of 3500 students 1400 use ball pens. Test the significance between the difference of two proportions at 5% level. [7+8]

5. Given below is the number of male births in1000 families with 5 children each. Is this result with the hypothesis that male births are equally probable? [15]

No. of boys	0	1	2	3	4	5
No. of families	40	300	250	200	30	180

6. Calculate the coefficient of correlation and the two lines of regression between the two variables x and y. [15]

x	10	12	18	24	23	27
y	13	18	12	25	30	10

7. The milk plant at a city distributes its products by trucks, loaded at the loading dock. It was its own fleet of trucks plus trucks of a private transport company. The trucks arrive at the interval of 20 minutes. The service time is 4 minutes.
a) Average number of trucks in the queue
b)The probability that there are more than or equal to 4 trucks in the queue
c) The waiting time of a truck in the queue.
d) The variance of queue length. [15]

8. A Professor has three pet questions, one of which occurs on every test he gives. He never uses the same question twice in successive examinations. If he used the question no 1, he tosses a coin and uses the question no. 2. If he uses the question no. 2, he tosses two coins and use the question no 3, if both are heads. If he uses the question no 3, he tosses three coins and use the question no 1, if all are heads. In long run which question does he use most often and with how much frequency is it used. [15]

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