R09

Code No: 54001

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, December - 2018
PROBABILITY AND STATISTICS
(Common to CE, CHEM, IT, PTM)

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

Answer any five questions
All questions carry equal marks
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1.a) There are 12 items of which 5 are defective. If three are selected find the probability that: i) one is defective ii) None is defective.
b) State and prove Baye's theorem. [8+7]

2.a) Prove that Poisson distribution is limiting case of Binomial distribution.
b) Samples of size 2 are taken from the population 3, 6, 9, 15, 27 with replacement. Find:
i) mean of the sampling distribution of means and
ii) standard deviation of the sampling distribution of means. [7+8]

3.a) In how many ways the estimation can be done? What are they? Explain in detail.
b) A sample of 64 students have a mean weight 70 kgs. Can this be regarded as a sample from a population with mean weight 56 kgs and standard deviation 25 kgs? [7+8]

4.a) In a big city 325 men out of 600 men were found to be smokers. Does this information support the conclusion that the majority of men in this city are smokers.
b) In a city A, 20% of a random sample of 900 school boys has a certain slight physical defect. In another city B, 18.5% of a random sample of 1600 school boys has the same defect. Is this difference between the populations significant at 5% level of significance? [7+8]

5.a) A random sample of 7 students had the following I.Q's:
85, 96, 105, 102, 82, 89, 90.
Does this data support the claim of a population mean of I.Q 100? Test at 5% level of significance.
b) Two random samples of sizes 9 and 7 gave the sum of squares of deviations from their respective means as 175 and 95 respectively. Can they be regarded as drawn from normal populations with the same variance? [8+7]

6.a) The regression lines equations are $x+0.4y-6.4=0$ and $0.6x+y-4.6=0$. Find mean values of x, y are correlation coefficient.
b) Compute the rank correlation coefficient for the following data. [7+8]

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

7. A fast food restaurant has one drive-in window. It is estimated that cars arrive according to a Poisson distribution at the rate of 2 for every 5 minutes and that there is enough space to accommodate a line of 10 cars. Other arriving cars can wait outside this space, if necessary. It takes 5 minutes on the average to attend an order, but the service time actually varies according to exponential distribution. Determine:
a) the probability that the facility is idle
b) the expected number of customers waiting to be served
c) the effective arrival rate and
d) the time expects to spend in the system. [15]

8. Three boys A, B and C are throwing a ball to each other, A always throws the ball to B and B always throws the ball to C, but C is just as likely to throw the ball to B as to A. Show that the process is Markovian. Find the transition matrix and classify the states. [15]

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