

**R09**

Code No: F3104

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****MCA I Semester Examinations, January - 2020****PROBABILITY AND STATISTICS**

Time: 3hrs

Max.Marks:60

**Answer any five questions**  
**All questions carry equal marks**

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- 1.a) There are 25 cards numbered 1 to 25. Two cards are drawn. Find the probability that their sums is i) even ii) a multiple of 3.
- b) There are three boxes. I contains- 10 light bulbs out of which 4 are defective II, contains- 6 light bulbs out of which 1 is defective, III contains- 8 light bulbs out of which 3 are defective. A box is chosen at random and a bulb is selected. If it is defective then find the probability that it is from:
- i) Box- I ii) Box-II iii) Box-III. [6+6]

- 2.a) A random variable X has the following distribution

|          |               |               |               |                |                |
|----------|---------------|---------------|---------------|----------------|----------------|
| x        | 1             | 2             | 3             | 4              | 5              |
| P(X = x) | $\frac{1}{2}$ | $\frac{1}{4}$ | $\frac{1}{8}$ | $\frac{1}{16}$ | $\frac{1}{16}$ |

- Find: i) The mean ii) variance. iii)  $P(1 < X < 4)$
- b) The probability of man hitting a target is  $\frac{1}{3}$ . If he fires 6 times, find the probability of hitting: i) At the most 5 times ii) At least 5 times iii) Exactly once. [6+6]
- 3.a) Average number of accidents on any day on a national highway is 1.6. Determine the probability that the number of accidents is i) at least one ii) at the most one
- b) The marks obtained by 1000 students is normally distributed with mean 78 % and Standard deviation 11%. Determine
- i) How many get more than 90%.
- ii) How many students get between 75% and 90%. [6+6]
4. A population consists of five numbers 5,10,15,20 .Consider all Samples of size two which can be taken with replacement from this population. Find:
- a) The population mean.
- b) The population Standard deviation.
- c) The mean of the sampling distribution of means.
- d) Standard deviation of the sampling distribution of means. [12]
- 5.a) A Random sample of 100 items is taken from a population whose standard deviation is 5.1 The mean of the sample is 21.6. Construct 95% confidence interval for the mean.
- 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? [6+6]

- 6.a) A simple sample of heights of 6400 Englishmen has a mean of 67.85 and Standard deviation of 2.56 inches. While a simple sample of heights of 1600 Australian has a mean of 68.55 and a S.D. of 2.52 inches Test the significance between the two mean.
- b) 400 articles from a factory are examined and 3% are found to be defective. 600 similar articles from a second factory are found to be 2 % defective. Test the significance between the differences of two proportions at 5% level. [6+6]

7. Two random sample are drawn from two normal populations are as follows.

|           |    |    |    |    |    |    |    |    |
|-----------|----|----|----|----|----|----|----|----|
| Sample I  | 17 | 27 | 18 | 25 | 27 | 29 | 13 | 17 |
| Sample II | 16 | 16 | 20 | 27 | 26 | 25 | 21 |    |

Test whether two populations have been drawn from the same normal population. [12]

8. The marks obtained by 10 students in Mathematics and Statistics are given below. Find the Coefficient of correlation between the two subjects and the regression lines. [12]

|                     |    |    |    |    |    |    |    |    |    |    |
|---------------------|----|----|----|----|----|----|----|----|----|----|
| Marks in Maths      | 75 | 30 | 60 | 80 | 53 | 35 | 15 | 40 | 38 | 48 |
| Marks in Statistics | 85 | 45 | 54 | 91 | 38 | 63 | 35 | 43 | 45 | 44 |

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