Code No: 153AJ **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year I Semester Examinations, August/September – 2022
COMPUTER ORIENTED STATISTICAL METHODS
(Common to CSE, IT, CSE(SE), CSE(IOT), CSE(N))

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

Answer any five questions
All questions carry equal marks
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1.a) Three machines I, II and III produce 40%,30% and 30% of the total number of items of a factory. The percentages of defective items of these machines are 4%, 2% and 3%. An item is selected at random and found to be defective. Find the probability that it is from
i) Machine- I ii) Machine-II iii) Machine-III

b) A continuous Random variable has the p.d.f $f(x)=\begin{cases} e^{-x} & If\ x\geq 0 \\ 0 & otherwise \end{cases}$
Determine: i) P(0 ≤ x ≤ 2) ii) The mean iii) Variance. [8+7]

2.a) 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 find the probability that it is from:
i) Box- I ii) Box-II iii) Box-III

b) A continuous Random variable has the p.d.f $f(x)=\begin{cases} \frac{1}{2}(x+1) & -1\leq x\leq 1 \\ 0 & otherwise \end{cases}$. Determine:
i) P(2 ≤ x ≤ 4) ii) The mean iii) Variance. [8+7]

3.a) Six cards are drawn from a pack of 52 cards. Getting a red card is a success. Find the probability of getting the success:
i) At least once ii) 3 times
b) The probabilities of a Poisson variate taking the values 1 and 2 are equal. Find:
i)μ ii) P(x≥1) [8+7]

4.a) Assume that 60% of the students passed an examination. Find the probability that among 12.
i) Exactly 8 ii) At least 4 pass the examination
b) If the variance of a Poisson variate is 3. Find the probability that:
i) P(x=0) ii) P(1≤x<4). [8+7]

5.a) In a test on electrical bulbs, it was found that the life of a particular make was normally distributed with an average life of 2040 hours and S.D of 40 hrs. Estimate the number of bulbs likely to burn formore than 2140.

b) Two horses A, B were tested according to the time (in seconds) to run a particular track with the following results.

Horse A	28	30	32	33	33	29	34
Horse B	29	30	30	24	27	29	-

Test whether the two horses have the same running capacity at 95 % level. [8+7]

6.a) If the masses of 300 students are normally distributed with mean 68 kgs and standard deviation 3kgs. How many students have masses?
i) Greater than 72 kgs ii) Between 65 and 71 kgs

b) The following table gives the number of train accidents in a country that occurred during the various days of the week. Find whether the accidents are uniformly distributed over the week. Test at the level of 0.05. [7+8]

Days	Sun	Mon	Tues	Wed	Thurs	Fri	Satur
No. of accidents	20	18	13	23	26	11	15

7.a) A sample of 900 members has a mean 3.4 cms and S.D 2.61 cms. Is this sample has been taken from a large population of mean 3.25 and S.D 2.61.

b) In a city A 20% of a random sample of 900 school boys had a certain slight physical defect. In another city B 18.5% of a random sample of 1600 school boys had the same defect. Is the difference between the proportions is significant at 0.05 level of significance. [7+8]

8. The school of international studies for population found out by its survey that the mobility of the population of a state to village, town and city is in the followingpercentage.

		To		
		Village	town	city
From	Village	30%	20%	50%
	Town	30%	50%	20%
	City	10%	40%	50%

What will be the proportion of population in village, town and city after two years? Present population has proportion of 0.4, 0.3 and 0.3 village, town and city respectively. Find the proportions in the long run. [15]

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