

R18

Code No: 153AJ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year I Semester Examinations, March - 2021

COMPUTER ORIENTED STATISTICAL METHODS

(Common to CSE, IT)

Max. Marks: 75

Time: 3 hours

Answer any five questions
All questions carry equal marks

1. Two dice are thrown the random variable is assigned to the sum. Write the distribution. Find the mean and variance. [15]
- 2.a) If the probability distribution function of a continuous random variable is ke^{kx} , $-\alpha \leq x \leq \alpha$. Find i) k ii) mean iii) variance.
- b) A sample of 4 items is selected from 12 out of which 5 are defective. Find the expected number of defective items. [8+7]
- 3.a) Eight coins are tossed. Find the probability of getting heads: i) $p(x=3)$ ii) $p(x \leq 4)$.
- b) The probabilities of a Poisson variate taking the values 1 and 2 are equal. Calculate: i) $p(x=0)$ ii) $p(x=3)$ [7+8]
- 4.a) Mean heights of students is 159cms with a standard deviation of 20. Find how many students heights lie between 150cms and 170cms in a class of 100 students.
- b) The expected number of typographical errors on a page of a certain magazine is 0.2. What is the probability that the next page you read contains i) 0 and ii) 2 or more typographical errors? [7+8]
5. From the following data find whether there is any significant liking in the habit of taking soft drinks among the categories of employees. [15]

Soft drinks	Employees		
	Clerks	Teachers	Officers
Pepsi	10	25	65
Thumsup	15	30	65
Maaza	50	60	30

6. Two horses A and B were tested according to the time (in seconds) to run a particular track with the following results. Test whether two horses have the same running capacity. [15]

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

- 7.a) A random sample of 100 electric bulbs, produced by a manufacturer A showed a mean life of 1190 hrs with a standard deviation of 90. Another sample of 75 electric bulbs produced by a manufacturer B showed a mean life of 1230 with a standard deviation of 120 hrs. Find whether there is significant difference between the mean.
- b) 50 people were attacked by a disease and 30 were survived. If the survival rate is 70%, test the chain at 5% level. [8+7]

8. Consider a three-state Markov chain with the transition matrix. If the initial probabilities $P_0 = (0.2, 0.3, 0.5)$.

$$P = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 2/3 & 1/3 \\ 1/16 & 15/16 & 0 \end{bmatrix}$$

- a) Find the probabilities after two transitions.
- b) Find the limiting probabilities. [8+7]

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