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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year I Semester Examinations, March - 2022
COMPUTER ORIENTED STATISTICAL METHODS
(Common to CSE, IT, CSE(SE), CSE(IOT), CSEN)

Time: 3 Hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks

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1.a) In a certain college 25% of boys and 10% of girls are studying Mathematics. The girls constitute 60% of the students. If a student is selected and is found to be studying Mathematics, find the probability that the student is a:
   i) Girl   ii) boy

   b) If f(x)=K$e^{-|x|}$ is p. d.f in $-\infty \leq x \leq \infty$, find:
   i) K   ii) the mean   iii) Variance.   [6+9]

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 $f(x) = \begin{cases} Kxe^{-\lambda x} & If\ x \geq 0, \lambda \geq 0 \\ 0 & otherwise \end{cases}$. Determine
   i) K   ii) The mean   iii) variance.   [6+9]

3.a) The probability of man hitting a target is 1/3. If he fires 6 times, find the probability of hitting:
   i) At the most 5 times   ii) At least 5 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 50% of the Engineers are good in Mathematics. Find the probability that among 9:
   i) Exactly 5   ii) At least 6

   b) If x is a Poisson variate such that 3P(x=4)=1/2P(x=2)+P(x=0). Find:
   i)μ   ii) P(x≤2).   [7+8]

5.a) Write the properties of normal distribution.
   b) Find the mean and variance of gamma distribution.   [7+8]

6.a) The weekly wages of 1000 workers are normally distributed with mean Rs. 70 and a standard deviation of Rs. 5. If x is the weekly wages. Find:
   i) P(68< x < 72)   ii) P(60 < x < 75)

   b) A random sample from a company's very extensive files shows that orders for a certain piece of machinery were filled, respectively in 10,12,19,14,15,18,11 and 13 days. Test the claim that on the average such orders are filled in 10.5 days. Test at 0.01 level. [7+8]

7.a) A candidate for election made a speech in a city. Among 500 voters from city A 59.6% are in favour of him where as among 300 voters from city B 50% are in favour of him. Test the significance between the differences of two proportions at 5% level.

b) A random sample of size 500 was taken whose S.D is 6 and the mean is 40 Construct 95% confidence interval for the mean. [8+7]

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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