



ACE
Engineering College
(with a Difference in Excellence)

An AUTONOMOUS Institution

ACE-R20

Question Paper Code:

MA303BS

Semester Supplementary Examination
II B. Tech- I Semester- SEPTEMBER-2022
COMPUTER ORIENTED STATISTICAL METHODS
(Common to CSE,IT and CSO)

Time: 3 Hours

Max. Marks: 70

H. T. No

Answer any 5 Questions out of 8 Questions from the following

MQ.No	Question	Marks
1. a)	A, B, C are aiming to shoot a balloon. A will succeed 4 times out of 5 attempts. The chance of B to shoot the balloon is 3 out of 4 and that of C is 2 out of 3. If three aim the balloon simultaneously, then find the probability that atleast two of them hit the balloon.	7
b)	In a bolt factory, machines A, B and C manufacture 20%, 30% and 50% of the total of their output and 6%, 3% and 2% are defective. A bolt is drawn at random and found to be defective. Find the probability that it is manufactured from Machine C.	7
2. a)	The probability that a man hitting a target is $1/3$. If he fires 6 times, find the probability that he fires (i) At the most 5 times, (ii) Exactly once and (iii) Atleast two times.	7
b)	2% of the items of a factory are defective. The items are packed in boxes. What is the probability that there will be (i) 2 defective items (ii) At least three defective items in a box of 100 items	7
3. a)	Suppose the weights of 800 male students are normally distributed with mean 140 pounds and standard deviation 10 pounds. Find the number of students whose weights are between 138 and 148 pounds.	7
b)	A normal population has a mean of 0.1 and standard deviation of 2.1. Find the probability that mean of a sample of size 900 will be negative.	7
4. a)	A random variable X is defined as sum of the numbers on the faces when two dice are thrown. Find the mean of X.	7
b)	In a certain town 40% have brown hair, 25% have brown eyes and 15% have both brown hair and brown eyes. A person is selected at random from the town. (i) If he has brown hair, what is the probability that he has brown eyes also? (ii) If he has brown eyes, determine the probability that he does not have brown hair?	7
5.	A population consists of five numbers 2, 3, 6, 8 and 11. Compute all possible samples of size two which can be drawn with replacement from this population. Find (i) The mean of the population (ii) The standard deviation of the population (iii) The mean of sampling distribution of means and (iv) The standard deviation of sampling distribution of means.	14
6. a)	A random sample of 400 items is found to have mean 82 and standard deviation 18. Find the maximum error of estimation at 95% confidence interval. Find the confidence limits for the mean.	7

b)	An ambulance service claims that it takes on the average less than 10 minutes to reach its destination in emergency calls. A sample of 36 calls has a mean of 11 minutes and the variance of 16 minutes. Test the claim at 0.05 level of significance.	7
7.	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.	14
8. a)	If the transition probability matrix market shares of three brands A, B and C is $\begin{bmatrix} 0.4 & 0.3 & 0.3 \\ 0.8 & 0.1 & 0.1 \\ 0.35 & 0.25 & 0.4 \end{bmatrix}$ and the initial market share are 50%, 25% and 25%. Find the market share in second and third periods.	7
b)	A sample of 26 bulbs gives a mean life of 990 hours with a S.D. of 20 hours. The manufacturer claims that the mean life of bulbs is 1000 hours. Test whether the sample is upto the standard or not?	7