



20BS4101A

UNIT-IV

8. a. Explain the importance of Quality control? (CO4 K2) 7M
b. Explain the procedure for mean and range charts. (CO4 K2) 8M

(or)

9. a. Define reliability? Explain the importance of Hazard function in the computation of failure rate. (CO4 K2) 7M
b. A system consists of 5 identical components connected in parallel. Find the reliability of each component if the overall reliability of the system is to be 0.96? (CO4 K2) 8M

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Reg. No:

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SIDDHARTHA ENGINEERING COLLEGE

(AUTONOMOUS)

II/IV B.Tech. DEGREE EXAMINATION, JUNE - 2024

Fourth Semester

COMPUTER SCIENCE AND ENGINEERING

20BS4101A PROBABILITY AND STATISTICS

Time: 3 hours

Max. Marks: 70

Part-A is compulsory

Answer One Question from each Unit of Part - B

Answer to any single question or its part shall be written at one place only

PART-A

10 x 1 = 10M

1. a. Define mathematical expectation. (CO1 K1)
b. Define Poisson distribution. (CO1 K1)
c. Write mean and variance of Normal distribution. (CO1 K2)
d. Define the term population. (CO2 K1)
e. Define Level of significance. (CO2 K1)
f. Define OC curve. (CO2 K1)
g. Write the test statistic for single sample proportion in large samples. (CO3 K2)
h. Write the test statistic for testing goodness of fit. (CO3 K2)
i. Write the control limits for mean chart (CO4 K2)
j. Define MTBF. (CO4 K1)

**20BS4101A****PART-B****4 x 15 = 60M****UNIT-I**

2. a. A random variable X has the following probability function

$X = x$	0	1	2	3	4	5	6	7
$P(X = x)$	0	k	$2k$	$2k$	$3k$	k^2	$2k^2$	$7k^2 + k$

Find: (i) k (ii) $P(X < 6)$ (iii) $P(0 < X < 5)$. **(CO1 K2) 7M**

- b. For the continuous random variable X whose Probability density

function is given by $f(x) = \begin{cases} kx^2 e^{-x} & \text{when } x \geq 0 \\ 0 & \text{otherwise} \end{cases}$

Find (i) k (ii) Mean (iii) Variance. **(CO1 K3) 8M**

(or)

3. a. 20% of the items produced from a factory are defective. Find the probability that in a sample of 5 chosen at random (i) none is defective (ii) one is defective (iii) $P(1 < x < 4)$. **(CO1 K3) 7M**
- b. 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 (i) between 138 and 148 pounds (ii) more than 152 pounds. **(CO1 K3) 8M**

UNIT-II

4. a. Explain the following terms (i) point estimation (ii) interval estimation. **(CO2 K2) 7M**

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4. b. It is claimed that a random sample of 49 tyres has a mean life of 15200 k.m. This sample was drawn from a population whose mean is 15150 kms and a standard deviation of 1200 kms. Test the significance at 0.05 level. **(CO2 K4) 8M**

(or)

5. a. Explain the procedure for testing of hypothesis. **(CO2 K2) 7M**
- b. The average marks scored by 32 boys is 72 with a S.D of 8. While that for 36 girls is 70 with a s.d of 6. Does this indicate that the boys perform better than girls at level of significance 0.05? **(CO2 K4) 8M**

UNIT-III

6. a. Explain the procedure for testing two variances. **(CO3 K2) 7M**
- b. Among the items produced by a factory out of 500, 15 were defective, in another sample out of 400, 20 were defective. Test the significance the difference of two proportions at 5% level. **(CO3 K4) 8M**

(or)

7. a. 20 people were attacked by a disease and only 18 survived. Will you reject the hypothesis that the survival rate if attacked by this disease is 85% in favour of the hypothesis that is more at 5% level **(CO3 K4) 7M**
- b. Fit a Poisson distribution for the following data and for its goodness of fit at level of significance 0.05? **(CO3 K4) 8M**

x	0	1	2	3	4
$f(x)$	419	352	154	56	19