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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations July-2022

PROBABILITY & STATISTICS

(Common to CE, EEE, ME, CSE, AGE & CSIT)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- 1 a State and prove Baye's theorem . L1 6M
 b Two cards are selected at random from 10 cards numbered 1 to 10. Find the probability that the sum is even if (i) The two cards are drawn together. (ii) The two cards drawn one after other with replacement. L2 6M

OR

- 2 a A businessman goes to hotels X, Y, Z, 20%, 50%, 30% of the time respectively. It is known that 5%, 4%, 8% of the rooms in X, Y, Z hotels have faulty plumbings. What is the probability that businessman's room having faulty plumbing is assigned to hotel Z? L1 6M
 b If X is a continuous random variable and k is a constant, then prove that L3 6M
 $Var(X + k) = Var(X)$ (β) $Var(kX) = k^2 Var(X)$

UNIT-II

- 3 a Find the mean and variance of a Normal distribution in which 7% of items are under 35 and 89% are under 63 L2 6M
 b Out of 800 families with 5 children each, how many would you expect to have (a) 3 boys (b) 5 girls (c) either 2 or 3 boys. Assume equal probabilities for boys and girls. L3 6M

OR

- 4 a Fit a Binomial distribution to the following frequency distribution: L4 8M
- | | | | | | | |
|---|----|----|----|----|----|----|
| x | 0 | 1 | 2 | 3 | 4 | 5 |
| f | 13 | 25 | 52 | 58 | 32 | 16 |
- b Two dice are thrown five times. Find the probability of getting 7 as sum i) at least once (ii) $p(1 < x < 5)$ L2 4M

UNIT-III

- 5 a In a big city 325 men out of 600 men were found to be smokers. Does this information support the conclusion that majority of men in this city are smokers? L4 6M
 b The means of two large samples of sizes 1000 and 2000 members are 67.5 inches and 68.0 inches respectively. Can the samples be regarded as drawn from the same population of S.D 2.5 inches L5 6M

OR

- 6 a A Sample of 64 students has a mean weight of 70 k.gms. Can this be regarded as a sample from a population with mean weight 65 k.gms and S.D 25 k.gms with level of significance. L4 6M
 b A sample of 900 members has a mean of 3.4 cms and S.D 2.61 cms. Is the sample from a large population of mean 3.25 cm and S.D 2.61 cms. If the population is normal and its mean is unknown find the 95% fiducial limits of true mean L5 6M

UNIT-IV

- 7 a Three different machines are used for a production. On the basis of the outputs, test whether the Machines are equally effective

L4 10M

OUTPUTS		
Machine 1	Machine 2	Machine 3
10	9	20
5	7	16
11	5	10
10	6	4

- b Define R.B.D

L5 2M**OR**

- 8 a Describe briefly the technique of ANOVA for Two-way classification.
b Define L.S.D.

L4 10M**L5 2M****UNIT-V**

- 9 a The following are the figures of defectives in 22 lots each containing 2000 rubber belts:

L6 10M

425, 430, 216, 341, 225, 322, 280, 306, 337, 305, 356
402, 216, 264, 126, 409, 193, 326, 280, 389, 451, 420

Draw control chart for fraction defective and comment on the state of control of the Process.

- b write the causes of variations

L2 2M**OR**

- 10 a Ten samples each of size 5 drawn at regular intervals from a manufacturing process. The sample means chart and their range are given below. Calculate the control limits in respect of mean chart and R- chart comment on the state of control.

L5 10M

Sample no.	1	2	3	4	5	6	7	8	9	10
Mean (\bar{x})	49	45	48	53	39	47	46	39	51	45
Range (R)	7	5	7	9	5	8	8	6	7	6

- b Write the constructions of mean, range.

L5 2M

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