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

B.Tech I Year II Semester Supplementary Examinations February-2022

PROBABILITY & STATISTICS

(Common to CSE & CSIT)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

- 1 a 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. 6M
 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?
- b The probability that students A,B,C,D solve the problem are $\frac{1}{3}, \frac{2}{5}, \frac{1}{5}$ and $\frac{1}{4}$ 6M
 Respectively. If all of them try to solve the problem, what is the probability that the problem is solved.

OR

- 2 A continuous random variable has the probability density function 12M

$$f(x) = \begin{cases} kx e^{-\lambda x} & ; \text{ for } x \geq 0, \lambda > 0 \\ 0 & ; \text{ other wise} \end{cases}$$

Determine (i) k (ii) Mean (iii) Variance

UNIT-II

- 3 a Derive mean and variance of Poisson distribution. 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. 6M

OR

- 4 Find the mean and variance of a Normal distribution in which 31% of items are under 45 and 8% are over 63. 12M

UNIT-III

- 5 a Find arithmetic mean to the following data using step deviation method 6M

Marks	10-20	20-30	30-40	40-50	50-60
Frequency	5	8	25	22	10

- b Find the median to the following data 6M

x	5	8	11	14	17	20	23
f	2	8	12	20	10	6	3

OR

- 6 Calculate the correlation coefficient for the following heights (in inches) of fathers (X) and their sons (Y) 12M

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

UNIT-IV

- 7 a Fit a straight line $y=ax+b$ for the following data

6M

x	6	7	7	8	8	8	9	9	10
y	5	5	4	5	4	3	4	3	3

- b Fit a second degree polynomial to the following data by method of least squares

6M

X	0	1	2	3	4
Y	1	5	10	22	38

OR

- 8 a A die was thrown 9000 times and of these 3220 yielded a 3 or 4. Is this consistent with the hypothesis that the die was unbiased? 6M
- b Experience had shown that 20% of a manufactured product is of top quality. In one day's production of 400 articles only 50 are of top quality. Test the hypothesis at 0.05 level. 6M

UNIT-V

- 9 To examine the hypothesis that the husbands are more intelligent than the wives, an investigator took a sample of 10 couples and administered them a test which measures the I.Q. The results are as follows: 12M

Husbands	117	105	97	105	123	109	86	78	103	107
Wives	106	98	87	104	116	95	90	69	108	85

Test the hypothesis with a reasonable test at the level of significant of 0.05 and also calculate F-test.

OR

- 10 From the following data, find whether there is any significant liking in the habit of taking soft drinks among the categories of employees. 12M

Soft Drinks	Employees		
	Clerks	Teachers	Officers
Pepsi	10	25	65
Thums up	15	30	65
Fanta	50	60	30

*** END ***