Q.P. Code: 20HS0835 **R20**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

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

PROBABILITY & STATISTICS

(Common to CSE, CSIT, CSM & CIC)

Time: 3 hours Max. Marks: 60

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

UNIT-I

1 **a** A class consists of 6 girls and 10 boys. If a committee of 3 is chosen at random from the class, find the Probability that (i)3 boys are selected (ii)exactly 2 girls are selected. **L2 6M**

b Determine (i) $P(B/A)$ (ii) $P(A/B^C)$ if A and B are events with $P(A)=\frac{1}{3}, P(B)=\frac{1}{4}$, $P(A\cup B)=\frac{1}{2}$. **L3 6M**

OR

2 A random variable X has the following probability function **L3 12M**

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

Determine (i) K (ii) Evaluate $P(X\geq 6)$ and $P(0<X<5)$ (iii) if $P(X\leq K)>1/2$, find the minimum value of K (iv) variance.

UNIT-II

3 **a** The mean and variance of a binomial distribution are 4 and $\frac{4}{3}$. Find $p(X\geq 1)$. **L3 6M**

b If X is a Poisson variate such that $3P(X=4)=\frac{1}{2}P(X=2)+p(X=0)$, find (i) the mean (ii) $P(X\leq 2)$ **L3 6M**

OR

4 Derive mean and variance of Normal distribution. **L5 12M**

UNIT-III

5 **a** Find arithmetic mean to the following data using step deviation method **L1 6M**

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

b The first four moments of a distribution about the value 5 of the variables are 2, 20, 40 and 50. Calculate mean, variance, β_1 and β_2 of the distribution. **L5 6M**

OR

6 Obtain the rank correlation coefficient for the following data: **L5 12M**

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

UNIT-IV

7 By method of least squares fit a straight line to the following data; **L1 12M**

x	1	2	3	4	5
y	14	27	40	55	68

OR

8 a A die was thrown 9000 times and of these 3220 yielded a 3or 4. Is this consistent with the hypothesis that the die was unbiased? L4 6M

b A sample of 400 items is taken from a population whose standard deviation is 10. The mean of the sample is 40. Test whether the sample has come from a population with mean 38. Also calculate 95% confidence interval for the population. L4 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: L4 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. L1 12M

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

*** END ***