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

**B.Tech I Year II Semester Regular & Supplementary Examinations October-2022**  
**PROBABILITY & STATISTICS**

(Common to CSE, CSIT, CSM, CIC, CAD & CCC)

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. L3 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  $\frac{1}{3}$ ,  $\frac{2}{5}$ ,  $\frac{1}{5}$  L1 6M  
 and  $\frac{1}{4}$  respectively. If all of them try to solve the problem, what is the probability that the problem is solved.

**OR**

- 2 Probability density function of a random variable X is  $f(x) = \begin{cases} \frac{1}{2} \sin x, & \text{for } 0 \leq x \leq \pi \\ 0, & \text{elsewhere} \end{cases}$ . L3 12M
- Find the mean, mode and median of the distribution and also find the probability between 0 and  $\frac{\pi}{2}$ .

**UNIT-II**

- 3 a An insurance agent policies of 5 men all of identical age and good in health. The probability that a man of this age will be alive 30 years is  $\frac{2}{3}$ . Find the probability that in 30 years. (i) At least one man (ii) Atmost three will be alive. 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) Mean L3 6M  
 (ii)  $P(X \leq 2)$ .

**OR**

- 4 In a sample of 1000 cases, the mean of certain test is 14 and standard deviation is 2.5. L3 12M  
 Assuming the distribution to be normal find  
 (i) How many students score between 12 and 15  
 (ii) How many students score above 18? (iii) How many students score below 18?

**UNIT-III**

- 5 a Find the median to the following data; L3 6M
- |                 |       |       |       |       |       |
|-----------------|-------|-------|-------|-------|-------|
| Class intervals | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 |
| frequency       | 5     | 12    | 23    | 8     | 2     |
- b Find arithmetic mean to the following data; L3 6M

X	1	2	3	4	5
F	5	8	10	12	6

**OR**

- 6 Find two regression equations from the following data; L3 12M
- |   |    |    |    |    |    |    |    |    |
|---|----|----|----|----|----|----|----|----|
| X | 10 | 25 | 34 | 42 | 37 | 35 | 36 | 45 |
| Y | 56 | 64 | 63 | 58 | 73 | 75 | 82 | 77 |

## UNIT-IV

- 7 a Obtain a relation of the form  $y = ab^x$  for the following data by method of least squares: L4 6M

X	1	2	3	4
Y	7	11	17	27

- b Fit a  $y = ax^b$  to the following data, also calculate  $y(2.5)$ : L2 6M

X	1	2	4	6
Y	6	4	2	2

OR

- 8 a 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 standard deviation 2.5 inches. L2 6M
- b Samples of students were drawn from two universities and from their weights in kilograms, mean and standard deviations are calculated and shown below. Make a large sample test to test the significance of the difference between the means: L4 6M

	Mean	S.D	Size of the sample
University A	55	10	400
University B	57	15	100

## UNIT-V

- 9 Two random samples reveal the following results: L4 12M

Sample	Size	Sample Mean	Sum of squares of deviations from the mean
1	10	15	90
2	12	14	108

Test whether the samples came from the same normal population.

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: L5 12M

Employees

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

\*\*\* END \*\*\*