Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Regular Examinations October-2021
PROBABILITY & STATISTICS
(Common to CSE, CSIT, CSE (AI & ML) & CSE (IoT & CS including BCT)

Time: 3 hours   Max. Marks: 60

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

UNIT-I

1	a	If three coins are tossed. Find the probability of getting i) 3 heads ii) 2 heads iii) no heads.	L1	6M
	b	The probability that students A,B,C,D solve the problem are $\frac{1}{3}, \frac{2}{5}, \frac{1}{5}$ and $\frac{1}{4}$ respectively If all of them try to solve the problem, what is the probability that the problem is solved.	L3	6M

OR

2	A continuous random variable has the probability density function. $$f(x) = \begin{cases} k\,x\,e^{-\lambda x}, & \text{for } x \geq 0, \lambda > 0 \\ 0, & \text{otherwise} \end{cases}$$ Determine the constant k, find mean and variance.	L5	12M

UNIT-II

3	a	Derive mean and variance of Binomial distribution	L5	6M
	b	Two dice are thrown five times. Find the probability of getting 7 as sum i) at least once (ii) $p(1 < x < 5)$	L1	6M

OR

4	If the masses of 300 students are normally distributed with mean 68kgs and standard deviation 3kgs.How many students have masses i) Greater than 72kgs ii) Less than or equal to 64kg iii) Between 65 and 71 kgs inclusive.	L3	12M

UNIT-III

5 a Find the median to the following data ;   L3   6M

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

b Find arithmetic mean to the following data   L3   6M

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

OR

6 Calculate the correlation coefficient for the following heights(in inches)   L5   12M
   of fathers(X) and their sons(Y)

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

UNIT-IV

| 7 | Fit a second degree polynomial to the following data by method of least square | | | | | L1 | 12M |

x	0	1	2	3	4
y	1	1.8	1.3	2.5	6.3

OR

8   a   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.   L4   6M

   b   In a big city 325 men out of 600 men were found to be smokers. Does this information support the conclusion that the majority of men in this city are smokers?   L2   6M

UNIT-V

9   A random sample of 10 boys had the following I.Q's : 70,120,110,101,88,83,95,98,107 and 100
   i) Do these data support the assumption of a population mean I.Q of 100?
   ii) Find a reasonable range in which most of the mean I.Q values of samples of 10 boys lie.   L1   12M

OR

10   a   Find the maximum difference that we can expect with probability 0.95 between the mean of samples of sizes 10 and 12 from a normal population if their standard deviations are found to be 2 and 3 respectively.   L1   6M

   b   The number of automobile accidents per week in a certain community are as follows: 12, 8, 20, 2, 14, 10, 15, 6, 9, 4. Are these frequencies in agreement with the belief that accident conditions were the same during this 10 week period.   L2   6M

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