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

B.Tech I Year II Semester Regular Examinations October-2020

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** Determine (i) $P(B/A)$ (ii) $P(A/B^c)$ if A and B are events with $P(A) = 1/3$, $P(B) = 1/4$, $P(A \cup B) = 1/2$ **6M**
- b** 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?

OR

- 2** A random variable X has the following probability function **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 $4/3$. Find $P(X \geq 1)$. **6M**
- b** If X is a Poisson variant such that $3P(X = 4) = \frac{1}{2}P(X = 2) + P(X = 0)$ find **6M**
- (i) mean (ii) $P(X \leq 2)$

OR

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

UNIT-III

- 5 a** Find arithmetic mean to the following data **6M**

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

- b** Find the median to the following data **6M**

Class Intervals	40-50	50-60	60-70	70-80	80-90
Frequency	5	12	23	8	2

OR

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

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

- b** From the following regression equations $20X - 9Y = 107$, $4X - 5Y = -33$, calculate \bar{X} , \bar{Y} and r. **6M**

UNIT-IV

- 7 a Fit a second degree polynomial to the following data by method of least squares **6M**

X	0	1	2	3	4
Y	1	1.8	1.3	2.5	6.3

- b 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

OR

- 8 a It is claimed that a random sample of 49 tyres has a mean life of 15200 km. This sample was drawn from a population whose mean is 15150 kms and standard deviation of 1200 km. Test the significance at 0.05 level. **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 levels. **6M**

UNIT-V

- 9 Two random samples reveal the following results: **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 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. **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. **6M**

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