ASSIGNMENT (Mathematics)
Branch:- CSE (IInd Sem) & EEE (IVth sem)

Answered the following questions:-

1 (a) State and prove Baye's theorem.

(b) Players A and B throw a pair of dice. A wins if he throws 6 before B throws 7 and B, if he throws 7 before A throws 6. If A begins, Prove that his chance of winning is $30/61$.

2 (a) A random variable X follows binomial distribution with parameters $n = 40$ and $p = \frac{1}{4}$. Use Chebyshev's inequality to find bounds for (i) $P[|X-10|<8]$ (ii) $P[|X-10|>10]$

(b) Let the Continuous random variable X and Y have Joint probability density function as
$$f(x,y) = \begin{cases} xy, & 0<x<y, 0<y<1 \\ 0, & elsewhere \end{cases}$$
(i) Determine whether X and Y are independent
(ii) Find $P(X>\frac{1}{2})$ (iii) Find $P[x<\frac{1}{2}, Y>\frac{1}{3}]$ (iv) Find $P[X+Y>\frac{1}{2}]$

3 (a) Define exponential distribution and find its mean and variance of X.

(b) Let X be a Continuous random variable with moment generating function $M_X(t) = Cost \, e^{5t + 9t^2}$. Find mean and Variance of X.

4 (a) The following Marks have been obtained by a Class of Students in Mathematics (out of 100):

Paper X: 80 45 55 56 58 60 65 68 70 75

Paper Y: 82 56 50 48 60 62 64 65 70 74

Compute the co-efficient of Correlation for the above datta. Also, find the line of regression of Y and X.

(b) Find the Kurtosis of the given below:

Class interval	0-10	10-20	20-30	30-40	40-50
Frequency	10	20	40	20	10

5 (a) Fit a straight line to the following data.

x	71	68	73	69	67	65	66	67
y	69	72	70	70	68	67	68	64

(b) A Stenographer claims that she can type at the rate of 120 words per minute. Can we reject her claim on the basis of 100 trails in which she demonstarates a mean of 116 words with a standard deviation of 15 words? Use 5% level of significance.

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