[This question paper contains 4 printed pages.]

Your Roll No..............

Sr. No. of Question Paper : 3699 **H**

Unique Paper Code : 6202451203

Name of the Paper : Mathematics for computing -II

Name of the Course : **B.Voc.**

Semester : II

Duration : 3 Hours Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **any 5** questions.
3. **All** questions carry equal marks.

1. (a) Define sample space and mutually exclusive events with example.

   (b) Prove that probability of impossible event is zero.

P.T.O.

2. (a) State and prove that Baye's theorem.

(b) Let variate X have the distribution P ... $= P(X = 2) = p, P(X = 1) = 1 - 2p \; 0 \leq p \leq \frac{1}{2}$, what value of p the variance is maximum.

3. (a) State and prove that central limit theorem.

(b) If X is a Poisson variate such that $P(X = 2)$ ... $9P(X = 4) + 90P(X = 6)$ Calculate mean a... variance of X,

4. (a) Explain correlation coefficients of random variables with formulas.

(b) A computer calculating correlation coefficient between two variables X and Y from 25 pairs of observations obtained the following results $n = 25$, $\Sigma X = 125$, $\Sigma X^2 = 650$, $\Sigma Y = 100$, $\Sigma Y^2 = 460$, $\Sigma XY = 508$, later discovered at the time of checking that he had copied down two pairs as X *has* 6, 8 *and* Y *has* 14, 6 while the correct values are X *has* 8, 6 and Y *has* 12, 8. Obtain the correct value of correlation coefficients.

n=25
Σx = 125
Σx² = 650 Σy = 100
Σy² = 40
X=(6,8) X=(8,6
Y=(14,6)

5. (a) Explain Chapman Kolmogorov equations and its applications?

(b) A random variable X has the following probability distribution

$9k^2+12k-1=0$

	0	1	2	3	4	5	6	7
)	0	k	2k	2k	3k	k^2	$2k^2$	$7k^2 + k$

then calculate the value of

(i) k,

(ii) $P(X < 6)$,

(iii) $P\ (0 < X < 5)$

$9k^2+12k-1=0$

$\frac{-b \pm \sqrt{b^2-4ac}}{2a}$

6. (a) Discuss the stochastic process with examples?

(b) The joint probability density functions of two-dimensional random variables

$$f(x, y) = 2, \qquad 0 < x < 1,\ 0 < y < x,$$

(i) Find the marginal density functions of X *and* Y.

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(ii) Find the conditional density functions of Y given $X = x$, and conditional density functions of X given $Y = y$.

7. (a) A problem in Statistics is given to the three students A, B and C whose chances of solving it are *1 / 2 ,3 /4, and 1 /4* respectively. What is, the probability that the problem will be solved if all of them try independently?

(b) A random variable X has a mean value of 5 and variance of 3,what is the least value of probability $|X - 5| < 3$.

$P(|X-5| < 3) = 1 - \frac{\sigma^2}{\epsilon^2} \rightarrow \frac{3}{9}$

$1 - \frac{1}{3}$

$\frac{2}{3}$

$P(A/B) = \frac{P(A \cap B)}{P(B)}$

$P(A \cap B) = P(A/B) \cdot P(B)$

9+12-1

27/9

24

48