

- (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 $|X - 5| < 3$.

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 3699

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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.

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

(b) Let variate X have the distribution $P(X=0)$

$$= P(X=2) = p, P(X=1) = 1-2p \quad 0 \leq p \leq \frac{1}{2}, \quad \text{for}$$

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 and 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.

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

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

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

then calculate the value of

(i) k ,

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

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

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

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

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

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