X \ Y	−1	0	1
0	$\frac{1}{15}$	$\frac{2}{15}$	$\frac{1}{15}$
1	$\frac{3}{15}$	$\frac{2}{15}$	$\frac{1}{15}$
2	$\frac{2}{15}$	$\frac{1}{15}$	$\frac{2}{15}$

Calculate (i) marginals distributions of *X and Y.*

(ii) the conditional distribution of *X given* $Y = 2$

7. (a) An urn contains **4** tickets numbered **1, 2, 3,4** and another contains **6** tickets numbered **2, 4, 6, 7, 8, 9.** If one of the two urns is chosen at random and a ticket is drawn at random from the chosen urn, find the probabilities that the ticket drawn bears the number

(i) 2 or 4,

(ii) 3,

(iii) 1 or 9.

(b) State and prove Chebyshev's inequality.

(500)

[This question paper contains 4 printed pages.]

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

Sr. No. of Question Paper : 1034 **F**

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) Explain random experiment and conditional probabilities with examples.

(b) Prove that probability of the complementary event $\bar{A}$ is given by $P(\bar{A}) = 1 - P(A)$.

2. (a) Define covariance of random variables.

(b) The ranks of same 16 students in mathematics and physics are as follows. Two numbers within brackets denote the rank of the students in mathematics and physics **(1, 1), (2, 10), (3, 3), (4, 4), (5, 5), (6, 7), (7, 2), (8, 6), (9, 8), (10, 11), (11, 15), (12, 9), (13, 14), (14, 12), (15, 16), (16, 13)** calculate the rank correlation coefficient for proficiencies of this group in mathematics and physics.

3. (a) Explain probability mass functions and probability density functions?

(b) If X and Y are independent Poisson variates such that $P(X = 1) = P(X = 2)$ and $P(Y = 2) = P(Y = 2)$ calculate the variance of $X - 2Y$.

4. (a) Prove that in a Poisson distribution with unit mean, mean deviation about mean is $\frac{2}{e}$ times the standard deviation.

(b) In a partially destroyed laboratory record of an analysis of correlation data the variance of $X = 9$, regression equations are $8X - 10Y + 66 = 0$, $40X - 18Y = 214$, calculate

(i) the mean values of **X** and **Y**

(ii) the correlation coefficient between X and

5. (a) Define Pseudo random numbers and random numbers generations?

(b) The diameter of an electric cable says X is assumed to be a continuous random variable with probability density functions $f(x) = 6x(1 - x)$, $0 \leq x \leq 1$,

(i) check that it is probability density functions

(ii) determine a number b such that $P(X < b) = P(X > b)$.

6. (a) Analyze Markov chain and its applications?

(b) The bivariate probability distribution is given as