3016

B.Tech. (CSE) 2nd Semester (G-Scheme)

Examination, May-2023

MATH-II

Paper - BSC-MATH-104-G

Probability and Statistics

Time allowed : 3 hours] *[Maximum marks :75*

***Note:** Attempt five questions in total by selecting one question from each unit. Question no. 1 is compulsory.*

1. (a) Define probability spaces.

(b) Explain multinomial distribution.

(c) State memoryless property of exponential distribution.

(d) Fit a straight line y = a + bx to the following data by method of least squares.

x	0	1	3	6	8
y	1	3	2	5	4

(e) Explain

(i) Null hypothesis

(ii) Alternative hypothesis

(iii) Level of significance

(f) A random sample of 27 pair of observations from a normal population gives a correlation coefficient of 0.6. Is this significant of correlation in population? 15

Unit - I

2. (a) A purse contains two silver coins and four copper coins. A second purse contains four silver and three copper coins. If a coin is pulled out at random from one of the two purses, what is the probability that it is a silver coin?

(b) Four coins are tossed. What is the expectation of number of heads? 15

3. (a) State and prove Chebyshev's inequality.

(b) A car-hire firm has two cars, which it hires out day by day. The number of demands for a car on each day is distributed as a Poisson distribution with mean 1.5. Calculate the proportion of days on which neither car is used and the proportion of days on which some demand is refused ($e^{-1.5} = 0.2231$). 15

Unit - II

4. (a) Is the function given below a density function?

$$f(x) = \begin{cases} 0 & \text{for } x<2 \\ \frac{1}{18}(3+2x) & \text{for } 2 \le x \le 4 \\ 0 & \text{for } x>4 \end{cases}$$

Also find $P(2 \le x \le 3)$.