

Enrollment No.:

SLCSE00771


BENNETT
UNIVERSITY
THE TIMES GROUP

School: School of Computer Science Engineering & Technology

MID-TERM EXAMINATION, ODD SEMESTER, OCTOBER 2025

Programme: B.Tech	Semester: 3 rd
Course Code: CSET240	Course Name: Probability and Statistics
Time: 01 Hour	Max. Marks: 20

Instructions:

1. Attempt all the sections.
2. Do not write anything on the question paper except the enrollment number.
3. Assume missing data suitably, if any.
4. Non-programmable calculators are allowed.

CO No.	Course Outcome Statements	Bloom's Taxonomy Level
CO1	Apply fundamental concepts of probability, conditional probability, and random variables to solve engineering problems.	BL2 , BL3
CO2	Analyze and interpret real-world data using statistical inference methods such as hypothesis testing and confidence intervals.	BL3 , BL4

SECTION A

(3Q x 2M = 06 Marks)

ALL QUESTIONS ARE COMPULSORY

S. No.		Marks	Course Outcome	BTL Level																
Q1	Alex is choosing two movies to watch over the weekend. The probability that he enjoys the first movie is 0.6, and the probability that he enjoys the second movie is 0.5. The probability that he enjoys both movies is 0.35. Determine the probability of that Alex enjoys neither of the two movies.	2	CO1	BL2																
Q2	A driver is eagerly eyeing a precious parking space some distance down the street. There are five cars in front of the driver, each of which having a probability 0.2 of taking the space. Determine the probability that the car immediately ahead will enter the parking space?.	2	CO2	BL2																
Q3	<p>Let consider the following random variable X, along with PMF:</p> <table><tr><td>X</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>P(X)</td><td>k</td><td>2k</td><td>2k</td><td>3k</td><td>k²</td><td>2k²</td><td>7k² + k</td></tr></table> <p>(a) Find the value of k (b) Find $P[2 \leq X < 5]$</p>	X	1	2	3	4	5	6	7	P(X)	k	2k	2k	3k	k ²	2k ²	7k ² + k	2	CO1	BL2
X	1	2	3	4	5	6	7													
P(X)	k	2k	2k	3k	k ²	2k ²	7k ² + k													

SECTION B
(2Q x 3M = 06 Marks)

ATTEMPT ANY TWO QUESTIONS

Q4	If 20% of the bolts produced by a machine are defective, determine the probability that out of 4 bolts chosen at random, at most 2 bolts will be defective.	3	CO2	BL3												
Q5	Suppose that a number of miles that a car can run before its battery wears out is exponentially distributed with an average value of 10,000 miles. If a person desires to take a 5,000-mile trip, determine the probability that she will be able to complete her trip without having to replace her car battery.	3	CO2	BL3												
Q6	<p>Given the following data of two variables, X and Y:</p> <table><tr><td>X:</td><td>2</td><td>4</td><td>4</td><td>4</td><td>6</td></tr><tr><td>Y:</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr></table> <p>a) Calculate the covariance between X and Y. b) Calculate the correlation coefficient between X and Y.</p>	X:	2	4	4	4	6	Y:	4	5	6	7	8	3	CO2	BL1
X:	2	4	4	4	6											
Y:	4	5	6	7	8											

SECTION-C
(2Q x 4M = 08 Marks)

ATTEMPT ANY TWO QUESTIONS

Q7	<p>The members of a consulting firm rent cars from three rental agencies: 50% from agency 1, 35% from agency 2, and 15% from agency 3. If 8% of the cars from agency 1 need an oil change, 25% of the cars from agency 2 need an oil change, and 5% of the cars from agency 3 need an oil change, find the probability that a car requiring an oil change came from rental agency 2.</p>	4	CO1	BL3						
Q8	<p>A program consists of two modules. The number of errors, X, in the first module and the number of errors, Y, in the second module have the following joint distribution: $P(0, 0) = 0.15$, $P(0, 1) = 0.25$, $P(1, 0) = 0.2$, $P(1, 1) = 0.1$, $P(1, 2) = 0.15$, $P(1, 3) = 0.05$, $P(0, 2) = 0.05$, $P(0, 3) = 0.05$, where $P(x, y)$ stands for $P(X = x, Y = y)$. Find (a) The marginal distributions of X and Y. (b) The probability of no errors in the first module. (c) Find out if errors in the two modules occur independently.</p>	4	CO1	BL3						
Q9	<p>The following data are given for the variable X:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>X</td> <td>2</td> <td>4</td> <td>6</td> <td>8</td> <td>10</td> </tr> </table> <p>(a) Compute the skewness and kurtosis of X. (b) Write the type of skewness and kurtosis for X.</p>	X	2	4	6	8	10	4	CO1	BL3
X	2	4	6	8	10					