Course Code: OBC103 Last Date of Submission: 15.1.2024
Course Title: Mathematical Foundation of Computer Science
Maximum Marks: 30
Assignment No.: 2 Session: July 2023

Note:
1. The assignment will have two parts, A and B. Part A is of 10 MCQ-type Questions of 1 mark each.

2. Part B is of 20 Marks having 8 Descriptive Questions. Attempt any 5 out of 8.

Part-A (10x1=10 Marks)

Q.No	Question	CO
1	What is probability theory primarily concerned with? a. Deterministic outcomes b. Uncertain outcomes c. Historical outcomes d. Singular outcomes	CO1
2	In probability theory, what does the term "random experiment" refer to? a. An experiment with a fixed outcome b. An experiment with unpredictable outcomes c. An experiment with only one possible result d. An experiment with a predetermined outcome	CO1
3	What is the set of all possible outcomes of a random experiment called? a. Event b. Outcome space c. Sample space d. Probability space	CO1
4	If two events cannot occur simultaneously, what is the term used to describe them? a. Mutually exclusive b. Independent c. Joint events d. Complementary events	CO1
5	If event A and event B can both occur simultaneously, what is their relationship? a. Mutually exclusive b. Independent c. Complementary d. Dependent	CO1
6	Which method involves making a matrix upper triangular to find its determinant? a. Elimination method b. Sarrus method c. Minor method d. Cofactor method	CO1
7	What is the sum of probabilities for all possible outcomes in a sample space?	CO1

	a. 0 b. 1 c. 2 d. 0.5	
8	If P(A) is the probability of event A and P(B) is the probability of event B, what is P(A | B)? a. P(A) + P(B) b. P(A) - P(B) c. P(A and B) / P(B) d. P(A or B) * P(B)	CO1
9	If J is a 2x3 matrix and K is a 3x2 matrix, what is the order of the product JK? a. 2x3 b. 3x3 c. 2x2 d. 3x2	CO1
10	What is the formula for Bayes' Theorem? a. P(A | B) = P(B | A) * P(A) / P(B) b. P(A and B) = P(A) * P(B) c. P(A | B) = P(A) * P(B) / P(A and B) d. P(A and B) = P(A | B) * P(B) / P(A)	CO1

Part-B (5x4=20 Marks)

Q.No	Question	CO
1	If the probability of event A is 0.3, what is the probability of the complement of A?	CO5
2	Given matrices F and G: $F = \begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix}, \quad G = \begin{bmatrix} 1 & 0 \\ 5 & 2 \end{bmatrix}$ Find $F + G$ and $F - G$.	CO3
3	Consider two events A and B. If the probability of A is 0.4 and the probability of B is 0.6, what is the Law of Total Probability?	CO1
4	Consider the matrix: $B = \begin{bmatrix} 2 & 4 & 6 \\ 1 & 3 & 5 \\ 7 & 8 & 9 \end{bmatrix}$ Calculate the minor and cofactor of the element in the first row and second column.	CO3
5	Let $H = \begin{bmatrix} 2 & 4 \\ 1 & 3 \end{bmatrix}$. Find $2H$.	CO3
6	Given the matrix $M = \begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix}$, find the determinant using the elimination method.	CO3

7	Apply the Rules of Sarrus to find the determinant of the 3×3 matrix: $C = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$	CO5
8	If K is a 2x3 matrix and L is a 3x2 matrix, what is the order of KL?	CO2