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)

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| 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?  a. 0  b. 1  c. 2  d. 0.5 | CO1 |
| 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)

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| 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 |  | 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 |  | CO3 |
| 5 |  | CO3 |
| 6 |  | CO3 |
| 7 |  | CO5 |
| 8 | 4. What is the Cartesian product of A = {1, 2} and B = {a, b}?  a) {(1, a), (1, b), (2, a), (b, b)}  b) {(1, 1), (2, 2), (a, a), (b, b)}  c) {(1, a), (2, a), (1, b), (2, b)}  d) {(1, 1), (a, a), (2, a), (1, b)  4. What is the Cartesian product of A = {1, 2} and B = {a, b}?  a) {(1, a), (1, b), (2, a), (b, b)}  b) {(1, 1), (2, 2), (a, a), (b, b)}  c) {(1, a), (2, a), (1, b), (2, b)}  d) {(1, 1), (a, a), (2, a), (1, b)  4. What is the Cartesian product of A = {1, 2} and B = {a, b}?  a) {(1, a), (1, b), (2, a), (b, b)}  b) {(1, 1), (2, 2), (a, a), (b, b)}  c) {(1, a), (2, a), (1, b), (2, b)}  d) {(1, 1), (a, a), (2, a), (1, b)  If *K* is a 2x3 matrix and *L* is a 3x2 matrix, what is the order of *KL*? | CO2 |