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Daffodil International University

Faculty of Science & Information Technology

Department of Software Engineering

Midterm Examination, Summer 2026

Course Code: SE123; Course Title: Discrete Mathematics

Sections &Teachers: A,B,C,D(MSM), E,F,G(MSI),H,I,J,K(AR), L,M(KNA),N,O(HIM)

Time: 1 Hour 30 Mins **Marks: 25**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.		University Scholarship Eligibility: A university awards a scholarship based on the following conditions, "A student will receive the scholarship if the student has a CGPA above 3.60 and has attended at least 85% of classes." **a)** Interpret the possible statement in variable and express the scholarship policy using propositional logic symbols. **b)** Express the truth table for the proposition representing the policy and identify under which conditions a student receives the scholarship. **c)** Clarify the DeMorgan's law for propositional logic.	**[Marks:3+3+4]**	**CLO-1** *Level-2*
2.		A fair coin has two possible outcomes: Heads (H) and Tails (T). The coin is tossed independently 6 times. Let a Head be considered a success. Now apply the concept of probability and show the full solution to the following problems: (a) The probability that exactly two heads occurs. (b) The probability of getting at least four heads. (c) The probability of getting no heads.	**[Mark: 7.5 (2.5+2.5+2.5)]**	**CLO-2** *Level-3*
3.		A university conducted a survey of 100 students regarding membership in three student clubs. There are 45 students who are members of the Programming Club and 35 students who are members of the Robotics Club. Also 30 students who are members of the AI Club. The survey revealed that 15 students are members of both the Programming Club and the Robotics Club, 10 students are members of both the Programming Club and the AI Club, and 8 students are members of both the Robotics Club and the AI Club. Furthermore, 5 students are members of all three clubs simultaneously. Now apply the concepts of set theory and answer the following questions: a) Determine the number of students who are members of either the Programming Club or Robotics Club. b) Find the number of students who belong to at least one of the three clubs. c) Calculate the number of students who are not members of any club.	**[Mark: 7.5 (2.5+2.5+2.5)]**	**CLO-2** *Level-3*