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Daffodil International University

Department of Software Engineering
Faculty of Science & Information Technology
Midterm Examination, Spring 2026

Course Code: SE 123; Course Title: Discrete Mathematics

Sections & Teachers: 44(A-D), 44(E-F), 44(G-I), 44(J) (DSM, AR, FC & MKS)

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.		Read the following scenario carefully and **interpret the logical relationships** embedded in the policy: Either Alex will attend the meeting or Lisa will work from home. If Lisa works from home, she will complete the report. If Alex attends the meeting, then the manager will be present. The manager will not be present. Therefore, Lisa will complete the report.		
	a)	**Interpret** the scenario and identify four fundamental propositions. Clearly define each and assign appropriate propositional variables.	**[Marks-4]**	**CLO-01** *Level-2*
	b)	**Clarify** the De Morgan's Laws are logically equivalent or not.	**[Marks-4]**	
	c)	**Express** the truth value of the statement if the domain consists of all integers. $\forall n(n+1 > n)$	**[Marks-2]**	
2.	**a.**	In a box there are two types of Ping-Pong balls. 10 of them are orange and 15 are white. Now **apply** the concept of probability and find the following outcomes. Suppose in each case the Ping-Pong balls are not replaced after picking, then after two trial_ a) What is the probability that all are orange balls? b) What is the probability when none are orange balls? c) What is the probability when Just one orange balls?	**[Marks-2.5+2.5+2.5]**	**CLO-02** *Level-3*
	b.	A college has a group of 30 students who have registered for three elective subjects: Artificial Intelligence (AI), Blockchain Technology, and Cloud Computing. Among these students 15 students are enrolled in Artificial Intelligence, 12 students are enrolled in Blockchain Technology, 10 students are enrolled in Cloud Computing. Additionally, 5 students are enrolled in both Artificial Intelligence and Blockchain Technology, 4 students are enrolled in both Artificial Intelligence and Cloud Computing, and 3 students are enrolled in both Blockchain Technology and Cloud Computing. Notably, 2 students are enrolled in all three subjects. Now **apply** the concepts of set theory and answer the following questions: a) What is the number of students who are enrolled in exactly one course? b) How many students are enrolled in at least two courses? c) What is the number of students who are enrolled in none of the three courses?	**[Marks-2.5+2.5+2.5]**	