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Daffodil International University

Department of Software Engineering

Faculty of Science & Information Technology

Final Examination, Fall 2023

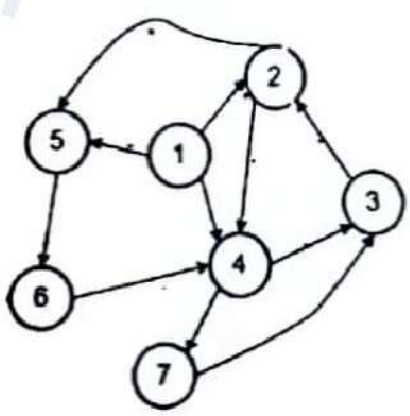
Course Code: SE 123; Course Title: Discrete Mathematics

Sections & Teachers: All (NF,RM)

Time: 2:00 Hrs. **Marks: 40**

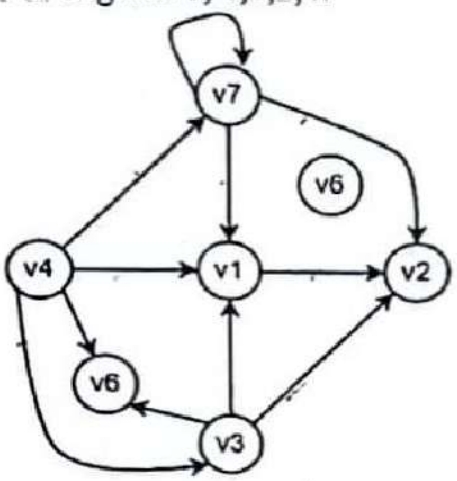
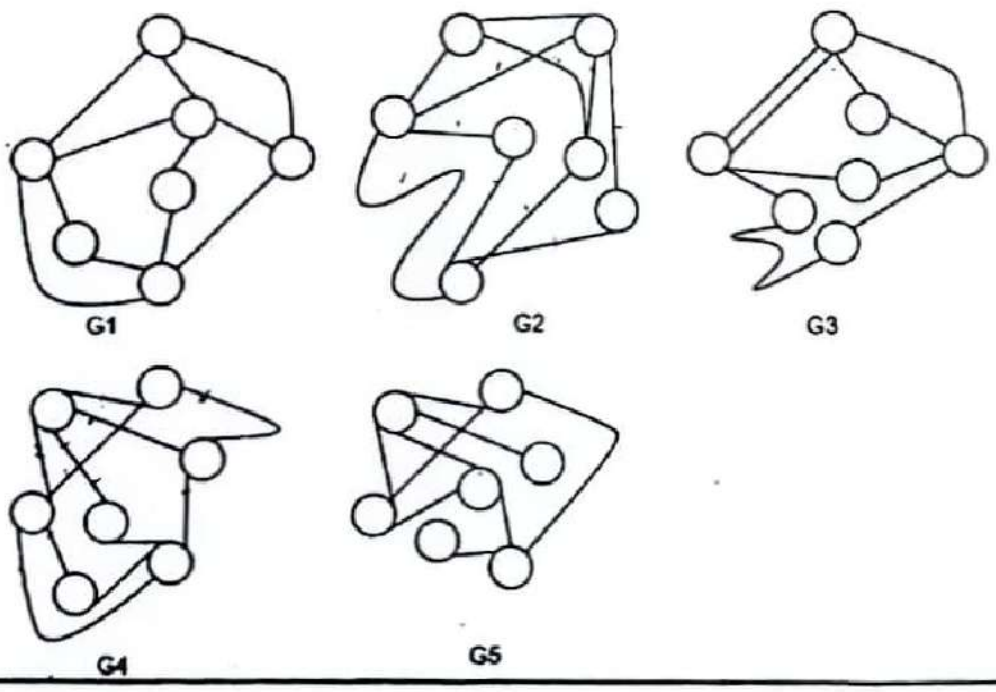
Answer ALL Questions

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

1		In a game, a player rolls three distinct six-sided dice: a red die, a blue die, and a green die. Each die is fair and has faces numbered from 1 to 6. The player wins if the following conditions are met: 1. The number on the red die is even. 2. The number on the blue die is either 2 or 5. 3. The sum of the numbers on the red and green dice is greater than the number on the blue die. **Identify** the problem and calculate the probability of the player winning the game.	[Marks-10]	CL Lev
2		A directed graph is illustrated in Figure 1. **Examine** the figure and **utilize** the concept of relational algebra to find out the set of relations exists in the directed graph. After that, find out the inverse of the relation and redraw the directed graph for inverted relation.  	[Marks-10]	CL Lev

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3		A graph has been illustrated in Figure 2. **Analyze** the graph, redraw the figure on your answer script, and mark the edges with proper sequential notation. Evaluate the graph in terms of (i) number of vertices, (ii) number of edges, (iii) degree sequence, (iv) parallel edges, and (v) total degree. vi) Loops of the degrees vii) Construct a graph with 5 vertices of degrees 1, 1,2,2,4.  *Figure 2: Graph 1*	[Marks-13]	CLO-4 *Level-4*
4		**Determine the** isomorphic and non-isomorphic graphs from the set of graphs illustrated below. **Justify** your answer with valid logic of graph theory. 	[Marks-07]	CLO-4 *Level-5*