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Daffodil International University

Faculty of Science & Information Technology

Final Examination, Spring 2023

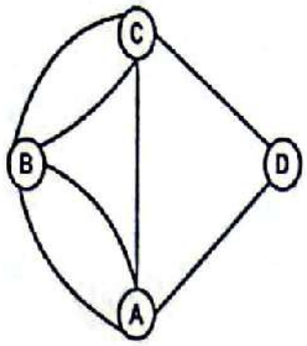
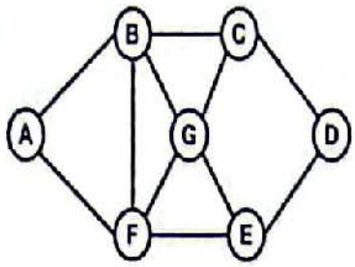
Course Code: CSE236: Course Title: Math for Computer Science

Level: 3 **Term: 1** **Batch: 59**

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.	***a)***	**Justify** whether the following graph has at least one Euler path and Euler Circuit (Fig 1), Hamiltonian Path and Hamiltonian Circuit (Fig 2)  Fig 1  Fig 2	**[8]**	**CO3**
	b)	**Construct** Hasse Diagram for ({2,4,6,8,10,16,18,20,24,36,72}, /) Using the constructed Hasse Diagram Identify the following attributes i) Maximal Elements and greatest Elements ii) Minimal Elements and Least Elements iii) All upper bound of {2,10,18} iv) All lower bound of {4,20,24}	**[8]**	**CO3**
2.	***a)***	**Solve** $\sum_{k=1}^{n} K^2 = \frac{n(n+1)(2n+1)}{6}$ using proof by induction method.	**[4]**	**CO2**
	b)	Use rules of inference to prove the following argument is valid: i) If it rains, I will take a leave If it is hot outside, I will go for a shower Either it will rain or it is hot outside Prove Therefore – "I will take a leave or I will go for a shower" using rules of inference. ii)Prove that if, $p \rightarrow (q \vee r)$ and $q \rightarrow s$ and $r \rightarrow t$, then $p \rightarrow (s \vee t)$.	**[6]**	**CO2**

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3.	*a)*	**Find** How many strings of eight English letters are there (consider only uppercase letter)? i) That contain no vowels, if letters can be repeated? ii) That contain no vowels, if letters cannot be repeated? iii) That start with a consonant, if letters can be repeated? iv) That start with a vowel, if letters cannot be repeated?	[8]	CO2
4.	*a)*	**Illustrate** the undirected graph represented by the given adjacency matrix and Prove handshaking theorem for this graph. $$\begin{array}{c} \\ a \\ b \\ c \\ d \end{array}\begin{array}{c} \begin{array}{cccc} a & b & c & d \end{array} \\ \begin{bmatrix} 1 & 2 & 0 & 1 \\ 2 & 0 & 3 & 0 \\ 0 & 3 & 2 & 2 \\ 0 & 1 & 0 & 1 \end{bmatrix} \end{array}$$	[06]	CO3

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