LOVELY PROFESSIONAL UNIVERSITY

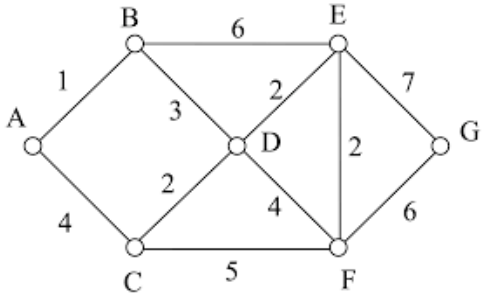
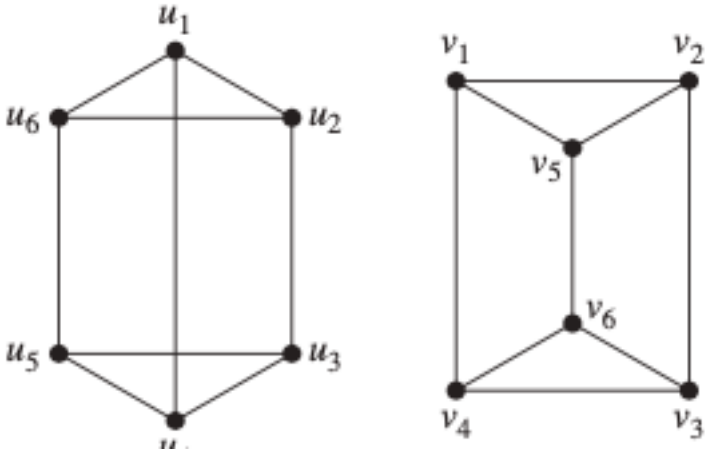
Transforming Education Transforming India

Academic Task Number: 3 **Course code: MTH-401**

Date of allotment: 18/04/2023 **Course title: Discrete Mathematics**

Date of submission: 29/04/2023 **Maximum Marks: 30**

Academic Task Type: Continuous Assessment Test (Subjective) **R-01**

Question Number	Question Statement	Course Outcome	Bloom's level	Marks per Question
Q1	Using Dijkstra's Algorithm, find the shortest path tree in the graph given in the figure from vertex A 	CO3	L3: Apply	10
Q2	Show that the following graphs are isomorphic. 	CO4	L3: Apply	10
Q3	(A) Construct a complete graph, a cycle, a wheel, a tree and a cube having four vertices. (B) Write the chromatic number of each graph asked in part (A).	CO5	L3: Analyze	10

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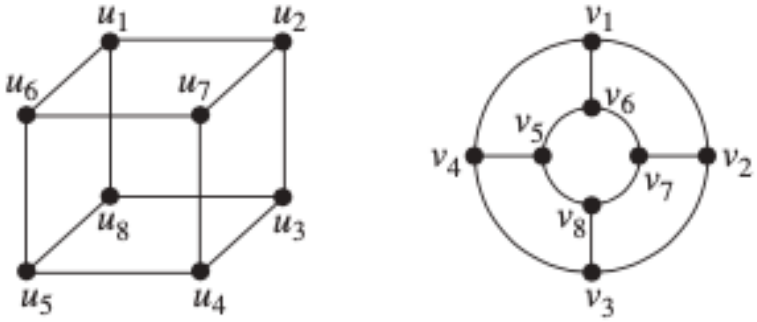
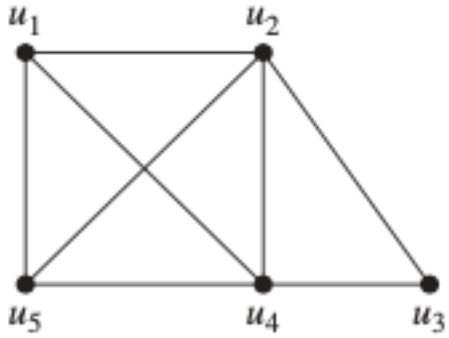
Academic Task Type: Continuous Assessment Test (Subjective) **R-02**

Question Number	Question Statement	Course Outcome	Bloom's level	Marks per Question
Q1	Show that the graphs given below are isomorphic. 	CO3	L3: Apply	10
Q2	(A) State Euler's theorem for planar graphs. Also, show that the graph K_5 is not planar using a theorem. (B) Construct the dual of the following graph 	CO4	L3: Apply	10
Q3	(A) Construct the ordered rooted tree for the following expressions. (i) $(x^y + y^z + z^x) + xy$ (ii) $\neg(p \wedge q) \equiv \neg p \vee \neg q$ (B) Find the value of the post fix expression $5\ 2\ 1 - -3\ 1\ 4 + + \times$	CO5	L3: Analyze	10

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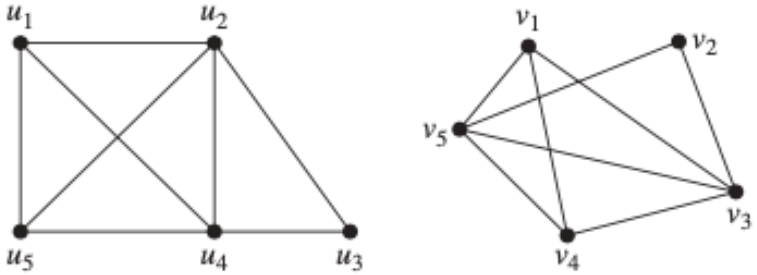
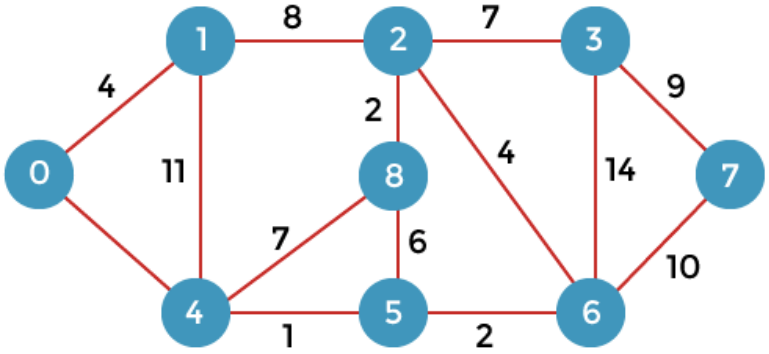
Academic Task Type: Continuous Assessment Test (Subjective) **R-03**

Question Number	Question Statement	Course Outcome	Bloom's level	Marks per Question
Q1	Show that the graphs given below are isomorphic. 	CO3	L3: Apply	10
Q2	(A) Define a planar graph. State Euler's theorem for planar graphs. Also, show that the graph K_5 is not planar using a theorem. (B) Using Prim's Algorithm, find the minimum spanning tree from the weighted graph given in Q3.	CO4	L3: Apply	10
Q3	Using Dijkstra's Algorithm, find the shortest path tree in the graph given below. 	CO5	L3: Analyze	10

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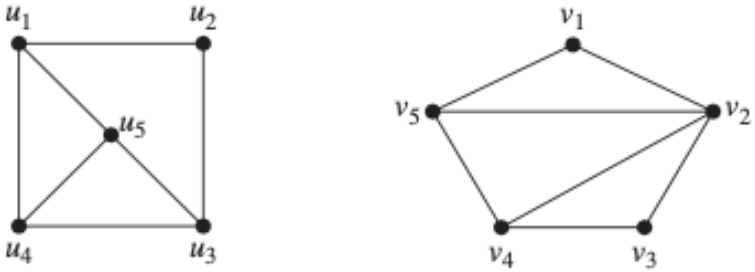
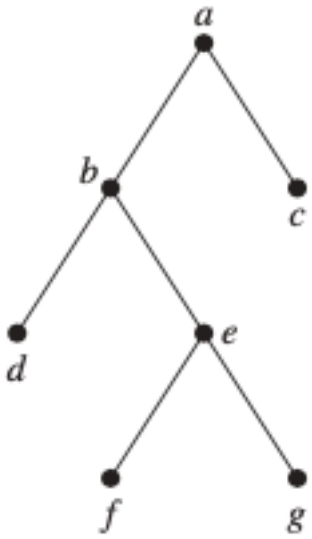
Academic Task Type: Continuous Assessment Test (Subjective) **R-04**

Question Number	Question Statement	Course Outcome	Bloom's level	Marks per Question
Q1	(A) Check whether the graphs are isomorphic or not. Justify your answer.  (B) Construct the adjacency matrix and incidence matrix of the above graphs.	CO3	L3: Apply	10
Q2	(A) Write down the order and size of the following graphs. (i) K_n (ii) $K_{5,7}$ (iii) W_9 (B) Also write down the chromatic number of each of these graphs given in part (A).	CO4	L3: Apply	10
Q3	(A)Write the pre order form of the following rooted tree.  (B) Solve the prefix expression. $+ - \uparrow 3\ 2\ \uparrow 2\ 3 / 6 - \ 4\ 2$	CO5	L3: Analyze	10

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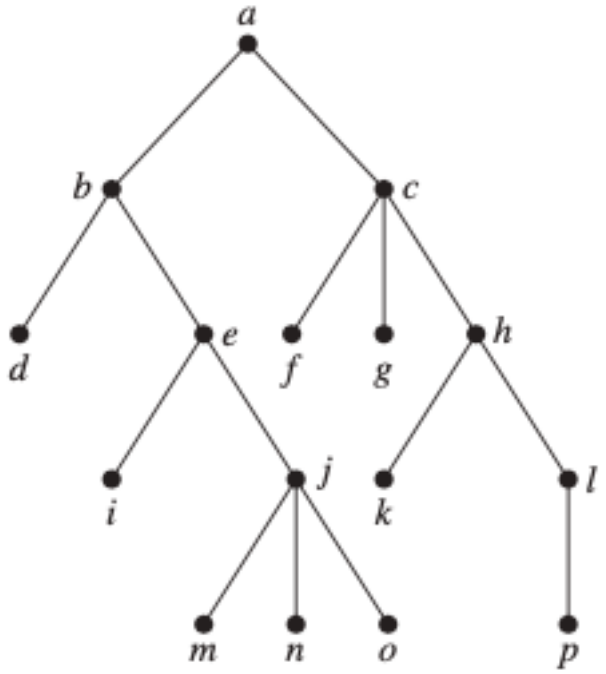
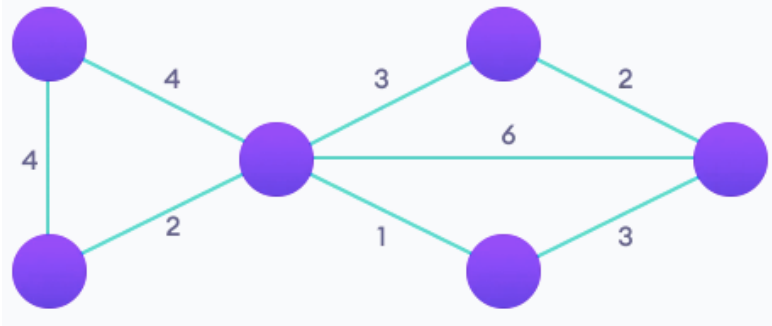
Academic Task Type: Continuous Assessment Test (Subjective) | **R-05**

Question Number	Question Statement	Course Outcome	Bloom's level	Marks per Question
Q1	(A) Draw a rooted ordered tree for the following expression. $+ \times + - 5\ 3\ 2\ 1\ 4$ (B) Find the value of the postfix expression $9\ 3\ /\ 5\ +\ 7\ 2\ -\ \times$	CO3	L3: Apply	10
Q2	Determine the order in which the pre order visits the vertices of the following ordered rooted tree. 	CO4	L3: Apply	10
Q3	Using Dijkstra's Algorithm, find the shortest path tree in the graph given below. 	CO5	L3: Analyze	10