

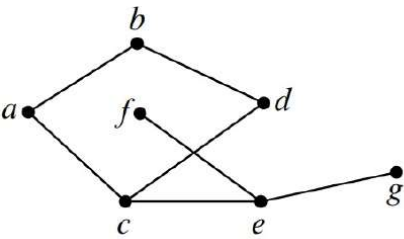
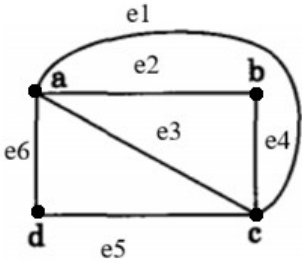
INDIRA UNIVERSITY, PUNE
SCHOOL OF INFORMATION TECHNOLOGY-BSC DS
Term End Examination (2025 Pattern) April- May – 2026- Semester – II

Course Name: Graph Theory
Course Code: 25BDS209T

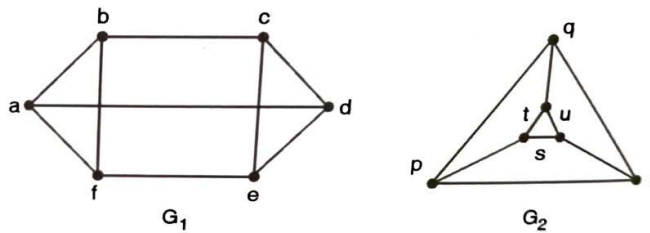
Max. Marks: 25
Time: 1 Hr. 30 Minutes

Instructions

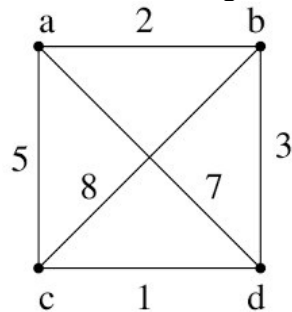
- All questions are compulsory.
- Draw neat, labelled diagram wherever necessary

Q1.	Attempt any 5 out of 7. (1 Mark each) a) State Handshaking Lemma. b) Draw a Wheel graph W_4. c) Write a circuit of length 4 in the following graph  d) Define Centre of a Tree. e) What is the value of the postfix expression: $+ - \uparrow 3 2 \uparrow 2 3 / 6 - 4 2$ f) Give an example of a graph that is neither Eulerian nor Hamiltonian. g) What is meaning of cut vertex?	(5 Marks) CO2
Q2.	Attempt any 2 out of 4. (5 marks each) a) Find the Adjacency Matrix and Incident Matrix of the following graph. 	(10 Marks) CO3

b) Check Whether following two graphs are isomorphic or Not?



c) Solve the travelling salesman problem for the following graph



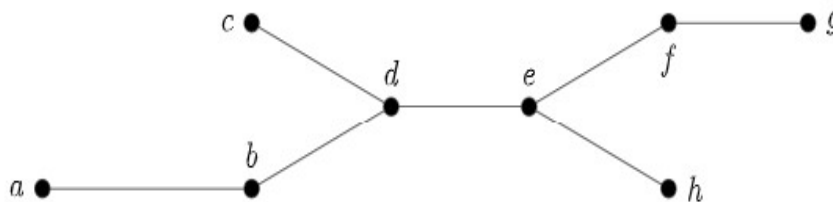
d) Prove that in any graph the number of vertices with odd degree are always even.

Q.3 Attempt all questions- (5 marks each)

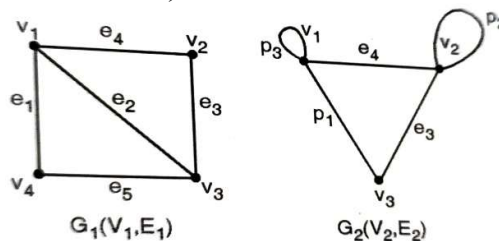
(10 Marks)

CO4

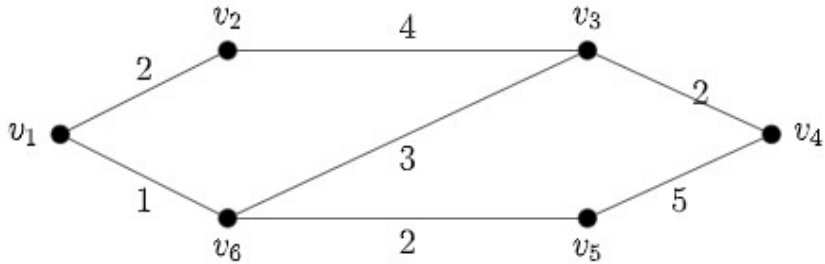
a) Find centre, radius and diameter of the following tree.



b) Find the union, intersection of the following two graph.



OR

Q.3	Attempt the question (10 Marks) Using Dijkstra's algorithm find the shortest path from vertex 'a' to all other vertices in the following graph 	CO4
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