

CDOE
BACHELOR OF COMPUTER APPLICATIONS (CBCS-2019 COURSE)
B.C.A. SEM - V : WINTER :- 2021
SUBJECT: GRAPH THEORY

Day : Friday
Date 25-02-2022

W-21890-2021

Time : 02:00 PM-05:00 PM
Max. Marks: 60

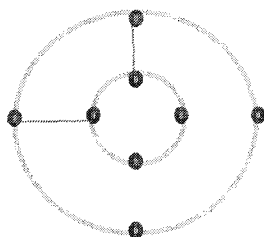
N.B.

- 1) Q.No. 4 from Section I is **COMPULSORY**.
- 2) Answer **ANY TWO** questions from Q.1,2,3 in Section – I.
- 3) Answer **ANY TWO** questions from Q.5,6,7 in Section – II.
- 4) All questions carry **EQUAL** marks.
- 5) Answer to both the sections should be written in **SAME** answer book.
- 6) Draw a labeled diagram **WHEREVER** necessary.

SECTION – I

Q.1 Answer the following : (6 marks x 2 = 12 marks)

- a) Write and explain working of Warshall's algorithm to find the shortest path.
- b) Are graph in the figure below is isomorphic? Why?

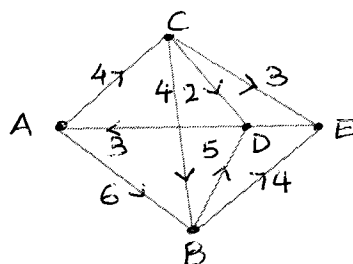


Q.2 Answer the following : (6 marks x 2 = 12 marks)

- a) Explain Hamiltonian and Eulerian graphs with suitable example.
- b) Write and discuss 'Huffman's Algorithm'.

Q.3 Answer the following : (6 marks x 2 = 12 marks)

- a) In the graph given below, capacity is given along each edge. Find the value of maximum flow from A to B in the network.



- b) Define 'Planar graph'. Check whether $K_{2,3}$ is a planar graph.

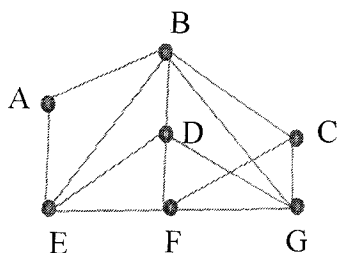
Q.4 Write short notes on **ANY THREE** of the following : (4 marks x 3 = 12 marks)

- a) Applications of Graph Coloring
- b) Fleury's Algorithm
- c) Puzzle problem
- d) Representation of Graph in Computer Memory

SECTION – II

Q.5 Answer the following : (6 marks x 2 = 12 marks)

- a) Apply a Depth-First-Search (DFS) algorithm to explore all the vertices starting from the vertex A.



- b) Illustrate step by step execution of the Breath First Search(BFS).

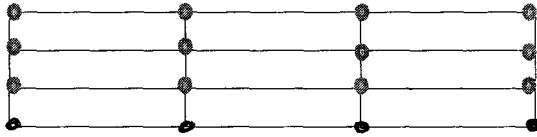
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Q.6 Answer the following : (6 marks x 2 = 12 marks)

- a) Draw two 3-regular graphs with eight vertices.
- b) Define and discuss 'Travelling Salesman Problem'.

Q.7 Answer the following : (6 marks x 2 = 12 marks)

- a) Find the minimum number of colors needs to paint the graph shown below.



- b) Define tree, binary tree, and complete binary tree with the help of suitable example.
