B.C.A. (2010 Course Sem- III : SUMMER - 2019

SUBJECT: MATHEMATICS – III (GRAPH THEORY)

Day: Friday
Date: 03/05/2019

S-2019-2097

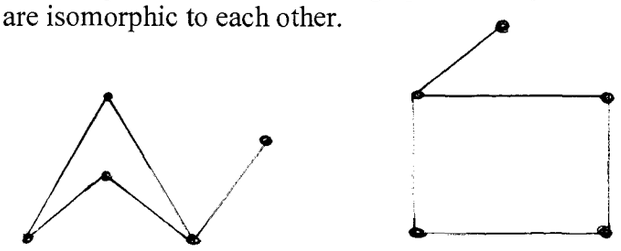
Time: 02.00 PM TO 05.00 PM
Max. Marks: 70

N.B.:

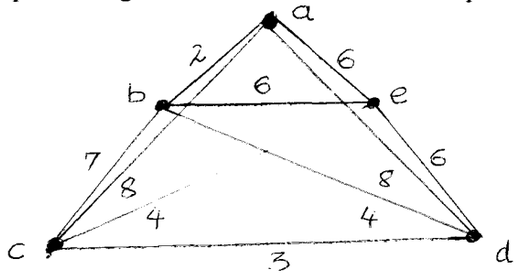
1) **Q. No. 1** is **COMPULSORY**.
2) Attempt any **FOUR** questions from **Q. No. 2 to Q. No. 7.**
3) Figures to the right indicate **FULL** marks.

Q.1 **a)** Define the following terms with examples: **(07)**
i) Hamilton Graph
ii) Eulerian Circuits

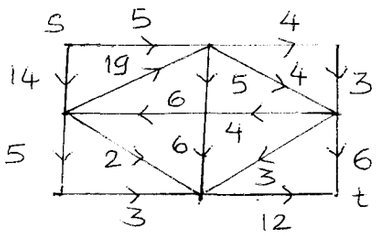
b) Define 'Isomorphism' between two graphs. Verify whether the following graphs are isomorphic to each other. **(07)**



Q.2 Describe prim's algorithm and find Minimum Spanning Tree for graph given below: **(14)**



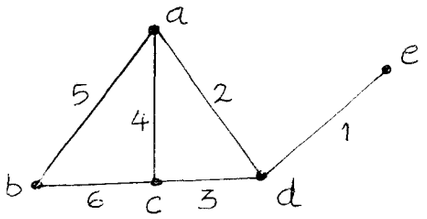
Q.3 Discuss 'Maximum Network flow' and find a maximum flow from s to t. **(14)**



Q.4 Define concept 'Coloring of Graph' and describe Appel and Haken Algorithm. **(14)**

Q.5 **a)** What is meant by spanning trees? **(07)**

b) Sketch all spanning trees of the given graph. **(07)**



P. T. O.

Q.6 **a)** Discuss 'Degree of graph' with suitable example. **(07)**

b) Draw digraph G corresponding to adjacent matrix. **(07)**

$$A = \begin{array}{c} \\ v_1 \\ v_2 \\ v_3 \\ v_4 \end{array} \begin{array}{c} \begin{array}{cccc} v_1 & v_2 & v_3 & v_4 \end{array} \\ \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ 1 & 0 & 0 & 1 \end{bmatrix} \end{array}$$

Q.7 Write short notes on any **TWO** of the following: **(14)**

a) Merge Algorithm

b) Depth First Search Algorithm

c) Chromatic Number

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