

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

M.A./M.Sc. FOURTH SEMESTER EXAMINATION, MAY 2023

SECOND YEAR (BATCH 2021-23)

MATHEMATICS

Paper : CC17

Date : 15/05/2023

Time : 11.00 am – 1.00 pm

Full Marks : 50

Answer all the question, maximum you can score 50. [All the symbols have their usual meaning.]

1. Find the length of the shortest paths from vertex 'a' to every other vertices by Dijkstra's algorithm for the graph: [10]

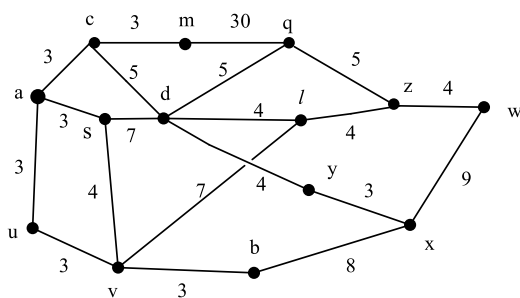


Fig : 1

2. Find the maximal flow and corresponding minimum cut for the s-t network: [10]

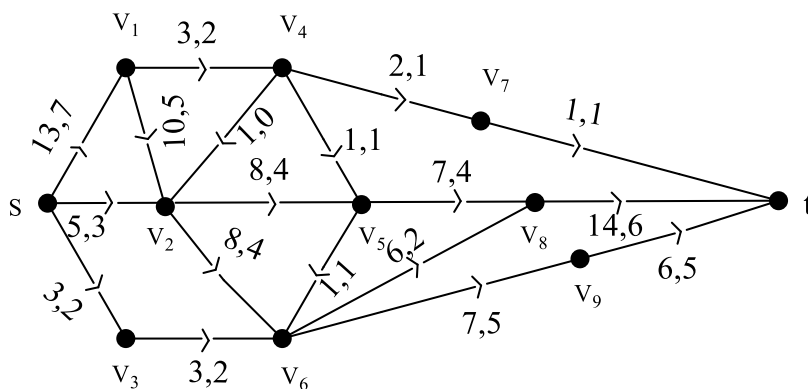
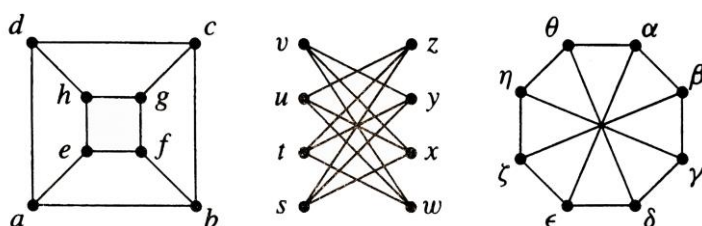


Fig : 2

3. Use Kruskal's algorithm to find Minimum spanning tree of the graph in Fig 1 using 'a' as root. [8]
4. Use Prim's Algorithm to find Minimum spanning tree of the graph in Fig 1 using 'a' as root. [8]
5. Determine which pairs of graph below are isomorphic : [12]



6. Which of the following are graphic ?

a) (6,6,5,4,3,3,2,2,1)

b) (6,5,5,4,3,3,3,2,1)

[2+2]

7. A graph G with n vertices is isomorphic to $\bar{G}$. Prove that $\frac{n(n-1)}{2}$ is even integer. [4]
8. Prove that K_4 is planar and K_5 is not planar. [4]

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