

F.Y.B.SC. (COMPUTER SCIENCE) SEM -II (2014 COURSE) :
SUMMER - 2018
SUBJECT: GRAPH THEORY

Day: **Wednesday**
 Date: **18/04/2018**

Time: **03.00 PM TO 05.00 PM**
 Max. Marks: 40

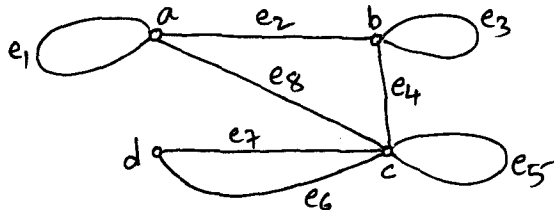
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N.B.:

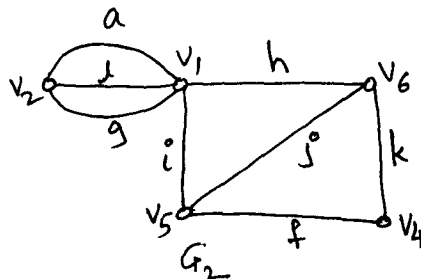
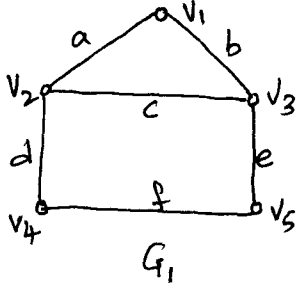
- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat and labeled diagrams **WHEREVER** necessary.

Q.1 Attempt any **TWO** of the following: **(10)**

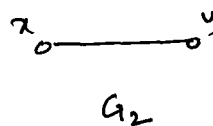
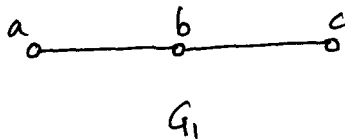
- a) Find the adjacency matrix and incidence matrix for the following graph.



- b) Find $G_1 \cap G_2$, $G_1 \cup G_2$ and $G_1 \oplus G_2$ for the following graphs G_1 and G_2 .

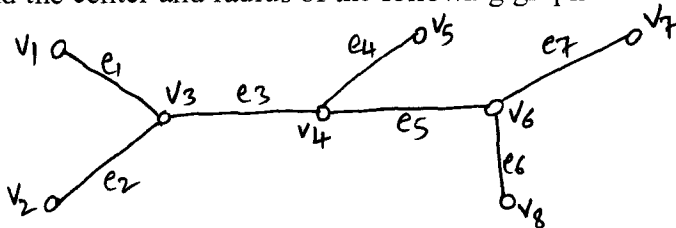


- c) Find the product of following two graphs.

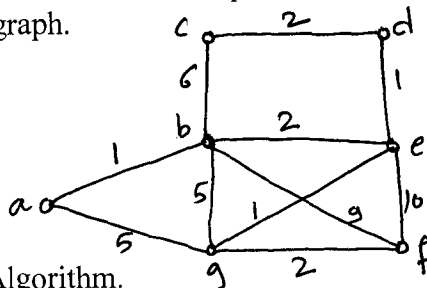


Q.2 Attempt any **TWO** of the following: **(10)**

- a) Find the center and radius of the following graphs.



- b) By using Dijkstra's algorithm find the shortest path between the vertices a and f in the following weighted graph.

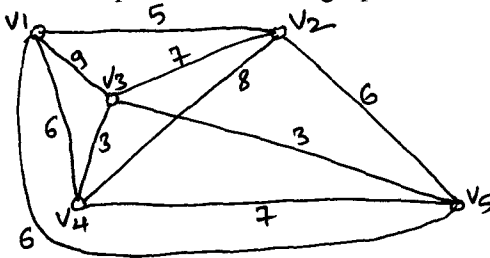


- c) Write the steps of Fleury's Algorithm.

P. T. O.

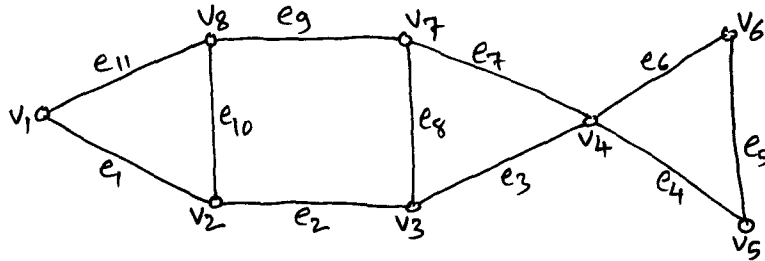
Q.3 Attempt any **TWO** of the following: **(10)**

a) Solve the travelling salesman problem for the graph below:



b) Prove that $r \leq d \leq 2r$, where r is radius and d is diameter of the tree.

c) Draw at least five spanning trees of the following graph.

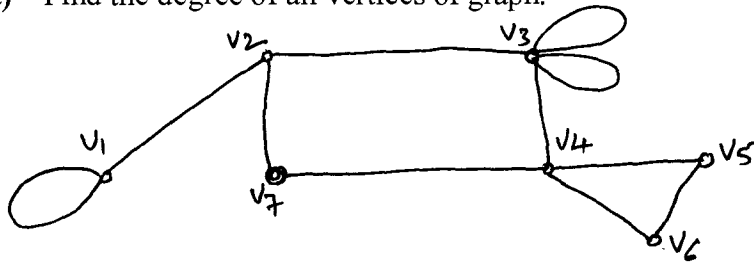


Q.4 Attempt any **FIVE** of the following: **(10)**

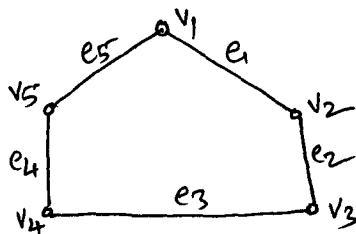
a) Draw the complete bipartite graph $K_{3,3}$ and $K_{2,4}$.

b) Define Regular graph with an example.

c) Find the degree of all vertices of graph.



d) Draw any four subgraphs of the following graphs.



e) Define isthmus and cut vertex.

f) Explain Hamiltonian graph and Hamiltonian path.

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