F.Y.B.SC. (COMPUTER SCIENCE) SEM –II (2014 COURSE) :
WINTER - 2017
SUBJECT: GRAPH THEORY

Day: Monday
Date: 30/10/2017

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

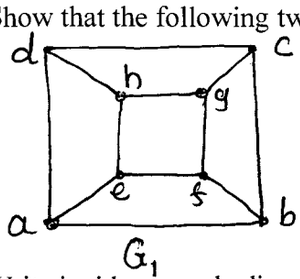
W-2017-0738

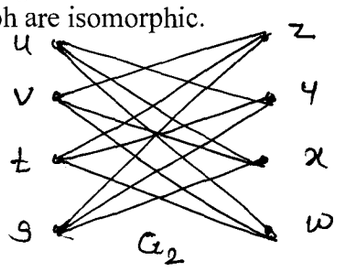
N.B.:

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

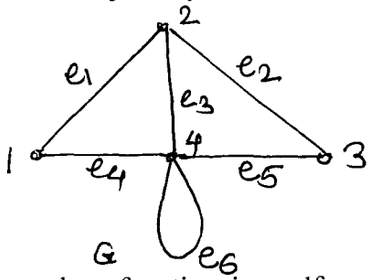
Q.1 Attempt any **TWO** of the following: **(10)**

a) Show that the following two graph are isomorphic.





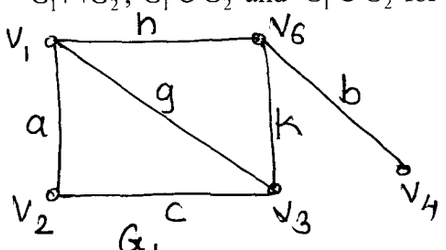
b) Write incidence and adjacency matrix of the following graph.

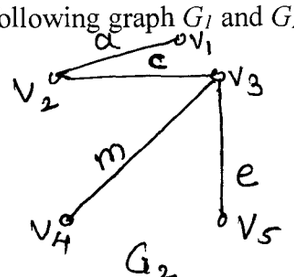


c) Prove that the number of vertices in a self –complementary graph is of the type 4k or 4k+1; where k is a positive integer.

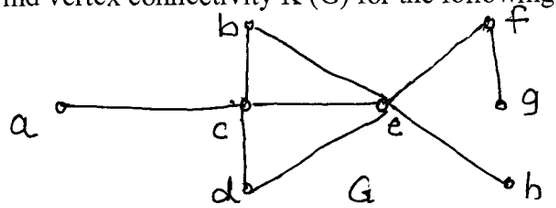
Q.2 Attempt any **TWO** of the following: **(10)**

a) Find:
$G_1 \cap G_2$, $G_1 \cup G_2$ and $G_1 \oplus G_2$ for the following graph G_1 and G_2.

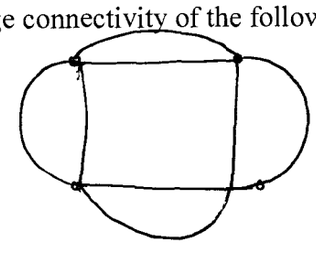




b) i) Find vertex connectivity K (G) for the following graph.



ii) Find the edge connectivity of the following graph G.

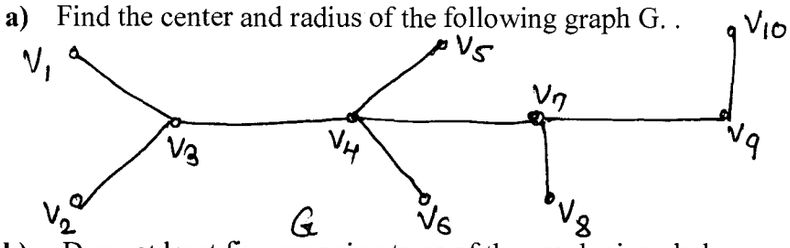


P. T. O.

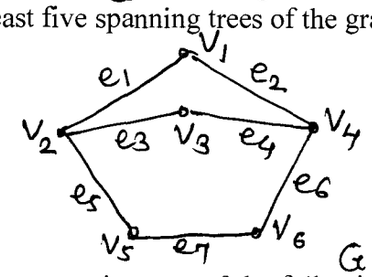
c) Explain Konigsberg seven Bridge problem in brief.

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

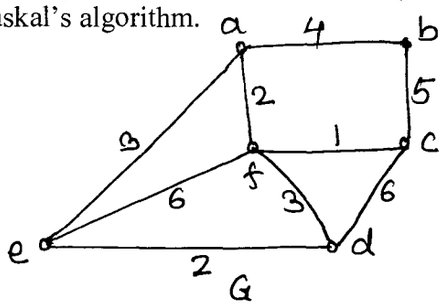
a) Find the center and radius of the following graph G. .



b) Draw at least five spanning trees of the graph given below:



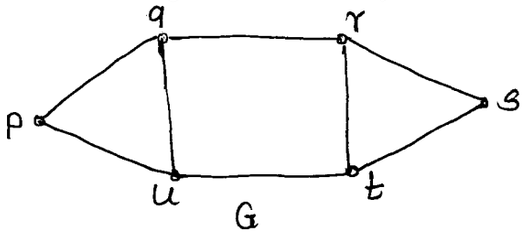
c) Find shortest spanning tree of the following weighted graph and weight of it using Kruskal's algorithm.



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

a) Draw the following graph:
i) 3 regular graph with 6 vertices ii) Star of outside 5 vertices.

b) State Hand Shaking lemma and verify it for the following graph.



c) Define complete graph with an example.

d) Define:
i) Isthmus ii) Cut vertex

e) Can you draw a binary tree on 7 vertices and height 2? Justify.

f) Define self- complementary graph with an example.

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