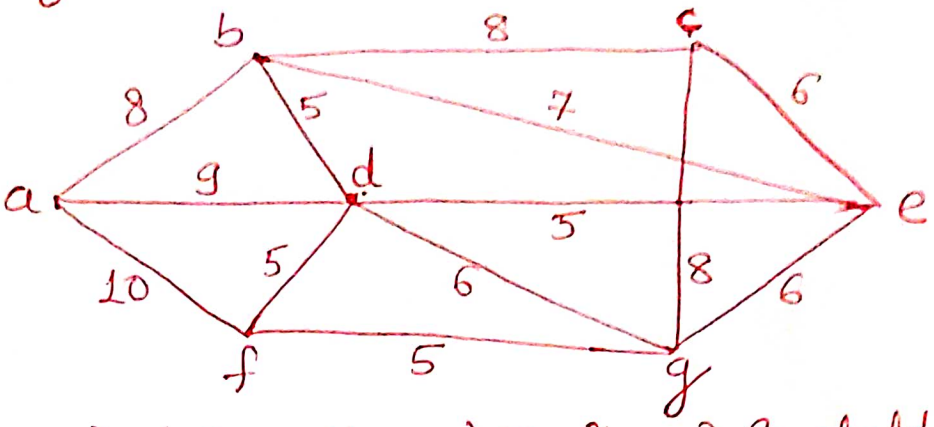
Assignment-2.

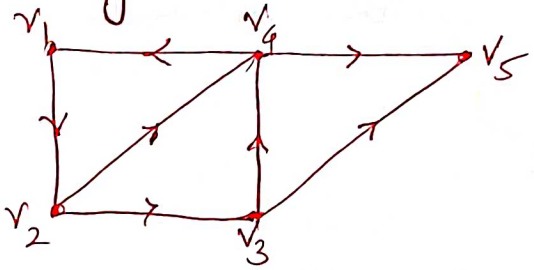
Q1 Apply Prim's Algorithm to construct a minimal Spanning tree for the weighted graph given below:



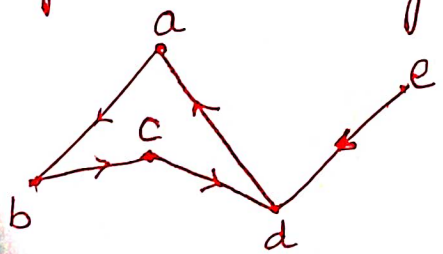
Q2. Define: a) Null graph b) Trail c) Reachable node d) Tree e) Height of the tree f) Radius of a graph

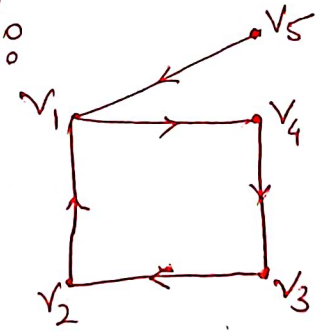
Q3. Define: i) Diagraph ii) Path iii) Cycle iv) Euler path v) Forest.

Q4. Find indegree & outdegree of each node of the graph given below & give all elementary cycles of this graph



Q5. Define isomorphic graphs. Show that following ~~two~~ graphs are isomorphic:





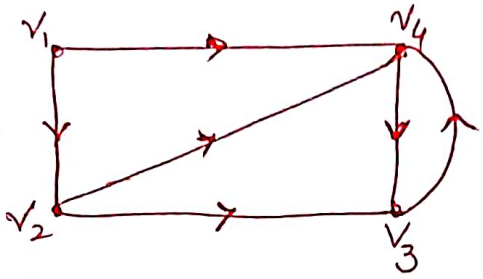
Q6. Draw tree representation for the tree given by $R = \{(1,2),(1,3),(1,4),(2,5),(4,6)(4,7)\}$ on set $A = \{1,2,3,4,5,6,7\}$ & draw corresponding binary tree.

Q7 Draw a directed tree with two nodes at level 1, five nodes at level 2, three nodes at level 3. Obtain the corresponding binary tree.

Q8. Draw a diagraph corresponding to the adjacency matrix $A = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \\ 1 & 1 & 0 & 1 \\ 1 & 0 & 0 & 0 \end{bmatrix}$ & interpret the results

AA^T, A^TA, A^2, A^3, A^4.

Q9. Give three different elementary paths from V_1 to V_3 for the diagraph given below. What is the shortest distance between V_1 & V_3? Is there any cycle in the graph?



Q10. Draw the digraphs corresponding to adjacency matrices:

$$A = \begin{bmatrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 \\ 1 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \end{bmatrix}, \quad B = \begin{bmatrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 1 \\ 1 & 1 & 1 & 0 \end{bmatrix}$$

Prove that diagraphs of A & B are isomorphic.

Q11. Represent the following algebraic expressions using binary tree:

(i) $(x+(y+z)) - (a \times (b+c))$

(ii) $(2x+(3-4x)) + (x-(3 \times 11))$

Q12. Find the minimum number of students in a class to be sure that four of them are born in the same month.