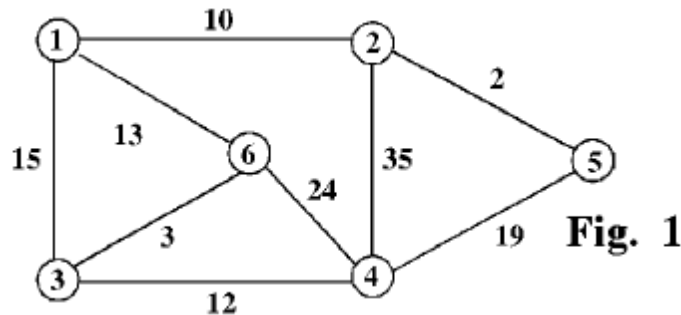
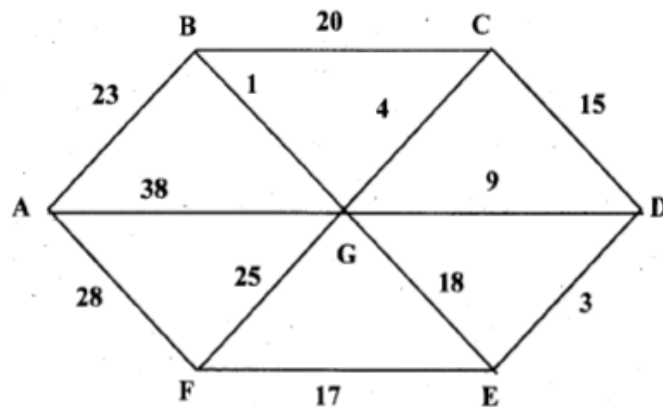


UNIT 4: GRAPH

1. Obtain minimum cost spanning tree for the following graph using Kruskal's algorithm.

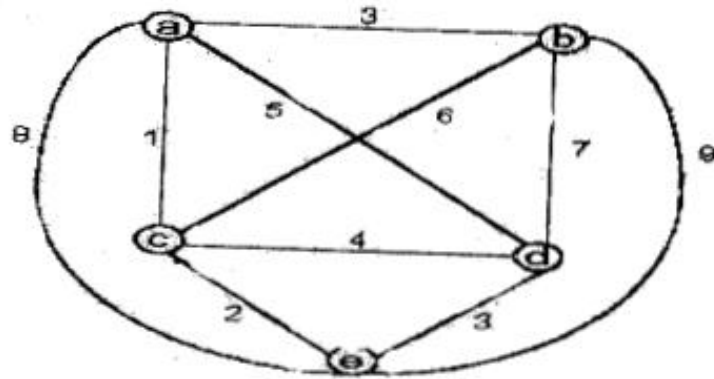


2. Write Floyd-Warshal algorithm to find shortest path between any two vertices of a graph. Explain the algorithm briefly.
3. Write an algorithm to test whether a graph is connected or not.
4. Write an algorithm to count number of connected components in a graph. Explain with example.
5. Consider the following directed graph.

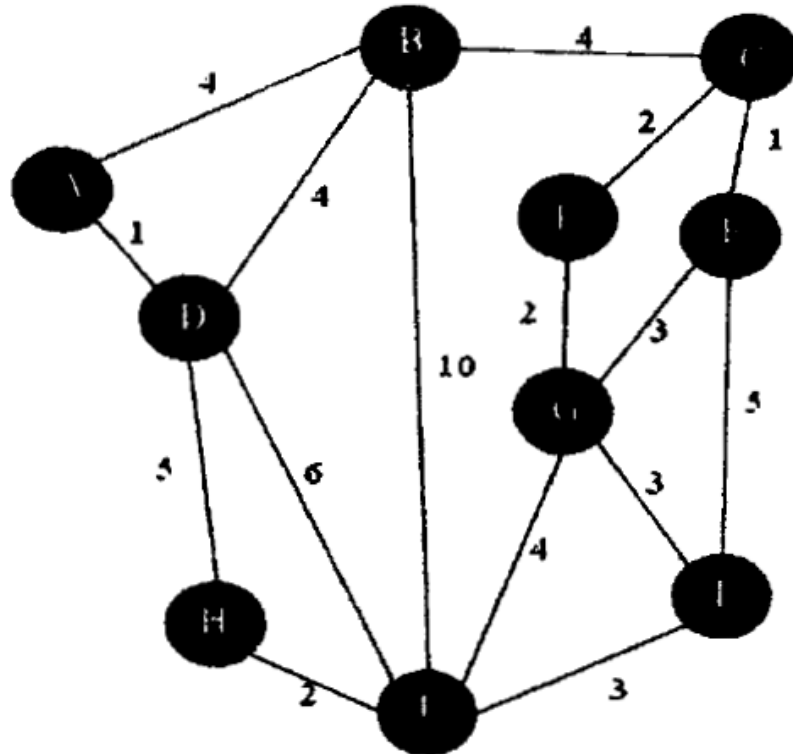


- (i) Find the Adjacency list representation of the graph.
 - (ii) Find a minimum cost spanning tree by Kruskal's algorithm.
6. When does a graph become a tree?
 7. Prove that the number of odd degree vertices in a connected graph should be even.
 8. Define simple graph, cyclic & acyclic graph with example.

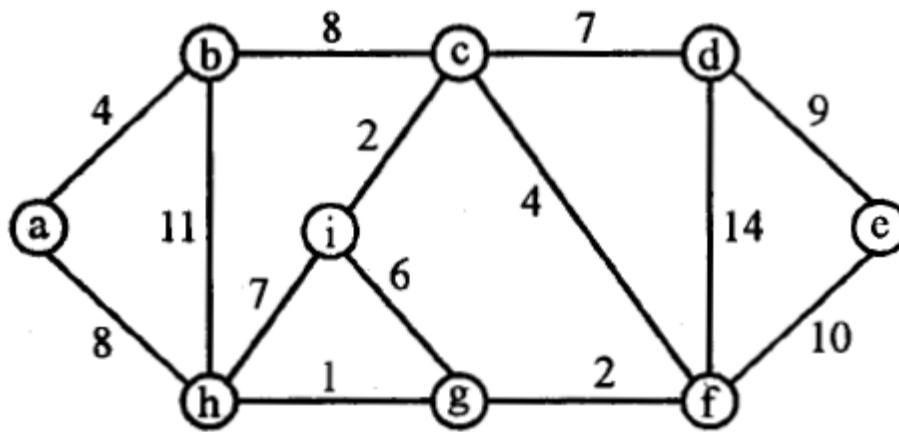
9. Discuss Prim's and Kruskal's algorithm. Construct minimum spanning tree for the below given graph using Prim's algorithm (Source node = a)



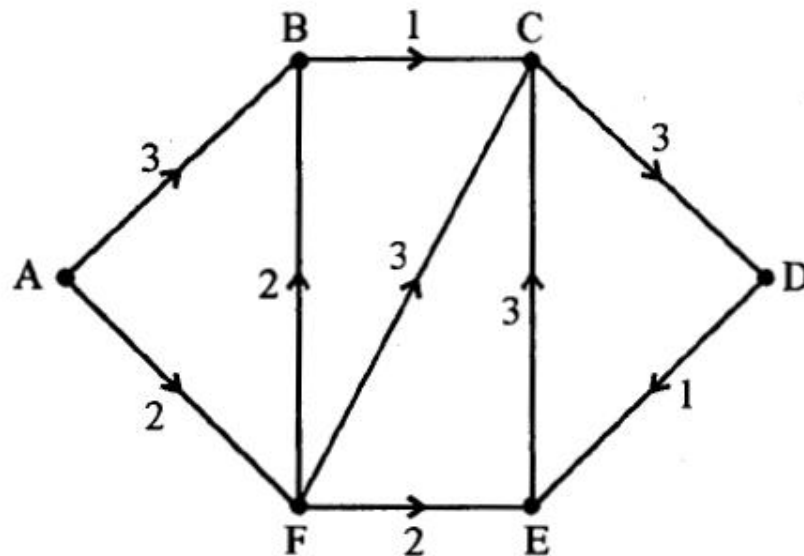
10. Find the minimum spanning tree for the following graph using Prim's and Kruskal's algorithm.



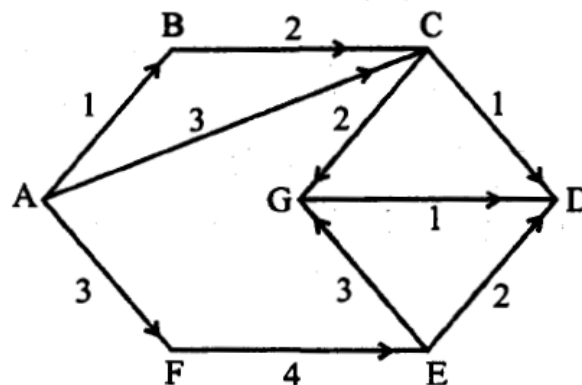
11. Write and explain an algorithm for finding shortest path between any two nodes of a given graph.
12. Describe the various representation of graph.
13. Find the minimum spanning tree of the following graph by Prim's algorithm and compute the value of MST.



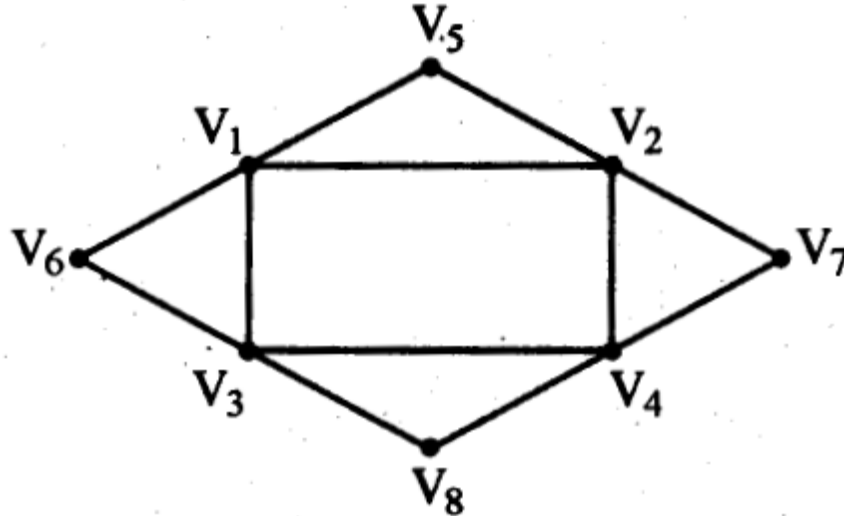
14. Define connected component in a graph and write pseudo code to find the connected components of a graph with example.
15. Apply Dijkstra's algorithm to find shortest path between node A & D.



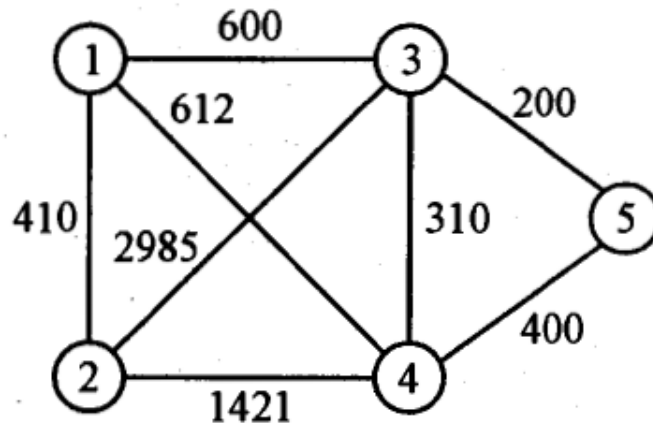
16. Show all steps to traverse the following graph by Breadth First Search. Start from node A.



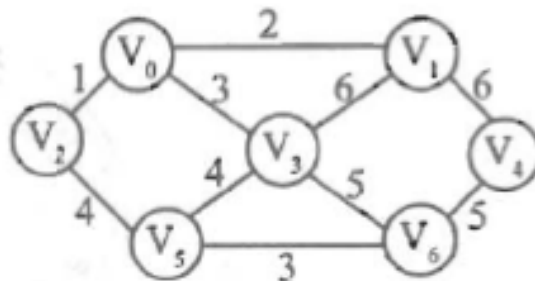
17. What is a graph? Differentiate between undirected and directed graph.
18. Explain the representation of the following graph by adjacency matrix and compare it with its linked-adjacency list representation.



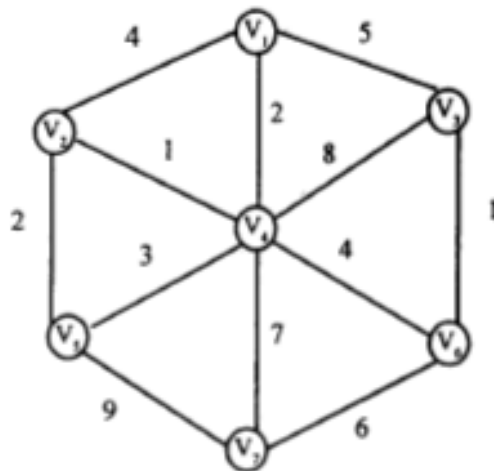
19. What is minimum spanning tree? What are the methods to get a MST from the graph? Convert the given graph with weighted edges to minimal spanning tree.



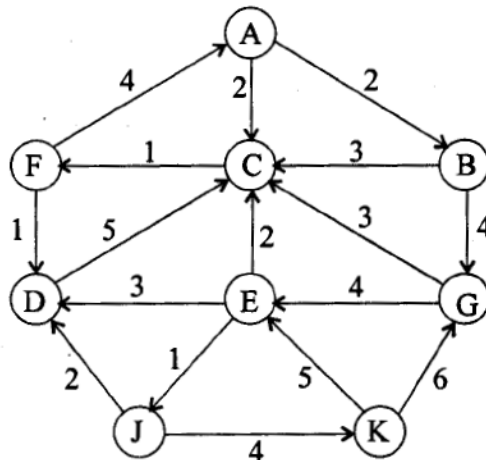
20. Write and explain Breadth First Search and Depth First Search Traversal algorithm with suitable example.
21. Define the spanning tree? Write the Prim's algorithm to find the minimum cost spanning tree of the following graph:



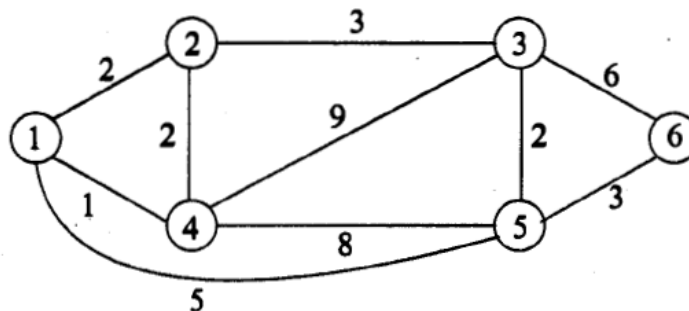
22. Find the minimum cost spanning tree using Prim's algorithm for the given graph.



23. Consider the following directed graph. Find the minimum cost spanning tree using Kruskal's algorithm.

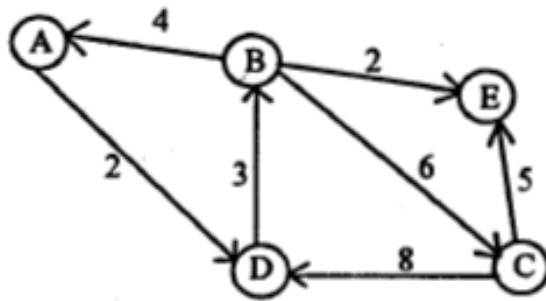


24. Using Dijkstra's algorithm, find out a shortest path from node 1 to node 6 for the graph given below.

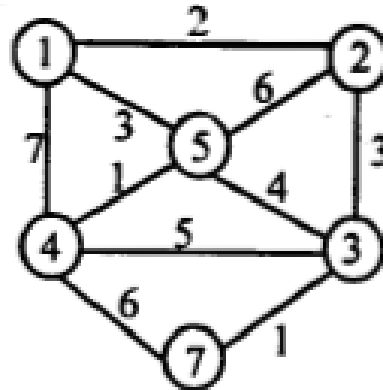


25. Define complete graph and connected graph.

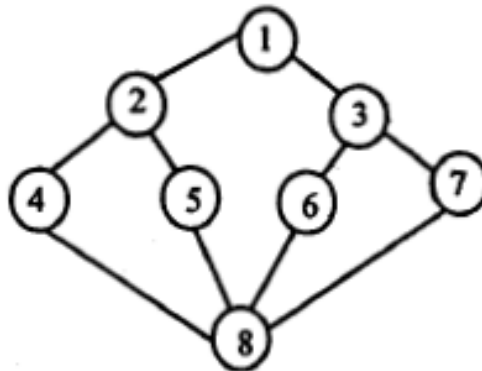
26. Write Floyd-Warshall algorithm for all pair shortest path and find the all pair shortest paths for the graph given below.



27. Use Prim's algorithm to determine MST for the graph given below.

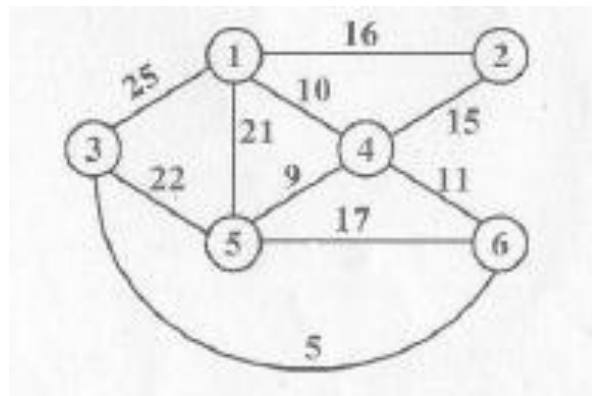


28. Consider the graph given below:

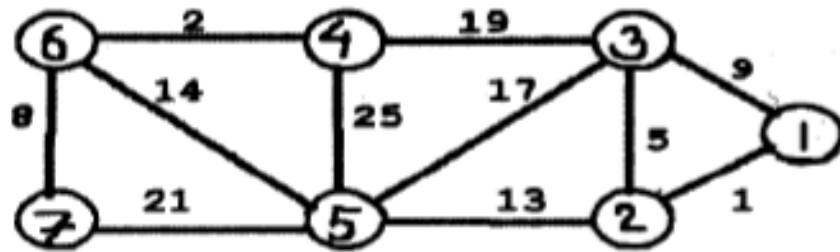


Perform BFS beginning at vertex 1. List the vertices in which they are visited.

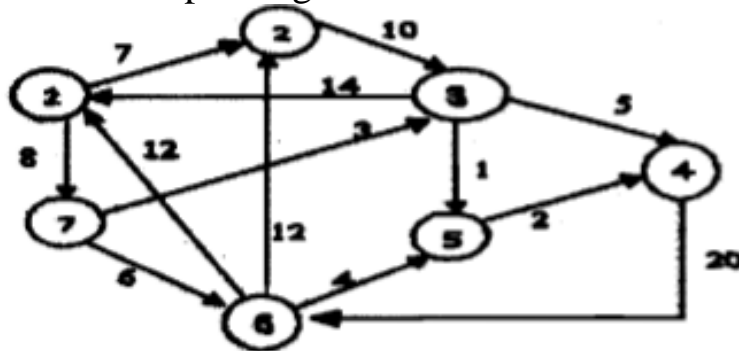
29. Use Kruskal's algorithm to determine the minimum spanning tree of the graph given below.



30. Define spanning tree. Find the minimal spanning tree for the following graph using Prim's algorithm.

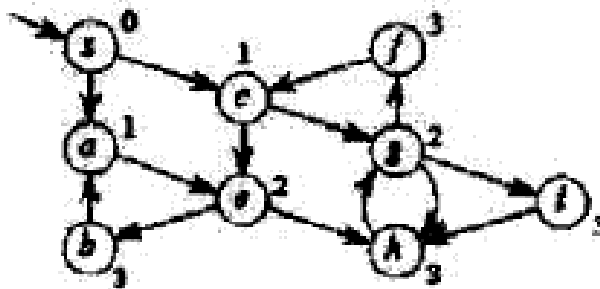


31. Find out the shortest path from node 1 to node 4 in the given graph using Dijkstra's shortest path algorithm.

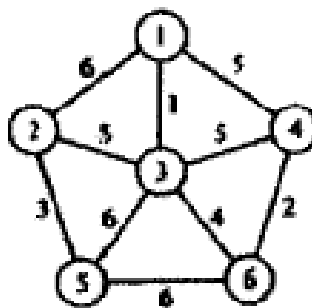


32. Write DFS algorithm to traverse a graph. Apply the same algorithm for the graph given in Q 31 by considering node 1 as the starting node.

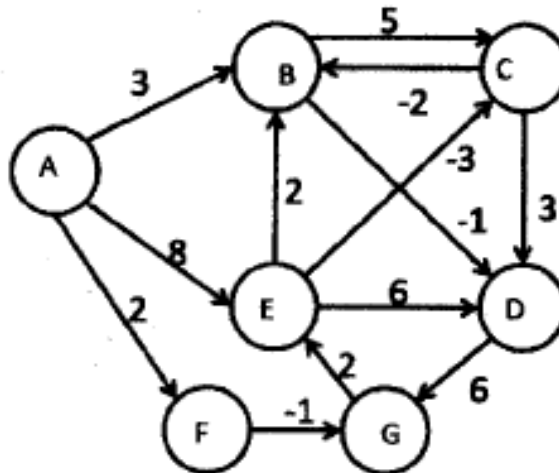
33. For the given graph, give adjacency list, storage representation for adjacency list and edge list.



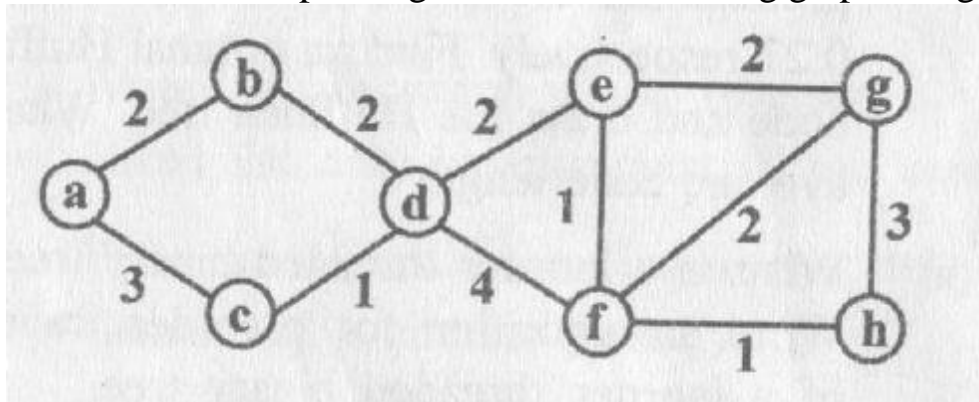
34. Find MST for the following graph using Kruskal's algorithm



35. Find the single source shortest path from the following graph using Dijkstra's algorithm



36. Find the minimal cost spanning tree for the following graph using



- i. Prim's algorithm
- ii. Kruskal's algorithm

Further give the adjacency matrix representation of the graph.

37. Write a short note on topological sorting.