

UNIT V

1. What is a graph?

A graph consists of a set of vertices V and set of edges E which is mathematically represented as $G=(V,E)$. Each edge is a pair (V,W) where V,W , belongs to E , edges are sometimes referred to as arcs.

2. What are Directed graphs?

If a pair of vertices for any edge is ordered, then that graph is called as Digraph or directed graph.

3. Define Path.

A path in a graph is a sequence of vertices $w_1, w_2, w_3, \dots, w_N$ such that W_i, W_{i+1} belongs to E for a value $1 \leq i \leq N$. The length of such a path is the number of edges on the path, which is equal to $n-1$.

4. Define Cycle.

A cycle is a path in which the first and last vertices are the same.

5. Define Acyclic graph.

A graph with no cycles is called Acyclic graph. A directed graph with no Edges is called as a directed Acyclic graph (or) DAG. DAGS are used for Compiler Optimization process.

6. Define Connected graph.

A graph is said to be a weighted graph is connected if there is a path from every vertex to every other vertex. A directed graph with this property is called as strongly connected graph. If a directed graph is not strongly connected but the underline graph. Without direction is connected it is called as a weakly connected graph.

7. What are the conditions for a graph to become a tree?

- A graph is a tree if it has two properties. i. If it is a connected graph.
ii. There should not be any cycles in the graph.

8. Define a Weighted Graphgraph if every edge in the graph is assigned

some weight or value. The weight of the edge is a positive value that represents the cost of moving the edge or the distance between two vertices.

9. Give the types of representation of graphs.

1. Adjacency matrix
2. Adjacency linked list

10. What is a minimum spanning tree?

A minimum spanning tree of an undirected graph G is a tree formed from graph edges that connect all the vertices of G at lowest total cost.

11. Explain about Adjacency Matrix

Adjacency matrix consists of a $n*n$ matrix where n is the no. of vertices present. In the graph, this consists of values either 0 or 1.

12. What is a back edge?

The possibility of reaching an already marked vertex is indicated by a dashed line, in a graph is called as back edge.

13. What is a single source shortest path problem?

Given as an input, a weighted graph, $G = \langle V, E \rangle$ and a distinguished vertex „S as the source vertex. Single source shortest path problem finds the shortest weighted path from s to every other vertex in G.

14. Explain about Unweighted shortest path.

Single source shortest path finds the shortest path from the source to each and every vertex present in a unweighted graph. Here no cost is associated with the edges connecting the vertices. Always unit cost is associated with each edge.

15. Explain about Weighted shortest path

Single source shortest path finds the shortest path from the source to each and every vertex present in a weighted graph. In a weighted graph some cost is always associated with the edges connecting the vertices.

16. What are the methods to solve minimum spanning tree?

- a) Prim's algorithm
- b) Kruskal's algorithm

17. Explain briefly about Prim's algorithm

Prim's algorithm creates the spanning tree in various stages. At each stage, a node is picked as the root and an edge is added and thus the associated vertex along with it.

18. Define a depth first spanning tree.

The tree that is formulated by depth first search on a graph is called as depth first spanning tree. The depth first spanning tree consists of tree edges and back edges.

19. What is a tree edge?

Traversal from one vertex to the next vertex in a graph is called as a tree edge.