SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE – 35

DEPARTMENT OF COMPUTER SIENCE AND ENGINEERING (UG & PG)

First Year, 2ⁿᵈ Semester

2 Marks Question and Answer

Subject Code & Name: 19ITT102 & Data Structures and Algorithms

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UNIT – IV

GRAPHS

1. **Define Graph.**

A graph G consist of a nonempty set V which is a set of nodes of the graph, a set E which

is the set of edges of the graph, and a mapping from the set for edge E to a set of pairs of

elements of V. It can also be represented as G=(V, E).

2. **Define adjacent nodes.**

Any two nodes which are connected by an edge in a graph are called adjacent nodes. For

example, if an edge x ε E is associated with a pair of nodes (u,v) where u, v ε V, then we say
that the edge x connects the nodes u and v.

3. **What is a directed graph?**

A graph in which every edge is directed is called a directed graph.

4. **What is an undirected graph?**

A graph in which every edge is undirected is called a directed graph.

5. **What is a loop?**

An edge of a graph which connects to itself is called a loop or sling.

6. **What is a simple graph?**

A simple graph is a graph, which has not more than one edge between a pair of nodes than
such a graph is called a simple graph.

7. What is a weighted graph?

A graph in which weights are assigned to every edge is called a weighted graph.

8. Define outdegree of a graph?

In a directed graph, for any node v, the number of edges which have v as their initial node is called the out degree of the node v.

9. Define indegree of a graph?

In a directed graph, for any node v, the number of edges which have v as their terminal node is called the indegree of the node v.

10. Define path in a graph?

The path in a graph is the route taken to reach terminal node from a starting node.

11. What is a simple path?

A path in a diagram in which the edges are distinct is called a simple path. It is also called as edge simple.

12. What is a cycle or a circuit?

A path which originates and ends in the same node is called a cycle or circuit.

13. What is an acyclic graph?

A simple diagram which does not have any cycles is called an acyclic graph.

14. What is meant by strongly connected in a graph?

An undirected graph is connected, if there is a path from every vertex to every other vertex. A directed graph with this property is called strongly connected.

15. When is a graph said to be weakly connected?

When a directed graph is not strongly connected but the underlying graph is connected, then the graph is said to be weakly connected.

16.Name the different ways of representing a graph?

a.Adjacencymatrix

b. Adjacency list

17. What is an undirected acyclic graph?

When every edge in an acyclic graph is undirected, it is called an undirected acyclic graph. It is also called as undirected forest.

Data Structures and Algorithms

18. What are the two traversal strategies used in traversing a graph?

a.Breadthfirstsearch

b. Depth first search

19. What is a minimum spanning tree?

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

20. Name two algorithms two find minimum spanning tree

Kruskal'salgorithm

Prim's algorithm

21. Define graph traversals.

Traversing a graph is an efficient way to visit each vertex and edge exactly once.

22. List the two important key points of depth first search.

i) If path exists from one node to another node, walk across the edge – exploring the edge.

ii) If path does not exist from one specific node to any other node, return to the previous node where we have been before – backtracking.

23. What do you mean by breadth first search (BFS)?

BFS performs simultaneous explorations starting from a common point and spreading out independently.

24.**Differentiate BFS and DFS.**

No.	DFS	BFS
1.	Backtracking is possible from a dead end	Backtracking is not possible
2.	Vertices from which exploration is incomplete are processed in a	The vertices to be explored are organized as a
3.	Search is done in one particular direction	The vertices in the same level are maintained

25. **What do you mean by tree edge?**

If w is undiscovered at the time vw is explored, then vw is called a tree edge and v becomes the parent of w.

26. **What do you mean by back edge?**

If w is the ancestor of v, then vw is called a back edge.

27. Define biconnectivity.

A connected graph G is said to be biconnected, if it remains connected after removal of any one vertex and the edges that are incident upon that vertex. A connected graph is biconnected, if it has no articulation points.

28. What do you mean by articulation point?

If a graph is not biconnected, the vertices whose removal would disconnect the graph are known as articulation points.

29. What do you mean by shortest path?

A path having minimum weight between two vertices is known as shortest path, in which weight is always a positive number.

30. Define Activity node graph.

Activity node graphs represent a set of activities and scheduling constraints. Each node represents an activity (task), and an edge represents the next activity.

31. Define adjacency list.

Adjacency list is an array indexed by vertex number containing linked lists. Each node Vi the I th array entry contains a list with information on all edges of G that leave Vi. It is used to represent the graph related problems.