CS502 – Fundamentals of Algorithms

Important Macq's for Final Term

By

CS Experts

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1. Dijkstra's Algorithm is used to solve _____ problems.

a) All pair shortest path

b) Single source shortest path

c) Network flow d) Sorting

2. Which of the following is the most commonly used data structure for implementing Dijkstra's Algorithm?

a) Max priority queue

b) Stack

c) Circular queue

d) Min priority queue

3. What is the time complexity of Dijikstra's algorithm?

a) O(N)

b) $O(N_3)$

c) $O(N_2)$

d) O(logN)

- Please choose one

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4. Dijkstra's Algorithm cannot be applied on _____
   a) Directed and weighted graphs
   b) Graphs having negative weight function
   c) Unweighted graphs
   d) Undirected and unweighted graphs

5. How many priority queue operations are involved in Dijkstra's Algorithm?
   a) 1
   b) 3
   c) 2
   d) 4

6. How many times the insert and extract min operations are invoked per vertex?
   a) 1
   b) 2
   c) 3
   d) 0

7. The maximum number of times the decrease key operation performed in Dijkstra's algorithm will be equal to _____
   a) Total number of vertices
   b) Total number of edges
   c) Number of vertices – 1
   d) Number of edges – 1

8. What is running time of Dijkstra's algorithm using Binary min- heap method?
   a) O(V)
   b) O(VlogV)
   c) O(E)
   d) O(ElogV)

True False

- Please choose one

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9. The running time of Bellmann Ford algorithm is lower than that of Dijkstra's Algorithm.

a) True

b) False

10. Dijkstra's Algorithm run on a weighted, directed graph G={V,E} with non-negative weight function w and source s, terminates with d[u]=delta(s,u) for all vertices u in V.

a) True

b) False

11. Dijkstra's Algorithm is the prime example for _____

a) Greedy algorithm

b) Branch and bound

c) Back tracking

d) Dynamic programming

1. Computing the strongly connected components of a graph is a generalization of the problem to determine whether a digraph is strongly connected or not.

   True

2. If u finds yourself in maze the better traversal approach will be:

   BFS and DFS are valid

3. In ---------- algorithm, at any time, the subset of edges A forms a single tree.

   Prim's

True False

- Please choose one

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4. In computing the strongly connected components of a digraph, vertices of the digraph are not partitioned into subsets.

   False

5. Which is true statement:

   The breadth-first-search is a shortest-path algorithm that works on un-weighted graphs.

6. There are no ---------- edges in undirected graph.

   Cross

7. In undirected graph, by convention all the edges are called ---------- edges.

   Back

8. A digraph is strongly connected under what condition?

   A digraph is strongly connected if for every pair of vertices u, v ∈ V, u can reach v and vice versa.

9. The tricky part of the ---------- algorithm is how to detect whether the addition of an edge will create a cycle in viable set A.

   Kruskal's

10. Digraphs are not used in communication and transportation networks.

    True

11. If u and v are mutually reachable in G, then in the graph formed by reversing all the edges, these vertices are not reachable.

True False

- Please choose one

False

12. A topological sort of a DAG is a---------- ordering of the vertices of the DAG such that for each (u, v), u appears before v in the ordering.

Linear

13. Kruskal's algorithm works by adding vertices in increasing order of weight (lightest edge first).

False

14. Adding an edge to a free tree creates:

Cycle

15. Forward edge is:

(u, v) where v is a proper descendent of u in the tree

16. In strong components algorithm, vertices are sorted in ---------- order of finish times.

Decreasing

17. In Kruskal's algorithm the next edge is not added to viable set A, if it's adding Induce a cycle.

True

18. What is the time complexity to extract a vertex from priority queue in Prim's algorithm?

(log V)

19. A graph may contain----------.

True False

- Please choose one

More than one MST

20. Prim's algorithm builds MST by starting with any vertex and at any time the subset of edges form:

A single tree

21. In Prim's algorithm, we start with the---------- vertex r; it can be any vertex.

Root

22. The ---------- given by DFS allow us to determine whether the graph contains any cycles.

Time Stamps

23. You have an adjacency list for G, what is time complexity to compute Graph transpose G^T?

Θ (V + E)

24. Back edge is:

Ans. (u, v) where v is an ancestor of u in the tree

25. What algorithm technique is used in the implementation of Kruskal solution for the MST?

Ans. Greedy Technique (Pg. # 142)

26. If a subset of edges A is viable for building MST. It cannot contain a/an----------.

Ans. Cycle (Pg. # 143)

True False

- Please choose one

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27. Adding any edge to a free tree creates a unique----------

Ans. Cycle (Pg#142)

28. Prim's algorithm is based on -------- strategy.

Ans. Greedy (Pg. # 142)

29. In strong components algorithm, First of all DFS is run for getting ---------- times of vertices.

Ans. Finish

30. There exists a unique path between any two vertices of a free tree.

Ans. True (pg. # 142)

31. In strong components algorithm, first of all DFS is run for computing finish times of vertices.

Ans. true

32. There is relationship between number of back edges and number of cycle in DFS

Ans. there is no relationship between number of back edges and number of cycles

33. In Prim's algorithm at any time, the subset of edges A forms a single forest.

Ans. False (pg#149)

34. In Kruskal's algorithm at any time, the subset of edges A forms a single tree.

True False

- Please choose one

Ans. False (pg#149)

35. Kruskal's algorithm works by adding ---------- in increasing order of weight (lightest edge first).

Ans. edges (Pg. # 147)

36. In Prims algorithm we will make use of priority----------.

Ans. queue (pg. # 150)

37. Cross edge is :

Ans. (u, v) where u and v are not ancestor or descendent of one another

38. The ancestor and descendent relation cannot be inferred by the parenthesis Lemma.

Ans. False (Pg. # 129)

39. In Kruskal's algorithm, the next ---------- is not added to viable set A, if it's adding induce a/an cycle.

Ans. edge (Pg. # 147)

40. Equivalence relation partitions the vertices into ---------- classes of mutually reachable vertices and these are the strong components.

Ans. Equivalence (Pg#136)

41. For undirected graph, there is no distinction between forward and back edges.

Ans. True (Pg#130)

True False

- Please choose one

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42. In strong components algorithm, the form of graph is used in which all the ---------- of original graph G have been reversed in direction.

Ans. edges (Pg. # 138)

43. Networks are complete in the sense that it is not possible from any location in the network to reach any other location in the digraph.

Ans. True (Pg#135)

44. In digraph G = (V, E) ; G has cycle if and only if:

Ans. The DFS forest has a back edge (Pg. # 131)

45. As the Kruskal's algorithm runs the edges in viable set A induce a ---------- on the vertices.

Ans. Forest (Pg#147)

46. Timestamp structure of ---------- is used in determining the strong components of a digraph.

Ans. Both DFS and BFS

47. In Prim's algorithm, we start with the _____ vertex r; it can be any vertex.

Root

48. In Prim's algorithm, at any time, the subset of edges A forms a single _____.

Tree

True False

- Please choose one

---

49. Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree edge) when the graph has relatively few edges.

    True

50. There is relationship between number of back edges and number of cycles in DFS

    There is no relationship between back edges and number of cycles.

51. In Prim's algorithm, we will make use of priority _____.

    Queue

52. We say that two vertices u and v are mutually not reachable if u can reach v and vice versa.

    False

53. In strong components algorithm, the form of graph is used in which all the vertices of original graph G have been reversed in direction.

    False

54. In Timestamped DFS-cycles lemma, if edge (u, v) is a back edge, then _____

    f[u]⩽f[v]

55. There exist a unique path between any _____ vertices of a free tree.

True False

- Please choose one

Two

56. In strong components algorithm, vertices are sorted in_____ order of finish times.

Decreasing

57. According to parenthesis lemma, vertex u is unrelated to v vertex if and only if d[u],f[u]] and [d[v],f[v]] are disjoint.

True

58. A digraph is strongly connected under what condition?

A digraph is strongly connected if for every pair of vertices u, v e V, u can reach v and vice versa.

59. The tricky part of the _____ algorithm is how to detect whether the addition of an edge will create a cycle in viable set A.

Kruskal's

60. If a subset of edges A is viable for building MST, it can not contain a/an _____.

Cycle

61. Digraphs are not used in communication and transportation networks.

True

62. A strongly connected component only apply to:

True False

- Please choose one

Directed Graph

63. According to parenthesis lemma, vertex u is a descendent of v vertex if and only if;

[d[u], f[u]] ⊆ [d[v], f[v]

64. What is the time complexity to extract a vertex from the priority queue in Prim's algorithm?

(log V)

65. Back edge is:

(u, v) where v is an ancestor of u in the tree.

66. In computing the strongly connected components of a digraph, vertices of the digraph are not partitioned into subsets.

False

67. In Timestamped DFS-cycles lemma, if edge (u, v) is a tree, forward or cross edge, then _____

f[u]⩾f[v]

68. In Kruskal's algorithm, the next edge is added to viable set A, if its adding does not induce a/an _____ .

Cycle

69. In Generic approach determining of Greedy MST, we maintain a subset A of _____ .

Edges

True False

- Please choose one

---

70. If u and v are mutually reachable in G, then in the graph formed by reversing all the edges, these vertices are not reachable.

    False

71. Kruskal's algorithm works by adding _____ in increasing order of weight (lightest edge first).

    Edges

72. In Kruskal's algorithm, the next _____ is not added to viable set A, if its adding induce a/an cycle.

    Edge

73. Networks are complete in the sense that it is possible from any location in the network to reach any other location in the digraph.

    True

74. In Generic approach determining of Greedy MST, we maintain a subset A of _____ .

    Edges

75. There exist a unique path between any _____ vertices of a free tree.

    Two

76. What is the time complexity to extract a vertex from the priority queue in Prim's algorithm?

    log (V)

True False

- Please choose one

---

77. The time stamps given by DFS do not allow us to determine whether the graph contains any cycles.

False

78. Timestamp structure of _____ is used in determining the strong components of a digraph.

Both DFS & BFS

79. In Kruskal's algorithm, the next edge is not added to viable set A, if its adding induce a cycle.

False

80. A topological sort of a DAG is a _____ ordering of the vertices of the DAG such that for each edge (u, v), u appears before v in the ordering.

Linear

81. In Kruskal's algorithm, at any time, the subset of edges A forms a single tree.

False

82. Adding any edge to a free tree creates a unique cycle.

True

83. In digraph G=(V,E) ;G has cycle if and only if The DFS forest has back edge

Cycle

84. In undirected graph, by convention all the edges are called _____ edges.

True False

- Please choose one

Back

85. Prim’s algorithm is based on ---------- strategy.

Greedy

86. There are no _____ edges in undirected graph.

Cross

87. You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T ?

(V+E)

Which is true statement in the following.

Kruskal algorithm is multiple source technique for finding MST.

Kruskal's algorithm is used to find minimum spanning tree of a graph, time complexity of this algorithm is O(EV)

Both of above

Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best Tree edge) when the graph has relatively few edges) (Right Answer)

The relationship between number of back edges and number of cycles in DFS is,

Both are equal

Back edges are half of cycles

Back edges are one quarter of cycles

There is no relationship between no. of edges and cycles (Right Answer)

Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree

edge) when the graph has relatively few edges.

True (Right Answer)
False

What is the time complexity to extract a vertex from the priority queue in Prim's

algorithm?

True False

- Please choose one

Select correct option:

log (V)
V.V

E.E

log (E)

Suppose that a graph G = (V,E) is implemented using adjacency lists. What is the complexity of a breadth-first traversal of G?

Select correct option:

O(|V |^2)

O(|V | |E|) (Right Answer)
O(|V |^2|E|)

O(|V | + |E|)

What is generally true of Adjacency List and Adjacency Matrix representations of graphs?

Select correct option:

Lists require less space than matrices but take longer to find the weight of an edge (v1,v2)

Lists require less space than matrices and they are faster to find the weight of an edge (v1, v2) Right Answer)
Lists require more space than matrices and they take longer to find the weight of an edge (v1, v2)

Lists require more space than matrices but are faster to find the weight of an edge (v1, v2)

What general property of the list indicates that the graph has an isolated vertex?

Select correct option:

There is Null pointer at the end of list.

The Isolated vertex is not handled in list. (not Sure)
Only one value is entered in the list.

There is at least one null list.

A dense undirected graph is:

Select correct option:

A graph in which E = O(V^2) (Right Answer)
A graph in which E = O(V)

A graph in which E = O(log V)

True False

- Please choose one

All items above may be used to characterize a dense undirected graph

In digraph G=(V,E) ;G has cycle if and only if

Select correct option:

The DFS forest has forward edge.

The DFS forest has back edge (Right Answer)
The DFS forest has both back and forward edge

BFS forest has forward edge

Back edge is:

Select correct option:

(u, v) where v is an ancestor of u in the tree. (Right Answer)
(u,v) where u is an ancesstor of v in the tree.

(u, v) where v is an predcessor of u in the tree.

None of above

There is no relationship between back edges and number of cycle(Right Answer)

You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T ?

Select correct option:

(V+E) (Right Answer)
V.E

V

E

Question # 3 of 10 (Start time: 06:54:27 PM) Total Marks: 1

You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T.?

?(V + E) Right Answer)
?(V E)

?(V)

?(V^2)

True False

- Please choose one

What is the time complexity to extract a vertex from the priority queue in Prim's algorithm?

Select correct option:

log (V) (Right Answer)
V.V

E.E

log (E)

Dijkstra's algorithm :

Select correct option:

Has greedy approach to find all shortest paths

Has both greedy and Dynamic approach to find all shortest paths

Has greedy approach to compute single source shortest paths to all other vertices (Right Answer)
Has both greedy and dynamic approach to compute single source shortest paths to all other vertices.

What algorithm technique is used in the implementation of Kruskal solution for the MST?

Greedy Technique (Right Answer)
Divide-and-Conquer Technique

Dynamic Programming Technique

The algorithm combines more than one of the above techniques

What is the time complexity to extract a vertex from the priority queue in Prim's algorithm?

Select correct option:

O (log E)

? (V)

? (V+E)

O (log V) (Right Answer)

1. What algorithm technique is used in the implementation of Kruskal solution for MST?

a) Greedy Technique page 142

True False

- Please choose one

b) Divide-and-Conquer Technique

c) Dynamic Programming Technique

d) The algorithm combines more than one of the above techniques i.e. Divide-and-Conquer and dynamic programing

1. There exists a unique path between any _____ vertices of a free tree.

a) One

b) Two page 142

c) Three

d) All

1. If a subset of edges A is viable for building MST, it cannot contain a/an _____

a) Vertex

b) Edge

c) Cycle page 143

d) Graph

1. As the Kruskal's runs, the edges in viable set A induce a _____ on the vertices.

a) Set

b) Graph

c) Tree

d) Forest

1. The _____ given by DFS allow us to determine whether the graph contains any cycles.

a) Order

b) Time stamps page 130

c) BFS traversing

d) Topological sort

1. The time stamps given by DFS do not allow determining whether the graph contains any cycles.

a) True

b) False page130

1. By breaking any edge on a cycle created in free tree, the free _____ is restored.

a) Edge

b) Tree

c) Cycle page 143

d) Vertex

1. Forward edge is

a) (u, v) where u is a proper descendent of v in the tree

b) (u, v) where v is a proper descendent of u in the tree page 129

True False

- Please choose one

c) (u, v) where v is a proper ancestor of u in the tree

d) (u, v) where u is a proper ancestor of v in the tree

1. In Kruskal's algorithm, the next _____ is not added to viable set A, if its adding induces a/an cycle.

a) Vertex

b) Edge page147

c) Cycle

d) Tree

1. In _____ algorithm, at any time, the subset of edges A forms a single tree

a) Kruskal's

b) Prim's page 149

c) Both

d) None

Question # 1 of 10 (Start time: 10:14:37 PM) Total Marks: 1
There exist a unique path between any _____ vertices of a free tree.
Select correct option:
One
Two Ans
Three
All

Question # 2 of 10 (Start time: 10:15:15 PM) Total Marks: 1
In _____ algorithm, at any time, the subset of edges A forms a single tree.
Select correct option:
Kruskal's
Prim's Ans
Both
None

Question # 3 of 10 (Start time: 10:15:56 PM) Total Marks: 1
A digraph is strongly connected under what condition?
Select correct option:
A digraph is strongly connected if for every pair of vertices u, v e V, u can reach v .
A digraph is strongly connected if for every pair of vertices u, v e V, u can reach v and vice versa. Ans
A digraph is strongly connected if for at least one pair of vertex u, v e V, u can reach v and vice versa.
A digraph is strongly connected if at least one third pair of vertices u, v e V, u can reach v and vice versa.

Question # 4 of 10 (Start time: 10:16:38 PM) Total Marks: 1
Digraphs are not used in communication and transportation networks.
Select correct option:

True False

- Please choose one

True

False Ans

Question # 5 of 10 (Start time: 10:17:31 PM) Total Marks: 1
There are no _____ edges in undirected graph.
Select correct option:
Forward
Back
Cross
Both forward and back Ans

Question # 6 of 10 (Start time: 10:17:53 PM) Total Marks: 1
In Kruskal's algorithm, at any time, the subset of edges A forms a single tree.
Select correct option:
True
False Ans

Question # 7 of 10 (Start time: 10:18:12 PM) Total Marks: 1
Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree edge) when the graph has relatively few edges.
Select correct option:
True
False Ans

Question # 8 of 10 (Start time: 10:18:54 PM) Total Marks: 1
The _____ given by DFS allow us to determine whether the graph contains any cycles.
Select correct option:
Order
Time stamps Ans
BFS traversing
Topological sort

Question # 9 of 10 (Start time: 10:19:41 PM) Total Marks: 1
Kruskal’s algorithm works by adding _____ in increasing order of weight (lightest edge first).
Select correct option:
Vertices
Edges Ans
Trees
Weights

Question # 10 of 10 (Start time: 10:20:15 PM) Total Marks: 1
Runtime complexity of Prim's algorithm is _____.
Select correct option:
V log V
E log V Ans
log V
None of the above

-

Question # 1 of 10 (Start time: 10:23:08 PM) Total Marks: 1
Adding any edge to a free tree creates a unique cycle.

True False

- Please choose one

Select correct option:

True
False

Question # 2 of 10 (Start time: 10:23:52 PM) Total Marks: 1
Forward edge is:
Select correct option:
(u, v) where u is a proper descendent of v in the tree.
(u, v) where v is a proper descendent of u in the tree. Ans
(u, v) where v is a proper ancesstor of u in the tree.
(u, v) where u is a proper ancesstor of v in the tree.

Question # 3 of 10 (Start time: 10:25:10 PM) Total Marks: 1
There is relationship between number of back edges and number of cycles in DFS
Select correct option:
Both are equal.
Cycles are half of back edges.
Cycles are one fourth of back edges.
There is no relationship between back edges and number of cycles. Ans

Question # 4 of 10 (Start time: 10:25:31 PM) Total Marks: 1
In undirected graph, by convention all the edges are called _____ edges.
Select correct option:
Forward
Back Ans
Cross
Both forward and back

Question # 5 of 10 (Start time: 10:26:38 PM) Total Marks: 1
For undirected graph, there is no distinction between forward and back edges.
Select correct option:
True
False

Question # 6 of 10 (Start time: 10:26:55 PM) Total Marks: 1
Adding any edge to a free tree creates a unique _____ .
Select correct option:
Vertex
Edge
Cycle
Strong component

Question # 7 of 10 (Start time: 10:27:09 PM) Total Marks: 1
In _____ algorithm, at any time, the subset of edges A forms a single tree.
Select correct option:
Kruskal's
Prim's Ans
Both
None

Question # 8 of 10 (Start time: 10:27:23 PM) Total Marks: 1
In strong components algorithm, the form of graph is used in which all the _____ of original graph G have been reversed in direction.
Select correct option:
Vertices
Edges Ans (not sure)
Both edges & vertices
None of the above

True False

- Please choose one

Question # 9 of 10 (Start time: 10:28:31 PM) Total Marks: 1

According to parenthesis lemma, vertex u is a descendent of v vertex if and only if;
Select correct option:

[d[u], f[u]] ⊆ [d[v], f[v]] Ans

[d[u], f[u]] ⊇ [d[v], f[v]]

Unrelated

Disjoint

Question # 10 of 10 (Start time: 10:29:23 PM) Total Marks: 1
Strongly connected components are not affected by reversal of all edges in terms of vertices reachability.
Select correct option:
True Ans
False

-

Question # 1 of 10 (Start time: 10:23:08 PM) Total Marks: 1
Adding any edge to a free tree creates a unique cycle.
Select correct option:
True Ans
False

Question # 2 of 10 (Start time: 10:23:52 PM) Total Marks: 1
Forward edge is:
Select correct option:
(u, v) where u is a proper descendent of v in the tree.
(u, v) where v is a proper descendent of u in the tree. Ans
(u, v) where v is a proper ancesstor of u in the tree.
(u, v) where u is a proper ancesstor of v in the tree.

Question # 3 of 10 (Start time: 10:25:10 PM) Total Marks: 1
There is relationship between number of back edges and number of cycles in DFS
Select correct option:
Both are equal.
Cycles are half of back edges.
Cycles are one fourth of back edges.
There is no relationship between back edges and number of cycles. Ans

Question # 4 of 10 (Start time: 10:25:31 PM) Total Marks: 1
In undirected graph, by convention all the edges are called _____ edges.
Select correct option:
Forward
Back Ans
Cross
Both forward and back

Question # 5 of 10 (Start time: 10:26:38 PM) Total Marks: 1
For undirected graph, there is no distinction between forward and back edges.
Select correct option:
True Ans
False

Question # 6 of 10 (Start time: 10:26:55 PM) Total Marks: 1
Adding any edge to a free tree creates a unique _____ .
Select correct option:

True False

- Please choose one

Vertex

Edge
Cycle Ans
Strong component

Question # 7 of 10 (Start time: 10:27:09 PM) Total Marks: 1
In _____ algorithm, at any time, the subset of edges A forms a single tree.
Select correct option:
Kruskal's
Prim's Ans
Both
None

Question # 8 of 10 (Start time: 10:27:23 PM) Total Marks: 1
In strong components algorithm, the form of graph is used in which all the _____ of original graph G have been reversed in direction.
Select correct option:
Vertices
Edges Ans
Both edges & vertices
None of the above

Question # 9 of 10 (Start time: 10:28:31 PM) Total Marks: 1
According to parenthesis lemma, vertex u is a descendent of v vertex if and only if;
Select correct option:

[d[u], f[u]] ⊆ [d[v], f[v]] Ans

[d[u], f[u]] ⊇ [d[v], f[v]]

Unrelated

Disjoint

Question # 10 of 10 (Start time: 10:29:23 PM) Total Marks: 1
Strongly connected components are not affected by reversal of all edges in terms of vertices reachability.
Select correct option:
True Ans
False
Question # 1 of 10 (Start time: 08:34:15 PM) Total Marks: 1
According to parenthesis lemma, vertex u is unrelated to v vertex if and only if d[u],f[u]] and [d[v],f[v]] are disjoint.
Select correct option:
True Ans
False

Question # 2 of 10 (Start time: 08:35:47 PM) Total Marks: 1
Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree edge) when the graph has relatively few edges.
Select correct option:
True
False Ans

Question # 3 of 10 (Start time: 08:37:05 PM) Total Marks: 1
You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T.?
Select correct option:
? (V + E) Ans

True False

- Please choose one

? (V E)

? (V)
? (V^2)

Question # 4 of 10 (Start time: 08:38:13 PM) Total Marks: 1
Kruskal's algorithm works by adding vertices in increasing order of weight (lightest edge first).
Select correct option:
True Ans
False

Question # 5 of 10 (Start time: 08:38:38 PM) Total Marks: 1
In Prim's algorithm, we will make use of priority _____.
Select correct option:
Stack
Queue Ans
Array
Graph

Question # 6 of 10 (Start time: 08:39:03 PM) Total Marks: 1
If a vertex v is a descendent of vertex u, then v's start-finish interval is contained within u's start-finish interval.
Select correct option:
True Ans
False

Question # 7 of 10 (Start time: 08:39:53 PM) Total Marks: 1
Computing the strongly connected components of a digraph is a generalization of the problem to determine whether a digraph is strongly connected or not.
Select correct option:
True Ans
False

Question # 8 of 10 (Start time: 08:41:01 PM) Total Marks: 1
Adding any edge to a free tree creates a unique _____ .
Select correct option:
Vertex
Edge
Cycle Ans
Strong component

Question # 9 of 10 (Start time: 08:41:41 PM) Total Marks: 1
Networks are complete in the sense that it is possible from any location in the network to reach any other location in the digraph.
Select correct option:
True Ans
False

Question # 10 of 10 (Start time: 08:42:10 PM) Total Marks: 1
By breaking any edge on a cycle created in free tree, the free _____ is restored.
Select correct option:
Edge
Tree Ans
Cycle
Vertex

Timestamp structure of _____ is used in determining the strong components of a digraph.
Select correct option

True False

- Please choose one

DFS

BFS

Both DFS & BFS

None

For a digraph G = (V, E), Sum of in-degree(v) _____
Select correct option

Not equal to Sum of out-degree(v)

= Sum of out-degree(v) ok

< Sum of out-degree(v)

> Sum of out-degree(v)
Question # 2 of 10 (Start time: 09:32:33 PM) Total Marks: 1
We say that two vertices u and v are mutually not reachable if u can reach v and vice versa.
Select correct option

True ok

False

Question # 6 of 10 (Start time: 09:36:53 PM) Total Marks: 1
The Huffman codes provide a method of _____ data efficiently.
Select correct option

Reading

Encoding ok

Decoding

Printing
Question # 7 of 10 (Start time: 09:37:46 PM) Total Marks: 1
In greedy algorithm, at each phase, you take the_____ you can get right now, without regard for future consequences.
Select correct option

Worst

Minimum

Good

Best ok
Question # 8 of 10 (Start time: 09:38:38 PM) Total Marks: 1
In digraph G=(V,E) ;G has cycle if and only if
Select correct option

The DFS forest has forward edge.

The DFS forest has back edge ok

The DFS forest has both back and forward edge

BFS forest has forward edge
Question # 9 of 10 (Start time: 09:39:38 PM) Total Marks: 1
In Activity selection (using Greedy approach), intuitively _____.
Select correct option

Short activities are not preferable

True False

- Please choose one

There are always short activities as input

We do not like long activities ok

It does not matter about the length of activities
Question # 10 of 10 (Start time: 09:40:50 PM) Total Marks: 1
Breadth-first search begins at a root node and inspects all the nodes except neighboring ones.
Select correct option

True

False ok

-

In in-place sorting algorithm is one that uses arrays for storage :
An additional array
No additional array
Both of above may be true according to algorithm
More than 3 arrays of one dimension.

The running time of quick sort depends heavily on the selection of
No of inputs
Arrangement of elements in array
Size o elements
Pivot element

In stable sorting algorithm
One array is used
In which duplicating elements are not handled.
More then one arrays are required.
Duplicating elements remain in same relative position after sorting.

Which sorting algorithn is faster :
O(n^2)
O(nlogn)
O(n+k)
O(n^3)

In Quick sort algorithm,constants hidden in T(n lg n) are
Large
Medium
Not known
Small

Quick sort is based on divide and conquer paradigm; we divide the problem on base of pivot element and:
There is explicit combine process as well to conquer the solution.
No work is needed to combine the sub-arrays, the array is already sorted
Merging the subarrays
None of above.

There is relationship between number of back edges and number of cycles in DFS
Both are equal.
Cycles are half of back edges.
Cycles are one fourth of back edges.
There is no relationship between back edges and number of cycle

True False

- Please choose one

You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T ?

(V+E)
V.E
V
E

You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T.?

?(V + E)
?(V E)
?(V)
?(V^2)

What is the time complexity to extract a vertex from the priority queue in Prim's algorithm?

log (V)
V.V
E.E
log (E)

Dijkstra's algorithm :

Has greedy approach to find all shortest paths
Has both greedy and Dynamic approach to find all shortest paths
Has greedy approach to compute single source shortest paths to all other vertices
Has both greedy and dynamic approach to compute single source shortest paths to all other vertices.

What algorithm technique is used in the implementation of Kruskal solution for the MST?

Greedy Technique
Divide-and-Conquer Technique
Dynamic Programming Technique
The algorithm combines more than one of the above techniques

Which is true statement in the following.

Kruskal algorithm is multiple source technique for finding MST.
Kruskal's algorithm is used to find minimum spanning tree of a graph, time complexity of this algorithm is O(EV)
Both of above
Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best Tree edge) when the graph has relatively few edges)

The relationship between number of back edges and number of cycles in DFS is,

Both are equal
Back edges are half of cycles
Back edges are one quarter of cycles
There is no relationship between no. of edges and cycles

Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree edge) when the graph has relatively few edges

True
False

Suppose that a graph G = (V,E) is implemented using adjacency lists. What is the complexity of a breadth-first traversal of G?

O(|V |^2)
O(|V | |E|)

True False

- Please choose one

O(|V |^2|E|)

O(|V | + |E|)

What is generally true of Adjacency List and Adjacency Matrix representations of graphs?
Lists require less space than matrices but take longer to find the weight of an edge (v1,v2)
Lists require less space than matrices and they are faster to find the weight of an edge (v1, v2)
Lists require more space than matrices and they take longer to find the weight of an edge (v1, v2)
Lists require more space than matrices but are faster to find the weight of an edge (v1, v2)

What general property of the list indicates that the graph has an isolated vertex?
There is Null pointer at the end of list.
The Isolated vertex is not handled in list.
Only one value is entered in the list.
There is at least one null list.

A dense undirected graph is:
A graph in which E = O(V^2)
A graph in which E = O(V)
A graph in which E = O(log V)
All items above may be used to characterize a dense undirected graph

In digraph G=(V,E) ;G has cycle if and only if
The DFS forest has forward edge.
The DFS forest has back edge
The DFS forest has both back and forward edge
BFS forest has forward edge

Back edge is:
(u, v) where v is an ancestor of u in the tree.
(u,v) where u is an ancesstor of v in the tree.
(u, v) where v is an predcessor of u in the tree.
None of above

Using ASCII standard the string “abacdaacacwe” will be encoded with _____ bits
64
128
96
120

Cross edge is :
(u, v) where u and v are not ancestor of one another
(u, v) where u is ancesstor of v and v is not descendent of u.
(u, v) where u and v are not ancestor or descendent of one another
(u, v) where u and v are either ancestor or descendent of one another.

Which statement is true?
If a dynamic-programming problem satisfies the optimal-substructure property, then a locally optimal solution is globally optimal.
If a greedy choice property satisfies the optimal-substructure property, then a locally optimal solution is globally optimal.
Both of above
None of above

If you find yourself in maze the better traversel approach will bEA dense undirected graph is:

True False

- Please choose one

A graph in which E = O(V^2)

A graph in which E = O(V)
A graph in which E = O(log V)
All items above may be used to characterize a dense undirected graph

Which is true statement.
Breadth first search is shortest path algorithm that works on un-weighted graphs
Depth first search is shortest path algorithm that works on un-weighted graphs.
Both of above are true.
None of above are true.

Forward edge is:
(u, v) where u is a proper descendent of v in the tree.
(u, v) where v is a proper descendent of u in the tree.
(u, v) where v is a proper ancesstor of u in the tree.
(u, v) where u is a proper ancesstor of v in the tree.

In digraph G=(V,E) ;G has cycle if and only if
The DFS forest has forward edge.
The DFS forest has back edge
The DFS forest has both back and forward edge
BFS forest has forward edge

If you find yourself in maze the better traversel approach will be :
BFS
BFS and DFS both are valid
Level order
DFS

What algorithm technique is used in the implementation of Kruskal solution for the MST?
Greedy Technique
Divide-and-Conquer Technique
Dynamic Programming Technique
The algorithm combines more than one of the above techniques

Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree edge) when the graph has relatively few
True
False

A digraph is strongly connected under what condition?
A digraph is strongly connected if for every pair of vertices u, v e V, u can reach v .
A digraph is strongly connected if for every pair of vertices u, v e V, u can reach v and vice versa.
A digraph is strongly connected if for at least one pair of vertex u, v e V, u can reach v and vice versa.
A digraph is strongly connected if at least one third pair of vertices u, v e V, u can reach v and vice versa.

The relationship between number of back edges and number of cycles in DFS is,
Both are equal
Back edges are half of cycles
Back edges are one quarter of cycles
There is no relationship between no. of edges and cycles

What algorithm technique is used in the implementation of Kruskal solution for the M ST?
Greedy Technique

True False

- Please choose one

Divide-and-Conquer Technique

Dynamic Programming Technique
The algorithm combines more than one of the above techniques

The _____ given by DFS allow us to determine whether the graph contains any cycles. CS502

- Order
- **Time stamps** Page 130
- BFS traversing
- Topological sort

A graph is not connected if every vertex can reach every other vertex. CS502

- True
- **False** Page No. 116

In strong components algorithm, first of all DFS is run for computing finish times of vertices. CS502

- **True** Page No.138
- False

In strong components algorithm, first of all DFS is run for computing finish times of vertices. CS502

- [d[u], f[u]]⊆[d[v], f[v]]
- [d[u], f[u]]⊇[d[v], f[v]]
- **unrelated** Page No.129
- Disjoint

For traversing graphs, Breadth-first search can be visualized as a wave front propagating inwards towards root (or source) node. CS502

- True
- **False** Page No.117

Digraphs are not used in communication and transportation networks. CS502

- True
- **False** Page No.135

You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T.? CS502 ?

True False

- Please choose one

- **(V + E)** Page No.138
- V E
- V
- E

In computing the strongly connected components of a digraph, vertices of the digraph are not partitioned into subsets. CS502

- True
- **False** Page No.135

There are no _____ edges in undirected graph. CS502

- Forward
- Back
- Cross
- **Both Forward and Back** Page No. 130

We say that two vertices u and v are mutually not reachable if u can reach v and vice versa. CS502

- **True** Page No. 135
- False

- There is relationship between number of back edges and number of cycles in DFS Select correct option:
- Both are equal.
- Cycles are half of back edges.
- Cycles are one fourth of back edges.
- **There is no relationship between back edges and number of cycles**. **(Correct)**
-
-
- In strong components algorithm, the form of graph is used in which all the vertices of original graph G have been reversed in direction. Select correct option:
- **True** **(Correct)**
- False
-

True False

- Please choose one

- In Kruskal's algorithm, the next edge is added to viable set A, if its adding does not induce a/an _____ . Select correct option:
-
- Vertex
- Edge
- **Cycle (Correct)**
- Tree
-
-
- For undirected graph, there is no distinction between forward and back edges. Select correct option:
- **True (Correct)**
- False
-
- You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T ? Select correct option:
- **(V+E) (Correct)**
- V.E
- V
- E
-
- There exist a unique path between any _____ vertices of a free tree. Select correct option:
- One
- **Two (Correct)**
- Three
- All
-

True False

- Please choose one

- A digraph is strongly connected under what condition? Select correct option:
-
- A digraph is strongly connected if for every pair of vertices u, v e V, u can reach v .
- **A digraph is strongly connected if for every pair of vertices u, v e V, u can reach v and vice versa. (Correct)**
- A digraph is strongly connected if for at least one pair of vertex u, v e V, u can reach v and vice versa.
- A digraph is strongly connected if at least one third pair of vertices u, v e V, u can reach v and vice versa.
-
-
- If u and v are mutually reachable in G, then in the graph formed by reversing all the edges, these vertices are not reachable. Select correct option:
- True
- **False (Correct)**
-
-
- In Prim's algorithm, at any time, the subset of edges A forms a single forest. Select correct option:
- True
- **False (Correct)**
-
- In digraph G=(V,E) ;G has cycle if and only if
- The DFS forest has forward edge.
- **The DFS forest has back edge**
- The DFS forest has both back and forward edge
- BFS forest has forward edge

True False

- Please choose one

Question No: 1 (Marks: 1) - Please choose one

In_____ algorithm, at anytime, the subset of edges A forms a single tree.

Kruskal's
Prim's
Both
None

Question No: 2 (Marks: 1) - Please choose one

According to parenthesis lemma, vertex u is unrelated to v vertex if and only if [d[u], f[u]] and [d[v], f[v]] are disjoint.

True
False

Question No: 3 (Marks: 1) - Please choose one

A free tree with n vertices have exactly n+1 edges.

True
Fale

True False

- Please choose one

Question No: 4 (Marks: 1) - Please choose one

For undirected graph, there is no distinction between forward and back edges.

True
Fale

Question No: 5

In computing the strongly connected components of a digraph, vertices of the digraph are not partitioned into subsets.

True
False

Question No: 6 (Marks: 1) - Please choose one

What is the time complexity to extract a vertex from the priority queue in Prim's algorithm?

log (V)
V.V
E.E
log (E)

True False

- Please choose one

Question No: 7 (Marks: 1) - Please choose one

What is true statement?

Breadth first search is shortest path algorithm that works on un-weighted graphs
Depth first search is shortest path algorithm that works on un-weighted graphs
Both of above are true
None of above are true

Question No: 8 (Marks: 1) - Please choose one

Networks are_____ in the sense that it is possible from any location in the network to reach any other location in the digraph.

Complete
Incomplete
Not graphs
Transportation

Question No: 9 (Marks: 1) - Please choose one

In Generic approach determining of Greedy MST, we maintain a subset A of are_____

Edges
Vertices
Cycles
Paths

True False

- Please choose one

Question No: 10 (Marks: 1)

There are no_____ edges in undirected graph.

Forward
Back
Cross
Both forward and back

Question No: 11 (Marks: 1) - Please choose one

If you find yourself in maze the better traversal approach will be:

BFS
BFS and DFS both are valid
Level order
DFS

Question No: 12 (Marks: 1) - Please choose one

In strong components algorithm, the form of graph is used in which all the vertices of original graph G have been reversed in direction.

True
False

True False

- Please choose one

Question No: 13 (Marks: 1) - Please choose one

What algorithm technique is used in the implementation of Kruskal solution for the MST?

Greedy Technique
Divide-and-Conquer Technique
Dynamic Programming Technique
The algorithm combines more than one of the above techniques

Question No: 14 (Marks: 1) - Please choose one

In Kruskal's algorithm, the next edge is added to viable set A, if its adding does not induce a cycle.

True False

Question No: (Marks: 1) - Please choose one

15

There exists a unique path between any_____ vertices of a free tree.

One
Two
Three
All

Question No: 16 (Marks: 1) - Please choose one

Computing the strongly connected components of a digraph is a generalization of the problem to determine whether a digraph is strongly connected or not.

True
False

Question No: 17 (Marks: 1) - Please choose one

If a vertex is a descendent of vertex u, then v's start-finish interval is contained within u's start-finish interval.

True
False

True False

- Please choose one

Question No: 18 (Marks: 1) - Please choose one

The_____ given by DFS allow us to determine whether the graph contains any cycles.

Order
Time stamps
BFS traversing
Topological sort

Question No: 19 (Marks: 1) - Please choose one

Networks are complete in the sense that it is possible from any location in the network to reach any other location in the digraph.

Question No: 20 (Marks: 1)

There are no_____ edges in undirected graph.

Forward
Back
Cross
Both forward and back

Question No: 21 (Marks: 1) - Please choose one

True False

- Please choose one

You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T.?

? (V + E)
? (V E)
? (V)
? (V^2)

Question No: 22 (Marks: 1) - Please choose one

There are no_____ edges in undirected graph.

Forward
Back
Cross
Both forward and back

Question No: 23 (Marks: 1) - Please choose one

In Prim's algorithm, at anytime, the subset of edges A forms a single_____.

Vertex
Forest
Tree
Graph

True False

- Please choose one

Question No: 24 (Marks: 1) - Please choose one

Kruskal's algorithm works by adding vertices in increasing order of weight (lightest edge first).

25

Runtime complexity of Prim's algorithm is _____.

V log V
E log V
log V
None of the above

Question No: 26 (Marks: 1) - Please choose one

According to parenthesis lemma, vertex u is an ancestor of v vertex if and only if;

[d[u], f[u]] ⊆ [d[v], f[v]]
[d[u], f[u]] ⊇ [d[v], f[v]]
Unrelated
Disjoint

Question No: 27 (Marks: 1) - Please choose one

In Kruskal's algorithm, the next _____ is not added to viable set A, if its adding induce a/an

True False

- Please choose one

cycle.

Vertex
Edge
Cycle
Tree

Question No: 28 (Marks: 1) - Please choose one

In Prim's algorithm, we start with the _____ vertex r; it can be any vertex.

First
Leaf
Mid
Root

Question No: 29 (Marks: 1) - Please choose one

A free tree with n vertices has exactly n+1 edges.

True
False

True False

(Marks: 1) - Please choose one

Question No: 30

There exists a unique path between any _____ vertices of a free tree.

One
Two
Three
All

Question No: 31 (Marks: 1) - Please choose one

The tricky part of the _____ algorithm is how to detect whether the addition of an edge will create a cycle in viable set A.

Kruskal's
Prim's
Both
None

Question No: 32 (Marks: 1) - Please choose one

In Prim's algorithm, we start with the root vertex r; it can be any vertex.

True
False

Question No: -

Question No: 33 (Marks: 1) - Please choose one

The relationship between number of back edges and number of cycles in DFS is,

Both are equal
Back edges are half of cycles
Back edges are one quarter of cycles
There is no relationship between no. of edges and cycles

Question No: 34 (Marks: 1) - Please choose one

If you find yourself in maze the better traversal approach will be:

BFS
BFS and DFS both are valid
Level order
DFS

35 Please choose one

According to parenthesis lemma, vertex u is an ancestor of v vertex if and only if;

[d[u], f[u]] ⊆ [d[v], f[v]]
[d[u], f[u]] ⊇ [d[v], f[v]]
Unrelated
Disjoint

Question No: -

Question No: 36 (Marks: 1) - Please choose one

We say that two vertices u and v are mutually not reachable if u can reach v and vice versa.

True
False

Question No: 37 (Marks: 1) - Please choose one

In Generic approach determining of Greedy MST, we maintain a subset A of are_____

Edges
Vertices
Cycles
Paths

Question No: 38 (Marks: 1) - Please choose one

Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree edge) when the graph has relatively few edges.

True
False

Question No: -

Question No: 39 (Marks: 1) - Please choose one

Digraphs are not used in communication and transportation networks.

True
False

40 (Marks: 1) Please choose one

We say that two vertices u and v are mutually not reachable if u can reach v and vice versa.

True
False

Question No: 41 (Marks: 1) - Please choose one

Runtime complexity of Prim's algorithm is _____.

V log V **E**
log V log
V
None of the above

Question No: -

Question No: 42 (Marks: 1) - Please choose one

In Prim's algorithm, we start with the root vertex r; it can be any vertex.

True
False

Question No: 43 (Marks: 1) - Please choose one

Networks are _____ in the sense that it is possible from any location in the network to reach any other location in the digraph.

Complete
Incomplete
Not graphs
Transportation

Question No: 44 (Marks: 1) - Please choose one

Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree edge) when the graph has relatively few edges.

True False

Question No: -

45

In strong components algorithm, vertices are sorted in_____ order of finish times.

Any
Increasing
Decreasing
None

Question No: 46 (Marks: 1) - Please choose one

In Kruskal's algorithm, at anytime, the subset of edges A forms a single tree.

True
False

Question No: 47 (Marks: 1) - Please choose one

If a subset of edges A is viable for building MST, it can not contain a/an_____.

Vertex
Edge
Cycle
Graph

Question No: -

Question No: 48 (Marks: 1) - Please choose one

In Timestamped DFS-cycles lemma, if edge (u,v) is a tree, forward or cross edge, then_____.

{\text{f[u]}} < {\text{f[v]}} {\text{f[u]}} >
{\text{f[v]}}
f[u] ≤ f[v]
f[u] ≥ f[v]

Question No: 49 (Marks: 1) - Please choose one

Strongly connected components are not affected by reversal of all edges in terms of vertices reachability.

True False **50**
If u and v are mutually reachable in G, then in the graph formed by reversing all the edges, these vertices are not reachable.

True
False

Question No: 51 (Marks: 1) - Please choose one

Forward edge is:

(u, v) where u is a proper descendent of v in the tree.
(u, v) where v is a proper descendent of u in the tree.
(u, v) where v is a proper ancestor of u in the tree.
(u, v) where u is a proper ancestor of v in the tree.

Question No: -

Question No: 52 (Marks: 1) - Please choose one

According to parenthesis lemma, vertex u is an ancestor of v vertex if and only if;

[d[u], f[u]] ⊆ [d[v], f[v]]
[d[u], f[u]] ⊇ [d[v], f[v]]
Unrelated
Disjoint

Question No: 53 (Marks: 1) - Please choose one

In Timestamped DFS-cycles lemma, if edge (u,v) is a tree, forward or cross edge, then_____.

{\text{f[u]}} < {\text{f[v]}} {\text{f[u]}} >
{\text{f[v]}}
f[u] ≤ f[v]
f[u] ≥ f[v]

Question No: 54 (Marks: 1) - Please choose one

As the Kruskal's algorithm runs, the edges in viable set A induce a_____ on the vertices.

Set
Graph
Tree
Forest

55

Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree edge) when the

Question No: -

graph has relatively few edges.

True
False

Question No: 56 (Marks: 1) - Please choose one

Runtime complexity of Prim's algorithm is _____.

V log V E log V
log V
None of the above

Question No: 57 (Marks: 1) - Please choose one

Kruskal's algorithm works by adding _____vertices in increasing order of weight (lightest edge first).

Vertices
Edges
Trees
Weights

Question No: 58 (Marks: 1) - Please choose one

In strong components algorithm, the form of graph is used in which all the vertices of original graph G have been reversed in direction.

Question No: -

True

False

السلام علیکم اللہ ورحمتہ وبرکاتہ

اللہ" وَتُعِزُّ مَن تَشَاءُ وَتُذِلُّ مَن تَشَاءُ

اللہ "جسے چاہے عزت دے اور جسے چاہے ذلیل کرے"

JUST PRAY FOR ME

REGARD : RIZWAN MANZOOR



Cs-502 Important Macq's For Final Term
Solve By Vu-Toper RM
What's app 03224021365
Paid Tasks = LMS Handling + Online Classes + Project

1. Dijkstra's Algorithm is used to solve _____ problems.
   a) All pair shortest path
   b) Single source shortest path
   c) Network flow
   d) Sorting

2. Which of the following is the most commonly used data structure for implementing Dijkstra's Algorithm?
   a) Max priority queue
   b) Stack
   c) Circular queue
   d) Min priority queue

3. What is the time complexity of Dijikstra's algorithm?
   a) O(N)
   b) $O(N^3)$
   c) $O(N^2)$
   d) O(logN)

- Please choose one

---

4. Dijkstra's Algorithm cannot be applied on _____
   a) Directed and weighted graphs
   b) Graphs having negative weight function
   c) Unweighted graphs
   d) Undirected and unweighted graphs

5. How many priority queue operations are involved in Dijkstra's Algorithm?
   a) 1
   b) 3
   c) 2
   d) 4

6. How many times the insert and extract min operations are invoked per vertex?
   a) 1
   b) 2
   c) 3
   d) 0

7. The maximum number of times the decrease key operation performed in Dijkstra's algorithm will be equal to _____
   a) Total number of vertices
   b) Total number of edges
   c) Number of vertices – 1
   d) Number of edges – 1

8. What is running time of Dijkstra's algorithm using Binary min- heap method?
   a) O(V)
   b) O(VlogV)
   c) O(E)
   d) O(ElogV)

True False

- Please choose one

---

9. The running time of Bellmann Ford algorithm is lower than that of Dijkstra's Algorithm.

a) True

b) False

10. Dijkstra's Algorithm run on a weighted, directed graph G={V,E} with non-negative weight function w and source s, terminates with d[u]=delta(s,u) for all vertices u in V.

a) True

b) False

11. Dijkstra's Algorithm is the prime example for _____

a) Greedy algorithm

b) Branch and bound

c) Back tracking

d) Dynamic programming

1. Computing the strongly connected components of a graph is a generalization of the problem to determine whether a digraph is strongly connected or not.

   True

2. If u finds yourself in maze the better traversal approach will be:

   BFS and DFS are valid

3. In ---------- algorithm, at any time, the subset of edges A forms a single tree.

   Prim's

True False

- Please choose one

---

4. In computing the strongly connected components of a digraph, vertices of the digraph are not partitioned into subsets.

   False

5. Which is true statement:

   The breadth-first-search is a shortest-path algorithm that works on un-weighted graphs.

6. There are no ---------- edges in undirected graph.

   Cross

7. In undirected graph, by convention all the edges are called ---------- edges.

   Back

8. A digraph is strongly connected under what condition?

   A digraph is strongly connected if for every pair of vertices u, v ∈ V, u can reach v and vice versa.

9. The tricky part of the ---------- algorithm is how to detect whether the addition of an edge will create a cycle in viable set A.

   Kruskal's

10. Digraphs are not used in communication and transportation networks.

    True

11. If u and v are mutually reachable in G, then in the graph formed by reversing all the edges, these vertices are not reachable.

True False

- Please choose one

False

12. A topological sort of a DAG is a---------- ordering of the vertices of the DAG such that for each (u, v), u appears before v in the ordering.

Linear

13. Kruskal's algorithm works by adding vertices in increasing order of weight (lightest edge first).

False

14. Adding an edge to a free tree creates:

Cycle

15. Forward edge is:

(u, v) where v is a proper descendent of u in the tree

16. In strong components algorithm, vertices are sorted in ---------- order of finish times.

Decreasing

17. In Kruskal's algorithm the next edge is not added to viable set A, if it's adding Induce a cycle.

True

18. What is the time complexity to extract a vertex from priority queue in Prim's algorithm?

(log V)

19. A graph may contain----------.

True False

- Please choose one

More than one MST

20. Prim's algorithm builds MST by starting with any vertex and at any time the subset of edges form:

A single tree

21. In Prim's algorithm, we start with the---------- vertex r; it can be any vertex.

Root

22. The ---------- given by DFS allow us to determine whether the graph contains any cycles.

Time Stamps

23. You have an adjacency list for G, what is time complexity to compute Graph transpose G^T?

Θ (V + E)

24. Back edge is:

Ans. (u, v) where v is an ancestor of u in the tree

25. What algorithm technique is used in the implementation of Kruskal solution for the MST?

Ans. Greedy Technique (Pg. # 142)

26. If a subset of edges A is viable for building MST. It cannot contain a/an----------.

Ans. Cycle (Pg. # 143)

True False

- Please choose one

---

27. Adding any edge to a free tree creates a unique----------

Ans. Cycle (Pg#142)

28. Prim's algorithm is based on -------- strategy.

Ans. Greedy (Pg. # 142)

29. In strong components algorithm, First of all DFS is run for getting ---------- times of vertices.

Ans. Finish

30. There exists a unique path between any two vertices of a free tree.

Ans. True (pg. # 142)

31. In strong components algorithm, first of all DFS is run for computing finish times of vertices.

Ans. true

32. There is relationship between number of back edges and number of cycle in DFS

Ans. there is no relationship between number of back edges and number of cycles

33. In Prim's algorithm at any time, the subset of edges A forms a single forest.

Ans. False (pg#149)

34. In Kruskal's algorithm at any time, the subset of edges A forms a single tree.

True False

- Please choose one

Ans. False (pg#149)

35. Kruskal's algorithm works by adding ---------- in increasing order of weight (lightest edge first).

Ans. edges (Pg. # 147)

36. In Prims algorithm we will make use of priority----------.

Ans. queue (pg. # 150)

37. Cross edge is :

Ans. (u, v) where u and v are not ancestor or descendent of one another

38. The ancestor and descendent relation cannot be inferred by the parenthesis Lemma.

Ans. False (Pg. # 129)

39. In Kruskal's algorithm, the next ---------- is not added to viable set A, if it's adding induce a/an cycle.

Ans. edge (Pg. # 147)

40. Equivalence relation partitions the vertices into ---------- classes of mutually reachable vertices and these are the strong components.

Ans. Equivalence (Pg#136)

41. For undirected graph, there is no distinction between forward and back edges.

Ans. True (Pg#130)

True False

- Please choose one

---

42. In strong components algorithm, the form of graph is used in which all the ---------- of original graph G have been reversed in direction.

Ans. edges (Pg. # 138)

43. Networks are complete in the sense that it is not possible from any location in the network to reach any other location in the digraph.

Ans. True (Pg#135)

44. In digraph G = (V, E) ; G has cycle if and only if:

Ans. The DFS forest has a back edge (Pg. # 131)

45. As the Kruskal's algorithm runs the edges in viable set A induce a ---------- on the vertices.

Ans. Forest (Pg#147)

46. Timestamp structure of ---------- is used in determining the strong components of a digraph.

Ans. Both DFS and BFS

47. In Prim's algorithm, we start with the _____ vertex r; it can be any vertex.

Root

48. In Prim's algorithm, at any time, the subset of edges A forms a single _____.

Tree

True False

- Please choose one

---

49. Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree edge) when the graph has relatively few edges.

    True

50. There is relationship between number of back edges and number of cycles in DFS

    There is no relationship between back edges and number of cycles.

51. In Prim's algorithm, we will make use of priority _____.

    Queue

52. We say that two vertices u and v are mutually not reachable if u can reach v and vice versa.

    False

53. In strong components algorithm, the form of graph is used in which all the vertices of original graph G have been reversed in direction.

    False

54. In Timestamped DFS-cycles lemma, if edge (u, v) is a back edge, then _____

    f[u]⩽f[v]

55. There exist a unique path between any _____ vertices of a free tree.

True False

- Please choose one

Two

56. In strong components algorithm, vertices are sorted in_____ order of finish times.

Decreasing

57. According to parenthesis lemma, vertex u is unrelated to v vertex if and only if d[u],f[u]] and [d[v],f[v]] are disjoint.

True

58. A digraph is strongly connected under what condition?

A digraph is strongly connected if for every pair of vertices u, v e V, u can reach v and vice versa.

59. The tricky part of the _____ algorithm is how to detect whether the addition of an edge will create a cycle in viable set A.

Kruskal's

60. If a subset of edges A is viable for building MST, it can not contain a/an _____.

Cycle

61. Digraphs are not used in communication and transportation networks.

True

62. A strongly connected component only apply to:

True False

- Please choose one

Directed Graph

63. According to parenthesis lemma, vertex u is a descendent of v vertex if and only if;

[d[u], f[u]] ⊆ [d[v], f[v]

64. What is the time complexity to extract a vertex from the priority queue in Prim's algorithm?

(log V)

65. Back edge is:

(u, v) where v is an ancestor of u in the tree.

66. In computing the strongly connected components of a digraph, vertices of the digraph are not partitioned into subsets.

False

67. In Timestamped DFS-cycles lemma, if edge (u, v) is a tree, forward or cross edge, then _____

f[u]⩾f[v]

68. In Kruskal's algorithm, the next edge is added to viable set A, if its adding does not induce a/an _____ .

Cycle

69. In Generic approach determining of Greedy MST, we maintain a subset A of _____ .

Edges

True False

- Please choose one

---

70. If u and v are mutually reachable in G, then in the graph formed by reversing all the edges, these vertices are not reachable.

    False

71. Kruskal's algorithm works by adding _____ in increasing order of weight (lightest edge first).

    Edges

72. In Kruskal's algorithm, the next _____ is not added to viable set A, if its adding induce a/an cycle.

    Edge

73. Networks are complete in the sense that it is possible from any location in the network to reach any other location in the digraph.

    True

74. In Generic approach determining of Greedy MST, we maintain a subset A of _____ .

    Edges

75. There exist a unique path between any _____ vertices of a free tree.

    Two

76. What is the time complexity to extract a vertex from the priority queue in Prim's algorithm?

    log (V)

True False

- Please choose one

---

77. The time stamps given by DFS do not allow us to determine whether the graph contains any cycles.

False

78. Timestamp structure of _____ is used in determining the strong components of a digraph.

Both DFS & BFS

79. In Kruskal's algorithm, the next edge is not added to viable set A, if its adding induce a cycle.

False

80. A topological sort of a DAG is a _____ ordering of the vertices of the DAG such that for each edge (u, v), u appears before v in the ordering.

Linear

81. In Kruskal's algorithm, at any time, the subset of edges A forms a single tree.

False

82. Adding any edge to a free tree creates a unique cycle.

True

83. In digraph G=(V,E) ;G has cycle if and only if The DFS forest has back edge

Cycle

84. In undirected graph, by convention all the edges are called _____ edges.

True False

- Please choose one

Back

85. Prim’s algorithm is based on ---------- strategy.

Greedy

86. There are no _____ edges in undirected graph.

Cross

87. You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T ?

(V+E)

Which is true statement in the following.

Kruskal algorithm is multiple source technique for finding MST.

Kruskal's algorithm is used to find minimum spanning tree of a graph, time complexity of this algorithm is O(EV)

Both of above

Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best Tree edge) when the graph has relatively few edges) (Right Answer)

The relationship between number of back edges and number of cycles in DFS is,

Both are equal

Back edges are half of cycles

Back edges are one quarter of cycles

There is no relationship between no. of edges and cycles (Right Answer)

Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree

edge) when the graph has relatively few edges.

True (Right Answer)
False

What is the time complexity to extract a vertex from the priority queue in Prim's

algorithm?

True False

- Please choose one

Select correct option:

log (V)
V.V

E.E

log (E)

Suppose that a graph G = (V,E) is implemented using adjacency lists. What is the complexity of a breadth-first traversal of G?

Select correct option:

O(|V |^2)

O(|V | |E|) (Right Answer)
O(|V |^2|E|)

O(|V | + |E|)

What is generally true of Adjacency List and Adjacency Matrix representations of graphs?

Select correct option:

Lists require less space than matrices but take longer to find the weight of an edge (v1,v2)

Lists require less space than matrices and they are faster to find the weight of an edge (v1, v2) Right Answer)
Lists require more space than matrices and they take longer to find the weight of an edge (v1, v2)

Lists require more space than matrices but are faster to find the weight of an edge (v1, v2)

What general property of the list indicates that the graph has an isolated vertex?

Select correct option:

There is Null pointer at the end of list.

The Isolated vertex is not handled in list. (not Sure)
Only one value is entered in the list.

There is at least one null list.

A dense undirected graph is:

Select correct option:

A graph in which E = O(V^2) (Right Answer)
A graph in which E = O(V)

A graph in which E = O(log V)

True False

- Please choose one

All items above may be used to characterize a dense undirected graph

In digraph G=(V,E) ;G has cycle if and only if

Select correct option:

The DFS forest has forward edge.

The DFS forest has back edge (Right Answer)
The DFS forest has both back and forward edge

BFS forest has forward edge

Back edge is:

Select correct option:

(u, v) where v is an ancestor of u in the tree. (Right Answer)
(u,v) where u is an ancesstor of v in the tree.

(u, v) where v is an predcessor of u in the tree.

None of above

There is no relationship between back edges and number of cycle(Right Answer)

You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T ?

Select correct option:

(V+E) (Right Answer)
V.E

V

E

Question # 3 of 10 (Start time: 06:54:27 PM) Total Marks: 1

You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T.?

?(V + E) Right Answer)
?(V E)

?(V)

?(V^2)

True False

- Please choose one

What is the time complexity to extract a vertex from the priority queue in Prim's algorithm?

Select correct option:

log (V) (Right Answer)
V.V

E.E

log (E)

Dijkstra's algorithm :

Select correct option:

Has greedy approach to find all shortest paths

Has both greedy and Dynamic approach to find all shortest paths

Has greedy approach to compute single source shortest paths to all other vertices (Right Answer)
Has both greedy and dynamic approach to compute single source shortest paths to all other vertices.

What algorithm technique is used in the implementation of Kruskal solution for the MST?

Greedy Technique (Right Answer)
Divide-and-Conquer Technique

Dynamic Programming Technique

The algorithm combines more than one of the above techniques

What is the time complexity to extract a vertex from the priority queue in Prim's algorithm?

Select correct option:

O (log E)

? (V)

? (V+E)

O (log V) (Right Answer)

1. What algorithm technique is used in the implementation of Kruskal solution for MST?

a) Greedy Technique page 142

True False

- Please choose one

b) Divide-and-Conquer Technique

c) Dynamic Programming Technique

d) The algorithm combines more than one of the above techniques i.e. Divide-and-Conquer and dynamic programing

1. There exists a unique path between any _____ vertices of a free tree.

a) One

b) Two page 142

c) Three

d) All

1. If a subset of edges A is viable for building MST, it cannot contain a/an _____

a) Vertex

b) Edge

c) Cycle page 143

d) Graph

1. As the Kruskal's runs, the edges in viable set A induce a _____ on the vertices.

a) Set

b) Graph

c) Tree

d) Forest

1. The _____ given by DFS allow us to determine whether the graph contains any cycles.

a) Order

b) Time stamps page 130

c) BFS traversing

d) Topological sort

1. The time stamps given by DFS do not allow determining whether the graph contains any cycles.

a) True

b) False page130

1. By breaking any edge on a cycle created in free tree, the free _____ is restored.

a) Edge

b) Tree

c) Cycle page 143

d) Vertex

1. Forward edge is

a) (u, v) where u is a proper descendent of v in the tree

b) (u, v) where v is a proper descendent of u in the tree page 129

True False

- Please choose one

c) (u, v) where v is a proper ancestor of u in the tree

d) (u, v) where u is a proper ancestor of v in the tree

1. In Kruskal's algorithm, the next _____ is not added to viable set A, if its adding induces a/an cycle.

a) Vertex

b) Edge page147

c) Cycle

d) Tree

1. In _____ algorithm, at any time, the subset of edges A forms a single tree

a) Kruskal's

b) Prim's page 149

c) Both

d) None

Question # 1 of 10 (Start time: 10:14:37 PM) Total Marks: 1
There exist a unique path between any _____ vertices of a free tree.
Select correct option:
One
Two Ans
Three
All

Question # 2 of 10 (Start time: 10:15:15 PM) Total Marks: 1
In _____ algorithm, at any time, the subset of edges A forms a single tree.
Select correct option:
Kruskal's
Prim's Ans
Both
None

Question # 3 of 10 (Start time: 10:15:56 PM) Total Marks: 1
A digraph is strongly connected under what condition?
Select correct option:
A digraph is strongly connected if for every pair of vertices u, v e V, u can reach v .
A digraph is strongly connected if for every pair of vertices u, v e V, u can reach v and vice versa. Ans
A digraph is strongly connected if for at least one pair of vertex u, v e V, u can reach v and vice versa.
A digraph is strongly connected if at least one third pair of vertices u, v e V, u can reach v and vice versa.

Question # 4 of 10 (Start time: 10:16:38 PM) Total Marks: 1
Digraphs are not used in communication and transportation networks.
Select correct option:

True False

- Please choose one

True

False Ans

Question # 5 of 10 (Start time: 10:17:31 PM) Total Marks: 1
There are no _____ edges in undirected graph.
Select correct option:
Forward
Back
Cross
Both forward and back Ans

Question # 6 of 10 (Start time: 10:17:53 PM) Total Marks: 1
In Kruskal's algorithm, at any time, the subset of edges A forms a single tree.
Select correct option:
True
False Ans

Question # 7 of 10 (Start time: 10:18:12 PM) Total Marks: 1
Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree edge) when the graph has relatively few edges.
Select correct option:
True
False Ans

Question # 8 of 10 (Start time: 10:18:54 PM) Total Marks: 1
The _____ given by DFS allow us to determine whether the graph contains any cycles.
Select correct option:
Order
Time stamps Ans
BFS traversing
Topological sort

Question # 9 of 10 (Start time: 10:19:41 PM) Total Marks: 1
Kruskal’s algorithm works by adding _____ in increasing order of weight (lightest edge first).
Select correct option:
Vertices
Edges Ans
Trees
Weights

Question # 10 of 10 (Start time: 10:20:15 PM) Total Marks: 1
Runtime complexity of Prim's algorithm is _____.
Select correct option:
V log V
E log V Ans
log V
None of the above

-

Question # 1 of 10 (Start time: 10:23:08 PM) Total Marks: 1
Adding any edge to a free tree creates a unique cycle.

True False

- Please choose one

Select correct option:

True
False

Question # 2 of 10 (Start time: 10:23:52 PM) Total Marks: 1
Forward edge is:
Select correct option:
(u, v) where u is a proper descendent of v in the tree.
(u, v) where v is a proper descendent of u in the tree. Ans
(u, v) where v is a proper ancesstor of u in the tree.
(u, v) where u is a proper ancesstor of v in the tree.

Question # 3 of 10 (Start time: 10:25:10 PM) Total Marks: 1
There is relationship between number of back edges and number of cycles in DFS
Select correct option:
Both are equal.
Cycles are half of back edges.
Cycles are one fourth of back edges.
There is no relationship between back edges and number of cycles. Ans

Question # 4 of 10 (Start time: 10:25:31 PM) Total Marks: 1
In undirected graph, by convention all the edges are called _____ edges.
Select correct option:
Forward
Back Ans
Cross
Both forward and back

Question # 5 of 10 (Start time: 10:26:38 PM) Total Marks: 1
For undirected graph, there is no distinction between forward and back edges.
Select correct option:
True
False

Question # 6 of 10 (Start time: 10:26:55 PM) Total Marks: 1
Adding any edge to a free tree creates a unique _____ .
Select correct option:
Vertex
Edge
Cycle
Strong component

Question # 7 of 10 (Start time: 10:27:09 PM) Total Marks: 1
In _____ algorithm, at any time, the subset of edges A forms a single tree.
Select correct option:
Kruskal's
Prim's Ans
Both
None

Question # 8 of 10 (Start time: 10:27:23 PM) Total Marks: 1
In strong components algorithm, the form of graph is used in which all the _____ of original graph G have been reversed in direction.
Select correct option:
Vertices
Edges Ans (not sure)
Both edges & vertices
None of the above

True False

- Please choose one

Question # 9 of 10 (Start time: 10:28:31 PM) Total Marks: 1

According to parenthesis lemma, vertex u is a descendent of v vertex if and only if;
Select correct option:

[d[u], f[u]] ⊆ [d[v], f[v]] Ans

[d[u], f[u]] ⊇ [d[v], f[v]]

Unrelated

Disjoint

Question # 10 of 10 (Start time: 10:29:23 PM) Total Marks: 1
Strongly connected components are not affected by reversal of all edges in terms of vertices reachability.
Select correct option:
True Ans
False

-

Question # 1 of 10 (Start time: 10:23:08 PM) Total Marks: 1
Adding any edge to a free tree creates a unique cycle.
Select correct option:
True Ans
False

Question # 2 of 10 (Start time: 10:23:52 PM) Total Marks: 1
Forward edge is:
Select correct option:
(u, v) where u is a proper descendent of v in the tree.
(u, v) where v is a proper descendent of u in the tree. Ans
(u, v) where v is a proper ancesstor of u in the tree.
(u, v) where u is a proper ancesstor of v in the tree.

Question # 3 of 10 (Start time: 10:25:10 PM) Total Marks: 1
There is relationship between number of back edges and number of cycles in DFS
Select correct option:
Both are equal.
Cycles are half of back edges.
Cycles are one fourth of back edges.
There is no relationship between back edges and number of cycles. Ans

Question # 4 of 10 (Start time: 10:25:31 PM) Total Marks: 1
In undirected graph, by convention all the edges are called _____ edges.
Select correct option:
Forward
Back Ans
Cross
Both forward and back

Question # 5 of 10 (Start time: 10:26:38 PM) Total Marks: 1
For undirected graph, there is no distinction between forward and back edges.
Select correct option:
True Ans
False

Question # 6 of 10 (Start time: 10:26:55 PM) Total Marks: 1
Adding any edge to a free tree creates a unique _____ .
Select correct option:

True False

- Please choose one

Vertex

Edge
Cycle Ans
Strong component

Question # 7 of 10 (Start time: 10:27:09 PM) Total Marks: 1
In _____ algorithm, at any time, the subset of edges A forms a single tree.
Select correct option:
Kruskal's
Prim's Ans
Both
None

Question # 8 of 10 (Start time: 10:27:23 PM) Total Marks: 1
In strong components algorithm, the form of graph is used in which all the _____ of original graph G have been reversed in direction.
Select correct option:
Vertices
Edges Ans
Both edges & vertices
None of the above

Question # 9 of 10 (Start time: 10:28:31 PM) Total Marks: 1
According to parenthesis lemma, vertex u is a descendent of v vertex if and only if;
Select correct option:

[d[u], f[u]] ⊆ [d[v], f[v]] Ans

[d[u], f[u]] ⊇ [d[v], f[v]]

Unrelated

Disjoint

Question # 10 of 10 (Start time: 10:29:23 PM) Total Marks: 1
Strongly connected components are not affected by reversal of all edges in terms of vertices reachability.
Select correct option:
True Ans
False
Question # 1 of 10 (Start time: 08:34:15 PM) Total Marks: 1
According to parenthesis lemma, vertex u is unrelated to v vertex if and only if d[u],f[u]] and [d[v],f[v]] are disjoint.
Select correct option:
True Ans
False

Question # 2 of 10 (Start time: 08:35:47 PM) Total Marks: 1
Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree edge) when the graph has relatively few edges.
Select correct option:
True
False Ans

Question # 3 of 10 (Start time: 08:37:05 PM) Total Marks: 1
You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T.?
Select correct option:
? (V + E) Ans

True False

- Please choose one

? (V E)

? (V)
? (V^2)

Question # 4 of 10 (Start time: 08:38:13 PM) Total Marks: 1
Kruskal's algorithm works by adding vertices in increasing order of weight (lightest edge first).
Select correct option:
True Ans
False

Question # 5 of 10 (Start time: 08:38:38 PM) Total Marks: 1
In Prim's algorithm, we will make use of priority _____.
Select correct option:
Stack
Queue Ans
Array
Graph

Question # 6 of 10 (Start time: 08:39:03 PM) Total Marks: 1
If a vertex v is a descendent of vertex u, then v's start-finish interval is contained within u's start-finish interval.
Select correct option:
True Ans
False

Question # 7 of 10 (Start time: 08:39:53 PM) Total Marks: 1
Computing the strongly connected components of a digraph is a generalization of the problem to determine whether a digraph is strongly connected or not.
Select correct option:
True Ans
False

Question # 8 of 10 (Start time: 08:41:01 PM) Total Marks: 1
Adding any edge to a free tree creates a unique _____ .
Select correct option:
Vertex
Edge
Cycle Ans
Strong component

Question # 9 of 10 (Start time: 08:41:41 PM) Total Marks: 1
Networks are complete in the sense that it is possible from any location in the network to reach any other location in the digraph.
Select correct option:
True Ans
False

Question # 10 of 10 (Start time: 08:42:10 PM) Total Marks: 1
By breaking any edge on a cycle created in free tree, the free _____ is restored.
Select correct option:
Edge
Tree Ans
Cycle
Vertex

Timestamp structure of _____ is used in determining the strong components of a digraph.
Select correct option

True False

- Please choose one

DFS

BFS

Both DFS & BFS

None

For a digraph G = (V, E), Sum of in-degree(v) _____
Select correct option

Not equal to Sum of out-degree(v)

= Sum of out-degree(v) ok

< Sum of out-degree(v)

> Sum of out-degree(v)
Question # 2 of 10 (Start time: 09:32:33 PM) Total Marks: 1
We say that two vertices u and v are mutually not reachable if u can reach v and vice versa.
Select correct option

True ok

False

Question # 6 of 10 (Start time: 09:36:53 PM) Total Marks: 1
The Huffman codes provide a method of _____ data efficiently.
Select correct option

Reading

Encoding ok

Decoding

Printing
Question # 7 of 10 (Start time: 09:37:46 PM) Total Marks: 1
In greedy algorithm, at each phase, you take the_____ you can get right now, without regard for future consequences.
Select correct option

Worst

Minimum

Good

Best ok
Question # 8 of 10 (Start time: 09:38:38 PM) Total Marks: 1
In digraph G=(V,E) ;G has cycle if and only if
Select correct option

The DFS forest has forward edge.

The DFS forest has back edge ok

The DFS forest has both back and forward edge

BFS forest has forward edge
Question # 9 of 10 (Start time: 09:39:38 PM) Total Marks: 1
In Activity selection (using Greedy approach), intuitively _____.
Select correct option

Short activities are not preferable

True False

- Please choose one

There are always short activities as input

We do not like long activities ok

It does not matter about the length of activities
Question # 10 of 10 (Start time: 09:40:50 PM) Total Marks: 1
Breadth-first search begins at a root node and inspects all the nodes except neighboring ones.
Select correct option

True

False ok

-

In in-place sorting algorithm is one that uses arrays for storage :
An additional array
No additional array
Both of above may be true according to algorithm
More than 3 arrays of one dimension.

The running time of quick sort depends heavily on the selection of
No of inputs
Arrangement of elements in array
Size o elements
Pivot element

In stable sorting algorithm
One array is used
In which duplicating elements are not handled.
More then one arrays are required.
Duplicating elements remain in same relative position after sorting.

Which sorting algorithn is faster :
O(n^2)
O(nlogn)
O(n+k)
O(n^3)

In Quick sort algorithm,constants hidden in T(n lg n) are
Large
Medium
Not known
Small

Quick sort is based on divide and conquer paradigm; we divide the problem on base of pivot element and:
There is explicit combine process as well to conquer the solution.
No work is needed to combine the sub-arrays, the array is already sorted
Merging the subarrays
None of above.

There is relationship between number of back edges and number of cycles in DFS
Both are equal.
Cycles are half of back edges.
Cycles are one fourth of back edges.
There is no relationship between back edges and number of cycle

True False

- Please choose one

You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T ?

(V+E)
V.E
V
E

You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T.?

?(V + E)
?(V E)
?(V)
?(V^2)

What is the time complexity to extract a vertex from the priority queue in Prim's algorithm?

log (V)
V.V
E.E
log (E)

Dijkstra's algorithm :

Has greedy approach to find all shortest paths
Has both greedy and Dynamic approach to find all shortest paths
Has greedy approach to compute single source shortest paths to all other vertices
Has both greedy and dynamic approach to compute single source shortest paths to all other vertices.

What algorithm technique is used in the implementation of Kruskal solution for the MST?

Greedy Technique
Divide-and-Conquer Technique
Dynamic Programming Technique
The algorithm combines more than one of the above techniques

Which is true statement in the following.

Kruskal algorithm is multiple source technique for finding MST.
Kruskal's algorithm is used to find minimum spanning tree of a graph, time complexity of this algorithm is O(EV)
Both of above
Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best Tree edge) when the graph has relatively few edges)

The relationship between number of back edges and number of cycles in DFS is,

Both are equal
Back edges are half of cycles
Back edges are one quarter of cycles
There is no relationship between no. of edges and cycles

Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree edge) when the graph has relatively few edges

True
False

Suppose that a graph G = (V,E) is implemented using adjacency lists. What is the complexity of a breadth-first traversal of G?

O(|V |^2)
O(|V | |E|)

True False

- Please choose one

O(|V |^2|E|)

O(|V | + |E|)

What is generally true of Adjacency List and Adjacency Matrix representations of graphs?
Lists require less space than matrices but take longer to find the weight of an edge (v1,v2)
Lists require less space than matrices and they are faster to find the weight of an edge (v1, v2)
Lists require more space than matrices and they take longer to find the weight of an edge (v1, v2)
Lists require more space than matrices but are faster to find the weight of an edge (v1, v2)

What general property of the list indicates that the graph has an isolated vertex?
There is Null pointer at the end of list.
The Isolated vertex is not handled in list.
Only one value is entered in the list.
There is at least one null list.

A dense undirected graph is:
A graph in which E = O(V^2)
A graph in which E = O(V)
A graph in which E = O(log V)
All items above may be used to characterize a dense undirected graph

In digraph G=(V,E) ;G has cycle if and only if
The DFS forest has forward edge.
The DFS forest has back edge
The DFS forest has both back and forward edge
BFS forest has forward edge

Back edge is:
(u, v) where v is an ancestor of u in the tree.
(u,v) where u is an ancesstor of v in the tree.
(u, v) where v is an predcessor of u in the tree.
None of above

Using ASCII standard the string “abacdaacacwe” will be encoded with _____ bits
64
128
96
120

Cross edge is :
(u, v) where u and v are not ancestor of one another
(u, v) where u is ancesstor of v and v is not descendent of u.
(u, v) where u and v are not ancestor or descendent of one another
(u, v) where u and v are either ancestor or descendent of one another.

Which statement is true?
If a dynamic-programming problem satisfies the optimal-substructure property, then a locally optimal solution is globally optimal.
If a greedy choice property satisfies the optimal-substructure property, then a locally optimal solution is globally optimal.
Both of above
None of above

If you find yourself in maze the better traversel approach will bEA dense undirected graph is:

True False

- Please choose one

A graph in which E = O(V^2)

A graph in which E = O(V)
A graph in which E = O(log V)
All items above may be used to characterize a dense undirected graph

Which is true statement.
Breadth first search is shortest path algorithm that works on un-weighted graphs
Depth first search is shortest path algorithm that works on un-weighted graphs.
Both of above are true.
None of above are true.

Forward edge is:
(u, v) where u is a proper descendent of v in the tree.
(u, v) where v is a proper descendent of u in the tree.
(u, v) where v is a proper ancesstor of u in the tree.
(u, v) where u is a proper ancesstor of v in the tree.

In digraph G=(V,E) ;G has cycle if and only if
The DFS forest has forward edge.
The DFS forest has back edge
The DFS forest has both back and forward edge
BFS forest has forward edge

If you find yourself in maze the better traversel approach will be :
BFS
BFS and DFS both are valid
Level order
DFS

What algorithm technique is used in the implementation of Kruskal solution for the MST?
Greedy Technique
Divide-and-Conquer Technique
Dynamic Programming Technique
The algorithm combines more than one of the above techniques

Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree edge) when the graph has relatively few
True
False

A digraph is strongly connected under what condition?
A digraph is strongly connected if for every pair of vertices u, v e V, u can reach v .
A digraph is strongly connected if for every pair of vertices u, v e V, u can reach v and vice versa.
A digraph is strongly connected if for at least one pair of vertex u, v e V, u can reach v and vice versa.
A digraph is strongly connected if at least one third pair of vertices u, v e V, u can reach v and vice versa.

The relationship between number of back edges and number of cycles in DFS is,
Both are equal
Back edges are half of cycles
Back edges are one quarter of cycles
There is no relationship between no. of edges and cycles

What algorithm technique is used in the implementation of Kruskal solution for the M ST?
Greedy Technique

True False

- Please choose one

Divide-and-Conquer Technique

Dynamic Programming Technique
The algorithm combines more than one of the above techniques

The _____ given by DFS allow us to determine whether the graph contains any cycles. CS502

- Order
- **Time stamps** Page 130
- BFS traversing
- Topological sort

A graph is not connected if every vertex can reach every other vertex. CS502

- True
- **False** Page No. 116

In strong components algorithm, first of all DFS is run for computing finish times of vertices. CS502

- **True** Page No.138
- False

In strong components algorithm, first of all DFS is run for computing finish times of vertices. CS502

- [d[u], f[u]]⊆[d[v], f[v]]
- [d[u], f[u]]⊇[d[v], f[v]]
- **unrelated** Page No.129
- Disjoint

For traversing graphs, Breadth-first search can be visualized as a wave front propagating inwards towards root (or source) node. CS502

- True
- **False** Page No.117

Digraphs are not used in communication and transportation networks. CS502

- True
- **False** Page No.135

You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T.? CS502 ?

True False

- Please choose one

- **(V + E)** Page No.138
- V E
- V
- E

In computing the strongly connected components of a digraph, vertices of the digraph are not partitioned into subsets. CS502

- True
- **False** Page No.135

There are no _____ edges in undirected graph. CS502

- Forward
- Back
- Cross
- **Both Forward and Back** Page No. 130

We say that two vertices u and v are mutually not reachable if u can reach v and vice versa. CS502

- **True** Page No. 135
- False

- There is relationship between number of back edges and number of cycles in DFS Select correct option:
- Both are equal.
- Cycles are half of back edges.
- Cycles are one fourth of back edges.
- **There is no relationship between back edges and number of cycles**. **(Correct)**
-
-
- In strong components algorithm, the form of graph is used in which all the vertices of original graph G have been reversed in direction. Select correct option:
- **True** **(Correct)**
- False
-

True False

- Please choose one

- In Kruskal's algorithm, the next edge is added to viable set A, if its adding does not induce a/an _____ . Select correct option:
-
- Vertex
- Edge
- **Cycle (Correct)**
- Tree
-
-
- For undirected graph, there is no distinction between forward and back edges. Select correct option:
- **True (Correct)**
- False
-
- You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T ? Select correct option:
- **(V+E) (Correct)**
- V.E
- V
- E
-
- There exist a unique path between any _____ vertices of a free tree. Select correct option:
- One
- **Two (Correct)**
- Three
- All
-

True False

- Please choose one

- A digraph is strongly connected under what condition? Select correct option:
-
- A digraph is strongly connected if for every pair of vertices u, v e V, u can reach v .
- **A digraph is strongly connected if for every pair of vertices u, v e V, u can reach v and vice versa. (Correct)**
- A digraph is strongly connected if for at least one pair of vertex u, v e V, u can reach v and vice versa.
- A digraph is strongly connected if at least one third pair of vertices u, v e V, u can reach v and vice versa.
-
-
- If u and v are mutually reachable in G, then in the graph formed by reversing all the edges, these vertices are not reachable. Select correct option:
- True
- **False (Correct)**
-
-
- In Prim's algorithm, at any time, the subset of edges A forms a single forest. Select correct option:
- True
- **False (Correct)**
-
- In digraph G=(V,E) ;G has cycle if and only if
- The DFS forest has forward edge.
- **The DFS forest has back edge**
- The DFS forest has both back and forward edge
- BFS forest has forward edge

True False

- Please choose one

Question No: 1 (Marks: 1) - Please choose one

In_____ algorithm, at anytime, the subset of edges A forms a single tree.

Kruskal's
Prim's
Both
None

Question No: 2 (Marks: 1) - Please choose one

According to parenthesis lemma, vertex u is unrelated to v vertex if and only if [d[u], f[u]] and [d[v], f[v]] are disjoint.

True
False

Question No: 3 (Marks: 1) - Please choose one

A free tree with n vertices have exactly n+1 edges.

True
Fale

True False

- Please choose one

Question No: 4 (Marks: 1) - Please choose one

For undirected graph, there is no distinction between forward and back edges.

True
Fale

Question No: 5

In computing the strongly connected components of a digraph, vertices of the digraph are not partitioned into subsets.

True
False

Question No: 6 (Marks: 1) - Please choose one

What is the time complexity to extract a vertex from the priority queue in Prim's algorithm?

log (V)
V.V
E.E
log (E)

True False

- Please choose one

Question No: 7 (Marks: 1) - Please choose one

What is true statement?

Breadth first search is shortest path algorithm that works on un-weighted graphs
Depth first search is shortest path algorithm that works on un-weighted graphs
Both of above are true
None of above are true

Question No: 8 (Marks: 1) - Please choose one

Networks are_____ in the sense that it is possible from any location in the network to reach any other location in the digraph.

Complete
Incomplete
Not graphs
Transportation

Question No: 9 (Marks: 1) - Please choose one

In Generic approach determining of Greedy MST, we maintain a subset A of are_____

Edges
Vertices
Cycles
Paths

True False

- Please choose one

Question No: 10 (Marks: 1)

There are no_____ edges in undirected graph.

Forward
Back
Cross
Both forward and back

Question No: 11 (Marks: 1) - Please choose one

If you find yourself in maze the better traversal approach will be:

BFS
BFS and DFS both are valid
Level order
DFS

Question No: 12 (Marks: 1) - Please choose one

In strong components algorithm, the form of graph is used in which all the vertices of original graph G have been reversed in direction.

True
False

True False

- Please choose one

Question No: 13 (Marks: 1) - Please choose one

What algorithm technique is used in the implementation of Kruskal solution for the MST?

Greedy Technique
Divide-and-Conquer Technique
Dynamic Programming Technique
The algorithm combines more than one of the above techniques

Question No: 14 (Marks: 1) - Please choose one

In Kruskal's algorithm, the next edge is added to viable set A, if its adding does not induce a cycle.

True False

Question No: (Marks: 1) - Please choose one

15

There exists a unique path between any_____ vertices of a free tree.

One
Two
Three
All

Question No: 16 (Marks: 1) - Please choose one

Computing the strongly connected components of a digraph is a generalization of the problem to determine whether a digraph is strongly connected or not.

True
False

Question No: 17 (Marks: 1) - Please choose one

If a vertex is a descendent of vertex u, then v's start-finish interval is contained within u's start-finish interval.

True
False

True False

- Please choose one

Question No: 18 (Marks: 1) - Please choose one

The_____ given by DFS allow us to determine whether the graph contains any cycles.

Order
Time stamps
BFS traversing
Topological sort

Question No: 19 (Marks: 1) - Please choose one

Networks are complete in the sense that it is possible from any location in the network to reach any other location in the digraph.

Question No: 20 (Marks: 1)

There are no_____ edges in undirected graph.

Forward
Back
Cross
Both forward and back

Question No: 21 (Marks: 1) - Please choose one

True False

- Please choose one

You have an adjacency list for G, what is the time complexity to compute Graph transpose G^T.?

? (V + E)
? (V E)
? (V)
? (V^2)

Question No: 22 (Marks: 1) - Please choose one

There are no_____ edges in undirected graph.

Forward
Back
Cross
Both forward and back

Question No: 23 (Marks: 1) - Please choose one

In Prim's algorithm, at anytime, the subset of edges A forms a single_____.

Vertex
Forest
Tree
Graph

True False

- Please choose one

Question No: 24 (Marks: 1) - Please choose one

Kruskal's algorithm works by adding vertices in increasing order of weight (lightest edge first).

25

Runtime complexity of Prim's algorithm is _____.

V log V
E log V
log V
None of the above

Question No: 26 (Marks: 1) - Please choose one

According to parenthesis lemma, vertex u is an ancestor of v vertex if and only if;

[d[u], f[u]] ⊆ [d[v], f[v]]
[d[u], f[u]] ⊇ [d[v], f[v]]
Unrelated
Disjoint

Question No: 27 (Marks: 1) - Please choose one

In Kruskal's algorithm, the next _____ is not added to viable set A, if its adding induce a/an

True False

- Please choose one

cycle.

Vertex
Edge
Cycle
Tree

Question No: 28 (Marks: 1) - Please choose one

In Prim's algorithm, we start with the _____ vertex r; it can be any vertex.

First
Leaf
Mid
Root

Question No: 29 (Marks: 1) - Please choose one

A free tree with n vertices has exactly n+1 edges.

True
False

True False

(Marks: 1) - Please choose one

Question No: 30

There exists a unique path between any _____ vertices of a free tree.

One
Two
Three
All

Question No: 31 (Marks: 1) - Please choose one

The tricky part of the _____ algorithm is how to detect whether the addition of an edge will create a cycle in viable set A.

Kruskal's
Prim's
Both
None

Question No: 32 (Marks: 1) - Please choose one

In Prim's algorithm, we start with the root vertex r; it can be any vertex.

True
False

Question No: -

Question No: 33 (Marks: 1) - Please choose one

The relationship between number of back edges and number of cycles in DFS is,

Both are equal
Back edges are half of cycles
Back edges are one quarter of cycles
There is no relationship between no. of edges and cycles

Question No: 34 (Marks: 1) - Please choose one

If you find yourself in maze the better traversal approach will be:

BFS
BFS and DFS both are valid
Level order
DFS

35 Please choose one

According to parenthesis lemma, vertex u is an ancestor of v vertex if and only if;

[d[u], f[u]] ⊆ [d[v], f[v]]
[d[u], f[u]] ⊇ [d[v], f[v]]
Unrelated
Disjoint

Question No: -

Question No: 36 (Marks: 1) - Please choose one

We say that two vertices u and v are mutually not reachable if u can reach v and vice versa.

True
False

Question No: 37 (Marks: 1) - Please choose one

In Generic approach determining of Greedy MST, we maintain a subset A of are_____

Edges
Vertices
Cycles
Paths

Question No: 38 (Marks: 1) - Please choose one

Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree edge) when the graph has relatively few edges.

True
False

Question No: -

Question No: 39 (Marks: 1) - Please choose one

Digraphs are not used in communication and transportation networks.

True
False

40 (Marks: 1) Please choose one

We say that two vertices u and v are mutually not reachable if u can reach v and vice versa.

True
False

Question No: 41 (Marks: 1) - Please choose one

Runtime complexity of Prim's algorithm is _____.

V log V **E**
log V log
V
None of the above

Question No: -

Question No: 42 (Marks: 1) - Please choose one

In Prim's algorithm, we start with the root vertex r; it can be any vertex.

True
False

Question No: 43 (Marks: 1) - Please choose one

Networks are _____ in the sense that it is possible from any location in the network to reach any other location in the digraph.

Complete
Incomplete
Not graphs
Transportation

Question No: 44 (Marks: 1) - Please choose one

Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree edge) when the graph has relatively few edges.

True False

Question No: -

45

In strong components algorithm, vertices are sorted in_____ order of finish times.

Any
Increasing
Decreasing
None

Question No: 46 (Marks: 1) - Please choose one

In Kruskal's algorithm, at anytime, the subset of edges A forms a single tree.

True
False

Question No: 47 (Marks: 1) - Please choose one

If a subset of edges A is viable for building MST, it can not contain a/an_____.

Vertex
Edge
Cycle
Graph

Question No: -

Question No: 48 (Marks: 1) - Please choose one

In Timestamped DFS-cycles lemma, if edge (u,v) is a tree, forward or cross edge, then_____.

{\text{f[u]}} < {\text{f[v]}} {\text{f[u]}} >
{\text{f[v]}}
f[u] ≤ f[v]
f[u] ≥ f[v]

Question No: 49 (Marks: 1) - Please choose one

Strongly connected components are not affected by reversal of all edges in terms of vertices reachability.

True False **50**
If u and v are mutually reachable in G, then in the graph formed by reversing all the edges, these vertices are not reachable.

True
False

Question No: 51 (Marks: 1) - Please choose one

Forward edge is:

(u, v) where u is a proper descendent of v in the tree.
(u, v) where v is a proper descendent of u in the tree.
(u, v) where v is a proper ancestor of u in the tree.
(u, v) where u is a proper ancestor of v in the tree.

Question No: -

Question No: 52 (Marks: 1) - Please choose one

According to parenthesis lemma, vertex u is an ancestor of v vertex if and only if;

[d[u], f[u]] ⊆ [d[v], f[v]]
[d[u], f[u]] ⊇ [d[v], f[v]]
Unrelated
Disjoint

Question No: 53 (Marks: 1) - Please choose one

In Timestamped DFS-cycles lemma, if edge (u,v) is a tree, forward or cross edge, then_____.

{\text{f[u]}} < {\text{f[v]}} {\text{f[u]}} >
{\text{f[v]}}
f[u] ≤ f[v]
f[u] ≥ f[v]

Question No: 54 (Marks: 1) - Please choose one

As the Kruskal's algorithm runs, the edges in viable set A induce a_____ on the vertices.

Set
Graph
Tree
Forest

55

Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best tree edge) when the

Question No: -

graph has relatively few edges.

True
False

Question No: 56 (Marks: 1) - Please choose one

Runtime complexity of Prim's algorithm is _____.

V log V E log V
log V
None of the above

Question No: 57 (Marks: 1) - Please choose one

Kruskal's algorithm works by adding _____vertices in increasing order of weight (lightest edge first).

Vertices
Edges
Trees
Weights

Question No: 58 (Marks: 1) - Please choose one

In strong components algorithm, the form of graph is used in which all the vertices of original graph G have been reversed in direction.

Question No: -

True

False