Question # 1 (Start time: 04:49:47 PM) Total Marks: 1
A free tree with n vertices have exactly _____ edges.
Select correct option:

- ★ n
- ★ n + 1
- ★ **n - 1 (Page No. No. 142)**
- ★ 1

Question # 2 (Start time: 04:50:38 PM) Total Marks: 1
In Timestamped DFS-cycles lemma, if edge (u, v) is a back edge, then _____
Select correct option:

- ★ f[u] ≥ f[v]
- ★ **f[u] ≤ f[v] (Page No. No. 130)**
- ★ f[u] = f[v]
- ★ f[u] \geqslant f[v]

Question # 3 (Start time: 04:52:12 PM) Total Marks: 1
In Prim's algorithm, at any time, the subset of edges A forms a single _____.
Select correct option:

- ★ Vertex
- ★ Forest
- ★ **Tree (Page No. No. 151)**
- ★ Graph

Question # 4 (Start time: 04:53:18 PM) Total Marks: 1
Back edge is:
Select correct option:

- ★ **(u, v) where v is an ancestor of u in the tree. (Page No. No. 128)**
- ★ (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

Question # 5 (Start time: 04:53:57 PM) Total Marks: 1
The tricky part of the _____ algorithm is how to detect whether the addition of an edge will create a cycle in viable set A.
Select correct option:

- ★ **Kruskal's (Page No. No. 147)**

- ★ Prim's
- ★ Both
- ★ None

Question # 6 (Start time: 04:54:38 PM) Total Marks: 1
What algorithm technique is used in the implementation of Kruskal solution for the MST?
Select correct option:

- ★ **Greedy Technique (Page No. No. 142)**
- ★ Divide-and-Conquer Technique
- ★ Dynamic Programming Technique
- ★ The algorithm combines more than one of the above techniques i.e. Divide-and-Conquer and Dynamic Programming

Question # 7 (Start time: 04:55:05 PM) Total Marks: 1
Networks are _____ in the sense that it is possible from any location in the network to reach any other location in the digraph.
Select correct option:

- ★ **Complete (Page No. No. 155)**
- ★ Incomplete
- ★ Not graphs
- ★ Transportation

Question # 8 (Start time: 04:55:59 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 (Page No. No. 155)**
- ★ False

Question # 9 (Start time: 04:57:00 PM) Total Marks: 1
Which is true statement in the following.
Select correct option:

- ★ 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.**

Question # 10 (Start time: 04:57:46 PM) Total Marks: 1
Timestamp structure of _____ is used in determining the strong components of a digraph.
Select correct option:

- ★ DFS
- ★ BFS
- ★ **Both DFS & BFS**
- ★ None

Question # 11 (Start time: 05:37:42 PM) Total Marks: 1
In Prim's algorithm, we start with the root vertex r; it can be any vertex.
Select correct option:

- ★ **True (Page No. No. 149)**
- ★ False

Question # 12 (Start time: 05:38:35 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)**
- ★ ? (V E)
- ★ ? (V)
- ★ ? (V^2)

Question # 13 (Start time: 05:39:40 PM) Total Marks: 1
Equivalence relation partitions the vertices into _____ classes of mutually reachable vertices and these are the strong components
Select correct option:

- ★ Variance
- ★ **Equivalence (Page No. No. 136)**
- ★ Non equivalence
- ★ Non classes

Question # 14 (Start time: 05:40:16 PM) Total Marks: 1
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

Question # 15 (Start time: 05:41:08 PM) Total Marks: 1
Kruskal's algorithm works by adding vertices in increasing order of weight (lightest edge first).
Select correct option:

- ★ True
- ★ **False (Page No. No. 147)**

Question # 16 (Start time: 05:41:50 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.

- ★ **True**
- ★ False

Question # 17 (Start time: 05:42:45 PM) Total Marks: 1
In Kruskal's algorithm, the next edge is added to viable set A, if its adding does not induce a cycle.

- ★ True
- ★ **False**

Question # 18 (Start time: 05:43:48 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.

- ★ True
- ★ **False**

Question # 19 (Start time: 05:44:34 PM) Total Marks: 1
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.

Question # 20 (Start time: 05:45:27 PM) Total Marks: 1
A free tree with n vertices have exactly n+1 edges.

- ★ True
- ★ **False**

Question # 21 (Start time: 10:24:21 PM) Total Marks: 1
The _____ given by DFS allow us to determine whether the graph contains any cycles.
Select correct option:

- ★ Order

- ★ **Time stamps**
- ★ BFS traversing
- ★ Topological sort

Question # 22 (Start time: 06:32:34 PM) Total Marks: 1
Adding any edge to a free tree creates a unique cycle.
Select correct option:

- ★ **True (Page No. 142)**
- ★ False

Question # 23 (Start time: 06:33:21 PM) Total Marks: 1
What is the time complexity to extract a vertex from the priority queue in Prim's algorithm?
Select correct option:

- ★ **log (V) (Page No. 152)**
- ★ V.V
- ★ E.E
- ★ log (E)

Question # 24 (Start time: 06:34:52 PM) Total Marks: 1
By breaking any edge on a cycle created in free tree, the free _____ is restored.
Select correct option:

- ★ Edge
- ★ **Tree (Page No. 142)**
- ★ Cycle
- ★ Vertex

Question # 25 (Start time: 06:37:14 PM) Total Marks: 1
We say that two vertices u and v are mutually _____ if u can reach v and vice versa.
Select correct option:

- ★ Crossed
- ★ Forward
- ★ **Reachable (Page No. 135)**
- ★ Not Reachable

Question # 26 (Start time: 06:42:45 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]] (Page No. 129)**
★ [d[u], f[u]] ⊇ [d[v], f[v]]
★ Unrelated
★ Disjoint

Question # 27 (Start time: 06:43:51 PM) Total Marks: 1
There are no _____ edges in undirected graph.
Select correct option:

★ Forward
★ Back
★ **Cross (Page No. 130)**
★ Both forward and back

Question # 28 (Start time: 06:46:27 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 (Page No. 131)**
★ The DFS forest has both back and forward edge
★ BFS forest has forward edge

Question # 29 (Start time: 06:47:40 PM) Total Marks: 1
Digraphs are not used in communication and transportation networks.
Select correct option:

★ True
★ **False (Page No. 135)**

Question # 30 (Start time: 06:48:21 PM) Total Marks: 1
In Prim's algorithm, we start with the _____ vertex r; it can be any vertex.
Select correct option:

★ First
★ Leaf
★ Mid
★ **Root (Page No. 149)**

Question # 31 (Start time: 06:48:53 PM) Total Marks: 1
In Generic approach determining of Greedy MST, we maintain a subset A of _____ .

Select correct option:

- ★ **Edges (Page No. 143)**
- ★ Vertices
- ★ Cycles
- ★ Paths

Question # 32 (Start time: 06:50:37 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.**

Question # 33 (Start time: 06:54:42 PM) Total Marks: 1
For undirected graph, there is no distinction between forward and back edges.
Select correct option:

- ★ **True (Page No. 130)**
- ★ False

Question # 34 (Start time: 07:00:59 PM) Total Marks: 1
In computing the strongly connected components of a digraph, vertices of the digraph are _____ into subsets.
Select correct option:

- ★ Joined
- ★ **Partitioned (Page No. 135)**
- ★ Deleted
- ★ Created

Question # 35 (Start time: 09:17:53 PM) Total Marks: 1
Using ASCII code, each character is represented by a fixed-length code word of _____ bits per character.
Select correct option:

- ★ 4
- ★ 6
- ★ **8 (Page No. 99)**
- ★ 10

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

In Knapsack Problem, the thief's goal is to put items in the bag such that the _____ of the items does not exceed the limit of the bag.

- ★ **Value (Page No. 91)**
- ★ Weight
- ★ Length
- ★ Balance

Question # 36 (Start time: 09:11:49 PM) Total Marks: 1
In Activity selection (using Greedy approach), intuitively _____.
Select correct option:

- ★ Short activities are not preferable
- ★ There are always short activities as input
- ★ **We do not like long activities (Page No. 105)**
- ★ It does not matter about the length of activities

Question # 37 (Start time: 09:12:32 PM) Total Marks: 1
The prefix code generated by Huffman algorithm _____ the expected length of the encoded string.
Select correct option:

- ★ **Minimizes (Page No. 102)**
- ★ Balances
- ★ Maximizes
- ★ Keeps Constant

Question # 38 (Start time: 09:13:50 PM) Total Marks: 1
In a digraph, the number of edges coming in of a vertex is not called the in-degree of that vertex.
Select correct option:

- ★ True
- ★ **False (Page No. 114)**

Question # 39 (Start time: 09:14:38 PM) Total Marks: 1
Graphs are important _____ model for many application problems.
Select correct option:

- ★ Unsystematic
- ★ **Mathematical (Page No. 113)**
- ★ Haphazard
- ★ Unpredictable

Question # 40 (Start time: 09:15:40 PM) Total Marks: 1
In Activity scheduling algorithm, each activity is represented by a _____
Select correct option:

- ★ Circle
- ★ Square
- ★ Triangle
- ★ **Rectangle (Page No. 106)**

Question # 41 (Start time: 09:16:46 PM) Total Marks: 1
In _____ algorithm, you hope that by choosing a local optimum at each step, you will end up at a global optimum.
Select correct option:

- ★ Simple
- ★ Non Greedy
- ★ **Greedy (Page No. 97)**
- ★ Brute force

Question # 42 (Start time: 09:17:21 PM) Total Marks: 1
In general, a graph G = (V,E) consists of a _____ and E, a binary relation on V called edges.
Select correct option:

- ★ Infinite set of vertices V
- ★ Infinite set of nodes
- ★ **Finite set of vertices V (Page No. 113)**
- ★ Infinite set of objects

Question # 43 (Start time: 09:18:20 PM) Total Marks: 1
In general, the Activity selection problem is to select a _____
Select correct option:

- ★ minimum-size set of interfering activities
- ★ **maximum-size set of mutually non-interfering activities (Page No. 105)**
- ★ maximum-size set of interfering activities
- ★ minimum-size set of mutually non-interfering activities

Question # 44 (Start time: 09:18:59 PM) Total Marks: 1
Breadth-first search is not a popular algorithm technique used for traversing graphs.
Select correct option:

- ★ True

★ **False**

Question # 45 (Start time: 10:02:47 PM) Total Marks: 1

A vertex a is not adjacent to vertex b if there is an edge from a to b.

Select correct option:

★ True

★ **False (Page No. 113)**

Question # 46 (Start time: 10:03:54 PM) Total Marks: 1

A number of lectures are to be given in a single lecture hall. Optimum scheduling for this is an example of Activity selection.

Select correct option:

★ **True (Page No. 105)**

★ False

Question # 47 (Start time: 10:04:53 PM) Total Marks: 1

In Activity Selection, we say that two activities are non-interfering if their start-finish interval _____ overlap.

Select correct option:

★ Do

★ **Do not (Page No. 105)**

★ Sometimes

★ Once

Question # 48 (Start time: 10:06:32 PM) Total Marks: 1

In Activity scheduling algorithm, as base case if there are no activities then Greedy algorithm _____

Select correct option:

★ cannot be optimized

★ is solved using Recursion

★ is transformed into Dynamic Programming

★ **is trivially optimal (Page No. 109)**

Question # 49 (Start time: 10:07:13 PM) Total Marks: 1

Graphs can be represented by an adjacency list.

Select correct option:

★ **True (Page No. 120)**

★ False

Question # 50 (Start time: 10:08:10 PM) Total Marks: 1

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

- ★ True
- ★ **False (Page No. 117)**

Question # 51 (Start time: 10:08:43 PM) Total Marks: 1
In a digraph, the number of edges coming out of a vertex is not called the out-degree of that vertex.
Select correct option:

- ★ True
- ★ **False (Page No. 114)**

Question # 52 (Start time: 10:09:36 PM) Total Marks: 1
In Activity scheduling algorithm, the width of a rectangle _____
Select correct option:

- ★ Is always ignored
- ★ Directs towards recursion
- ★ Should be maximized
- ★ **Indicates the duration of an activity (Page No. 106)**

Question # 53 (Start time: 10:58:41 PM) Total Marks: 1
In Huffman Encoding, the characters with smallest probabilities are placed at the _____ depth of the tree.
Select correct option:

- ★ Minimum
- ★ Average
- ★ **Maximum (Page No. 102)**
- ★ Root

Question # 54 (Start time: 11:00:35 PM) Total Marks: 1
A greedy algorithm does not work in phases.
Select correct option:

- ★ True
- ★ **False (Page No. No. 97)**

Question # 55 (Start time: 11:03:39 PM) Total Marks: 1
Dynamic Programing approach solves both 0/1 Knapsack and Fractional Knapsack problems.
Select correct option:

- ★ **True**

★ False

Question # 56 (Start time: 11:04:22 PM) Total Marks: 1
The activity scheduling is a simple scheduling problem for which the greedy algorithm approach provides a/an _____solution.
Select correct option:

★ Simple
★ Sub optimal
★ **Optimal (Page No. 105)**
★ Non optimal

Question # 57 (Start time: 11:19:34 PM) Total Marks: 1
Graphs cannot be traversed by brute-force technique.
Select correct option:

★ **True**
★ False

Question # 58 (Start time: 11:20:38 PM) Total Marks: 1
A graph is not connected if every vertex can reach every other vertex.
Select correct option:

★ True
★ **False (Page No. 116)**

Question # 59 (Start time: 11:21:21 PM) Total Marks: 1
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)**
★ < Sum of out-degree(v)
★ > Sum of out-degree(v)

Question # 60 (Start time: 11:21:57 PM) Total Marks: 1
_____approach is optimal for the fractional knapsack problem.
Select correct option:

★ Divide and Conquer
★ Dynamic Programming
★ **Greedy algorithm (Page No. 110)**
★ Brute force

Question # 61 (Start time: 11:24:05 PM) Total Marks: 1
In general in comparison with Fractional Knapsack problem, _____
Select correct option:

- ★ 0-1 knapsack problem is very easy to solve
- ★ 0-1 knapsack problem is hard to solve
- ★ Both are easy to solve
- ★ We cannot compare them

Question # 62 (Start time: 10:10:00 PM) Total Marks: 1
In Activity scheduling algorithm, the time is dominated by sorting of the activities by _____
Select correct option:

- ★ start times
- ★ **finish times (Page No. 106)**

Question # 63 (Start time: 10:10:54 PM) Total Marks: 1
In Huffman encoding, for a given message string, the frequency of occurrence (relative probability) of each character in the message is determined last.
Select correct option:

- ★ True
- ★ False

Question # 64 (Start time: 10:11:32 PM) Total Marks: 1
In Huffman encoding, the _____is the number of occurrence of a character divided by the total characters in the message.
Select correct option:

- ★ Counting
- ★ Parsing
- ★ **Probability (Page No. 100)**
- ★ Weight

Question # 65 (Start time: 10:12:27 PM) Total Marks: 1
In _____ problem, we want to find the best solution.
Select correct option:

- ★ Minimization
- ★ Averaging
- ★ **Optimization (Page No. 97)**
- ★ Maximization

Question # 66 (Start time: 10:12:56 PM) Total Marks: 1
Bag is a _____
Select correct option:

- ★ type of algorithm
- ★ **data structure (Page No. 119)**
- ★ program
- ★ compiler

Question # 67 (Start time: 10:43:12 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 (Page No. 149)**
- ★ Both
- ★ None

Question # 68 (Start time: 10:42:30 PM) Total Marks: 1
Adding any edge to a free tree creates a unique _____ .
Select correct option:

- ★ Vertex
- ★ Edge
- ★ **Cycle (Page No. 142)**
- ★ Strong component

Question # 69 (Start time: 10:41:20 PM) Total Marks: 1
In computing the strongly connected components of a digraph, vertices of the digraph are not partitioned into subsets.
Select correct option:

- ★ True
- ★ **False (Page No. 135)**

Question # 70 (Start time: 10:41:02 PM) Total Marks: 1
Strongly connected components are not affected by reversal of all edges in terms of vertices reachability.
Select correct option:

- ★ **True (Page No. 139)**
- ★ False

Question # 71 (Start time: 10:39:57 PM) Total Marks: 1

In Prim's algorithm, we will make use of priority _____.
Select correct option:

- ★ Stack
- ★ **Queue (Page No. 150)**
- ★ Array
- ★ Graph

Question # 72 (Start time: 10:38:26 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 (Page No. 138)**
- ★ Both edges & vertices
- ★ None of the above

Question # 73 (Start time: 10:37:05 PM) Total Marks: 1
In Kruskal's algorithm, the next _____ is not added to viable set A, if its adding induce a/an cycle.
Select correct option:

- ★ Vertex
- ★ Edge
- ★ Cycle
- ★ Tree

Question # 74 (Start time: 10:36:24 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. (Page no. 129)**
- ★ (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 # 75 (Start time: 10:28:46 PM) Total Marks: 1
Kruskal's algorithm works by adding _____ in increasing order of weight (lightest edge first).
Select correct option:

- ★ Vertices
- ★ **Edges (Page No. 147)**

- ★ Trees
- ★ Weights

Question # 76 (Start time: 10:29:13 PM) Total Marks: 1
There exist a unique path between any two vertices of a free tree.
Select correct option:

- ★ **True (Page No. 142)**
- ★ False

Question # 77 (Start time: 09:29:14 PM) Total Marks: 1
In undirected graph, by convention all the edges are called _____ edges.
Select correct option:

- ★ Forward
- ★ **Back (Page No. 130)**
- ★ Cross
- ★ Both forward and back

Question # 78 (Start time: 09:30:02 PM) Total Marks: 1
In strong components algorithm, first of all DFS is run for getting _____ times of vertices.
Select correct option:

- ★ Start
- ★ Finish
- ★ Both start & finish
- ★ None of the above

Question # 79 (Start time: 09:31:24 PM) Total Marks: 1
If you find yourself in maze the better traversal approach will be :
Select correct option:

- ★ BFS
- ★ BFS and DFS both are valid
- ★ Level order
- ★ DFS

Question # 80 (Start time: 09:37:01 PM) Total Marks: 1
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

★ False

Question # 81 (Start time: 09:38:11 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**
★ False

Question No: 82 (Marks: 1) - Please choose one
An optimization problem is one in which you want to find,

★ Not a solution
★ An algorithm
★ Good solution
★ **The best solution (Page No. 97)**

Question No: 83 (Marks: 1) - Please choose one
The greedy part of the Huffman encoding algorithm is to first find two nodes with larger frequency.

★ True
★ **False (Page No. 100)**

Question No: 84 (Marks: 1) - Please choose one
The code words assigned to characters by the Huffman algorithm have the property that no code word is the postfix of any other.

★ True
★ **False (Page No. 101)**

Question No: 85 (Marks: 1) - Please choose one
Huffman algorithm uses a greedy approach to generate a postfix code T that minimizes the expected length B (T) of the encoded string.

★ True
★ **False (Page No. 102)**

Question No: 86 (Marks: 1) - Please choose one
Shortest path problems can be solved efficiently by modeling the road map as a graph.

★ **True (Page No. 153)**
★ False

Question No: 87 (Marks: 1) - Please choose one

Dijkestra's single source shortest path algorithm works if all edges weights are non-negative and there are negative cost cycles.

- ★ True
- ★ **False (Page No. 159)**

Question No: 88 (Marks: 1) - Please choose one
Bellman-Ford allows negative weights edges and negative cost cycles.

- ★ True
- ★ **False (Page No. 159)**

Question No: 89 (Marks: 1) - Please choose one
The term "coloring" came form the original application which was in architectural design.

- ★ True
- ★ **False (Page No. 176)**

Question No: 90 (Marks: 1) - Please choose one
In the clique cover problem, for two vertices to be in the same group, they must be adjacent to each other.

- ★ **True (Page No. 176)**
- ★ False

Question No: 91 (Marks: 1) - Please choose one
Dijkstra's algorithm is operates by maintaining a subset of vertices

- ★ **True (Page No. 155)**
- ★ False

Question No: 92 (Marks: 1) - Please choose one
The difference between Prim's algorithm and Dijkstra's algorithm is that Dijkstra's algorithm uses a different key.

- ★ **True (Page No. 156)**
- ★ False

Question No: 93 (Marks: 1) - Please choose one
After partitioning array in Quick sort, pivot is placed in a position such that

- ★ **Values smaller than pivot are on left and larger than pivot are on right (Page No. 48)**
- ★ Values larger than pivot are on left and smaller than pivot are on right
- ★ Pivot is the first element of array

★ Pivot is the last element of array

Question No: 94 (Marks: 1) - Please choose one
Merge sort is stable sort, but not an in-place algorithm

★ **True (Page No. 54)**
★ False

Question No: 95 (Marks: 1) - Please choose one
In counting sort, once we know the ranks, we simply _____ numbers to their final positions in an output array.

★ Delete
★ **copy (Page No. 57)**
★ Mark
★ arrange

Question No: 96 (Marks: 1) - Please choose one
Dynamic programming algorithms need to store the results of intermediate sub-problems.

★ **True (Page No. 75)**
★ False

Question No: 97 (Marks: 1) - Please choose one
A p × q matrix A can be multiplied with a q × r matrix B. The result will be a p × r matrix C. There are (p . r) total entries in C and each takes _____ to compute.

★ **(q) (Page No. 84)**
★ (1)
★ (n2)
★ (n3)

Question No: 98 (Marks: 1) - Please choose one
Which of the following is calculated with big o notation?

★ Lower bounds
★ **Upper bounds (Page No. 25)**
★ Both upper and lower bound
★ Medium bounds

Question No: 99 (Marks: 1) - Please choose one
One of the clever aspects of heaps is that they can be stored in arrays without using any_____.

★ **Pointers (Page No. 40)**

- ★ constants
- ★ variables
- ★ functions

Question No: 100 (Marks: 1) - Please choose one
Merge sort requires extra array storage,

- ★ **True (Page No. 54)**
- ★ False

Question No: 101 (Marks: 1) - Please choose one
Non-optimal or greedy algorithm for money change takes_____

- ★ **O(k) (Page No. 99)**
- ★ O(kN)
- ★ O(2k)
- ★ O(N)

Question No: 102 (Marks: 1) - Please choose one
The Huffman codes provide a method of encoding data inefficiently when coded using ASCII standard.

- ★ True
- ★ **False (Page No. 99)**

Question No: 103 (Marks: 1) - Please choose one
Using ASCII standard the string abacdaacac will be encoded with _____ bits.

- ★ **80 (Page No. 99)**
- ★ 160
- ★ 320
- ★ 100

Question No: 104 (Marks: 1) - Please choose one
Using ASCII standard the string abacdaacac will be encoded with 160 bits.

- ★ True
- ★ **False (Page No. 99)**

Question No: 104 (Marks: 1) - Please choose one
Huffman algorithm uses a greedy approach to generate an antefix code T that minimizes the expected length B(T) of the encoded string.

- ★ True

★ **False (Page No. 102)**

Question No: 105 (Marks: 1) - Please choose one
Depth first search is shortest path algorithm that works on un-weighted graphs.

★ True
★ **False (Page No. 153)**

Question No: 106 (Marks: 1) - Please choose one
Floyd-Warshall algorithm is a dynamic programming algorithm; the genius of the algorithm is in the clever recursive formulation of the shortest path problem.

★ **True (Page No. 162)**
★ Flase

Question No: 107 (Marks: 1) - Please choose one
The term coloring came from the original application which was in map drawing.

★ **True (Page No. 176)**
★ False

Question No: 108 (Marks: 1) - Please choose one
In Knapsack Problem, value and weight both are to be under consideration.

★ **True (Page No. 91)**
★ False

Question No: 109 (Marks: 1) - Please choose one
Time complexity of DP based algorithm for computing the minimum cost of chain matrix Multiplication is _____

★ log n
★ n
★ n2
★ **n3 (Page No. 90)**

Question No: 110 (Marks: 1) - Please choose one
In DP based solution of knapsack problem, to compute entries of V we will imply a/an _____ approach.

★ Subjective
★ **Inductive (Page No. 93)**
★ Brute force
★ Combination

Question No: 111 (Marks: 1) - Please choose one

In _____ based solution of knapsack problem, we consider 2 cases, Leave object Or Take object.

- ★ Brute force
- ★ **Dynamic programming (Page No. 93)**

Question No: 112 (Marks: 1) - Please choose one
A greedy algorithm sometimes works well for optimization problems.

- ★ **True (Page No. 97)**
- ★ False

Question No: 113 (Marks: 1) - Please choose one
In Huffman encoding, frequency of each character can be determined by parsing the message and _____ how many times each character (or symbol) appears.

- ★ Printing
- ★ Incrementing
- ★ **Counting (Page No. 100)**
- ★ Deleting

Question No: 114 (Marks: 1) - Please choose one
The Huffman codes provide a method of _____ data efficiently.

- ★ Reading
- ★ **Encoding (Page No. 99)**
- ★ Decoding
- ★ Printing

Question No: 115 (Marks: 1) - Please choose one
Greedy algorithm can do very poorly for some problems.

- ★ **True (Page No. 97)**
- ★ False

Question No: 116 (Marks: 1) - Please choose one
In the clique cover problem, for two vertices to be in the same group, they must be_____each other.

- ★ Apart from
- ★ Far from
- ★ Near to
- ★ **Adjacent to (Page No. 176)**

Question No: 117 (Marks: 1) - Please choose one

Fixed-length codes may not be efficient from the perspective of _____the total quantity of data.

- ★ **Minimizing (Page No. 99)**
- ★ Averaging
- ★ Maximizing
- ★ Summing

Question No: 118 (Marks: 1) - Please choose one
In greedy algorithm, at each phase, you take the_____ you can get right now, without regard for future consequences.

- ★ Worst
- ★ Minimum
- ★ Good
- ★ **Best (Page No. 97)**

Question No: 119 (Marks: 1) - Please choose one
If a problem is in NP-complete, it must also be in NP.

- ★ **True (Page No. 178)**
- ★ False

Question No: 120 (Marks: 1) - Please choose one
If there are n items, there are _____ possible combinations of the items.

- ★ 2
- ★ n
- ★ **2^n (Page No. 92)**
- ★ 3^n

Question No: 121 (Marks: 1) - Please choose one
Fixed-length codes are known for easy break up of a string into its individual characters.

- ★ **True (Page No. 99)**
- ★ False

Question No: 122 (Marks: 1) - Please choose one
In _____ Knapsack Problem, limitation is that an item can either be put in the bag or not-fractional items are not allowed.

- ★ 0
- ★ 1
- ★ **0/1 (Page No. 91)**

★ Fractional

Question No: 123 (Marks: 1) - Please choose one
Those problems in which Greedy finds good, but not always best is called a greedy_____.

★ Algorithm
★ Solution
★ **Heuristic (Page No. 97)**
★ Result

Question No: 124 (Marks: 1) - Please choose one
In brute force based solution of knapsack problem, we consider 2 cases, Leave object Or Take object.

★ TRUE
★ **FALSE (Page No. 97)**

Question No: 125 (Marks: 1) - Please choose one
What is the solution to the recurrence T(n) = T(n/2)+n, T(1) = 1

★ O(logn)
★ **O(n) (Page No. 37)**
★ O(nlogn)
★ O(2n)

Question No: 126 (Marks: 1) - Please choose one
The knapsack problem does not belong to the domain of optimization problems.

★ True
★ **False (Page No. 91)**

Question # 127 (Marks: 1) Please choose one
Counting Money problem is an example which cannot be optimally solved by greedy algorithm.

★ **True (Page No. 97)**
★ False

Question # 128 (Marks: 1) Please choose one
Huffman algorithm generates an optimum prefix code.

★ **True (Page No. 102)**
★ False

Question # 129 (Marks: 1) Please choose one
If the string “lmncde” is coded with ASCII code, the message length would be _____ bits.

★ 24
★ 36
★ **48 (6*8=48)**
★ 60

Question # 130 (Marks: 1) Please choose one
There are _____ nested loops in DP based algorithm for computing the minimum cost of chain matrix multiplication.

★ 2
★ **3 (Page No. 90)**
★ 4
★ 5

Question # 131 (Marks: 1) Please choose one
Inductive approach to compute entries of V is implied in _____ based solution of knapsack problem.

★ Brute force
★ **Dynamic programming (Page No. 93)**

Question # 132 (Marks: 1) Please choose one
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|)
★ O(|V |^2|E|)
★ **O(|V | + |E|) (Page No. 116)**

Question # 133 (Marks: 1) Please choose one
Which is true statement?

★ **Breadth first search is shortest path algorithm that works on un-weighted graphs (Page No. 153)**
★ Depth first search is shortest path algorithm that works on un-weighted graphs.
★ Both of above are true.
★ None of above are true.

Question # 134 (Marks: 1) Please choose one
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

Question # 135 (Marks: 1) Please choose one
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. (Page No. 135)**
- ★ 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 # 136 (Marks: 1) Please choose one
In in-place sorting algorithm is one that uses arrays for storage :

- ★ An additional array
- ★ **No additional array (Page No. 54)**
- ★ Both of above may be true according to algorithm
- ★ More than 3 arrays of one dimension.

Question # 137 (Marks: 1) Please choose one
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. (Page No. 54)**

Question # 138 (Marks: 1) Please choose one
Which sorting algorithm is faster :

- ★ O(n^2)
- ★ **O(nlogn) (Page No. 46)**
- ★ O(n+k)
- ★ O(n^3)

Question # 139 (Marks: 1) Please choose one
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 sub arrays
- ★ **None of above. (Page No. 51)**

Question # 140 (Marks: 1) Please choose one
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 (Page No. 154)**
- ★ Has both greedy and dynamic approach to compute single source shortest paths to all other vertices.

Question # 141 (Marks: 1) Please choose one
Which may be stable sort:

- ★ Bubble sort
- ★ Insertion sort
- ★ **Both of above (Page No. 54)**
- ★ Selection sort

Question # 142 (Marks: 1) Please choose one
In the analysis of Selection algorithm, we eliminate a constant fraction of the array with each phase; we get the convergent _____ series in the analysis,

- ★ linear
- ★ arithmetic
- ★ **geometric (Page No. 37)**
- ★ exponent

Question # 143 (Marks: 1) Please choose one
How much time merge sort takes for an array of numbers?

- ★ T(n^2)
- ★ **T(n) (Page No. 40)**
- ★ T(log n)
- ★ T(n log n)

Question # 144 (Marks: 1) Please choose one
Counting sort has time complexity:

- ★ **O(n) (Page No. No. 58)**
- ★ O(n+k)

★ O(k)
★ O(nlogn)

Question # 145 (Marks: 1) Please choose one

The analysis of Selection algorithm shows the total running time is indeed _____in n,

★ arithmetic
★ geometric
★ **linear (Page No. 37)**
★ orthogonal

Question # 146 (Marks: 1) Please choose one
Sorting is one of the few problems where provable _____ bonds exits on how fast we can sort,

★ upper
★ **lower (Page No. 39)**
★ average
★ log n

Question # 147 (Marks: 1) Please choose one
In the analysis of Selection algorithm, we make a number of passes, in fact it could be as many as,

★ T(n)
★ T(n / 2)
★ **log n (Page No. 37)**
★ n / 2 + n / 4

Question # 148 (Marks: 1) Please choose one
The number of nodes in a complete binary tree of height h is

★ **2^(h+1) – 1 (Page No. 40)**
★ 2 * (h+1) – 1
★ 2 * (h+1)
★ ((h+1) ^ 2) – 1

Question # 149 (Marks: 1) Please choose one
How many elements do we eliminate in each time for the Analysis of Selection algorithm?

★ **n / 2 elements (Page No. 37)**
★ (n / 2) + n elements
★ n / 4 elements
★ 2 n elements

Question # 150 (Marks: 1) Please choose one
Slow sorting algorithms run in,

- ★ **T(n^2) (Page No. 39)**
- ★ T(n)
- ★ T(log n)
- ★ T(n log n)

Question # 151 (Marks: 1) Please choose one
An application problem is one in which you want to find, not just a solution, but the ____ solution.

- ★ Simple
- ★ **Good (Page No. 113) not sure**
- ★ Best
- ★ Worst

Question # 152 (Marks: 1) Please choose one
Counting sort is suitable to sort the elements in range 1 to k:

- ★ K is large
- ★ **K is small (Page No. 57)**
- ★ K may be large or small
- ★ None

Question # 153 (Marks: 1) Please choose one
Heaps can be stored in arrays without using any pointers; this is due to the _____ nature of the binary tree,

- ★ **left-complete (Page No. 40)**
- ★ right-complete
- ★ tree nodes
- ★ tree leaves

Question # 154 (Marks: 1) Please choose one
Sieve Technique can be applied to selection problem?

- ★ **True (Page No. 35)**
- ★ False

Question # 155 (Marks: 1) Please choose one
A heap is a left-complete binary tree that conforms to the _____

- ★ increasing order only
- ★ decreasing order only

★ **heap order (Page No. 40)**
★ (log n) order

Question # 156 (Marks: 1) Please choose one
Divide-and-conquer as breaking the problem into a small number of

★ pivot
★ Sieve
★ **smaller sub problems (Page No. 34)**
★ Selection

Question # 157 (Marks: 1) Please choose one
In Sieve Technique we do not know which item is of interest

★ **True (Page No. 34)**
★ False

Question # 158 (Marks: 1) Please choose one
For the heap sort, access to nodes involves simple _____ operations.

★ **arithmetic (Page No. 41)**
★ binary
★ algebraic
★ logarithmic

Question # 159 (Marks: 1) Please choose one
For the sieve technique we solve the problem,

★ **recursively (Page No. 34)**
★ mathematically
★ precisely
★ accurately

Question # 160 (Marks: 1) Please choose one
The sieve technique works in _____ as follows

★ **phases (Page No. 34)**
★ numbers
★ integers
★ routines

Question # 161 (Marks: 1) Please choose one

A (an) _____ is a left-complete binary tree that conforms to the heap order

- ★ **heap (Page No. 40)**
- ★ binary tree
- ★ binary search tree
- ★ array

Question # 162 (Marks: 1) Please choose one

The sieve technique is a special case, where the number of sub problems is just

- ★ 5
- ★ many
- ★ **0 (Page No. 34)**
- ★ few

Question # 163 (Marks: 1) Please choose one

Analysis of Selection algorithm ends up with,

- ★ T(n)
- ★ T(1 / 1 + n)
- ★ T(n / 2)
- ★ **T((n / 2) + n) (Page No. 37)**

Question # 164 (Marks: 1) Please choose one

For the heap sort we store the tree nodes in

- ★ **level-order traversal (Page No. 40)**
- ★ in-order traversal
- ★ pre-order traversal
- ★ post-order traversal

Question # 165 (Marks: 1) Please choose one

The reason for introducing Sieve Technique algorithm is that it illustrates a very important special case of,

- ★ **divide-and-conquer (Page No. 34)**
- ★ decrease and conquer
- ★ greedy nature
- ★ 2-dimension Maxima

Question # 166 (Marks: 1) Please choose one

Theta asymptotic notation for T (n) :

- ★ Set of functions described by: c1g(n)Set of functions described by c1g(n)>=f(n) for c1 s

- ★ Theta for T(n)is actually upper and worst case comp
- ★ Set of functions described by:
- ★ c1g(n)

Question # 167 (Marks: 1) Please choose one
Sieve Technique applies to problems where we are interested in finding a single item from a larger set of _____

- ★ **n items (Page No. 34)**
- ★ phases
- ★ pointers
- ★ constant

Question # 168 (Marks: 1) Please choose one
Memorization is?

- ★ To store previous results for future use
- ★ To avoid this unnecessary repetitions by writing down the results of recursive calls and looking them
- ★ **up again if we need them later (Page No. 47)**
- ★ To make the process accurate
- ★ None of the above

Question # 169 (Marks: 1) Please choose one
Quick sort is

- ★ Stable & in place
- ★ **Not stable but in place (Page No. 57)**
- ★ Stable but not in place
- ★ Some time stable & some times in place

Question # 170 (Marks: 1) Please choose one
One example of in place but not stable algorithm is

- ★ Merger Sort
- ★ **Quick Sort (Page No. 54)**
- ★ Continuation Sort
- ★ Bubble Sort

Question # 171 (Marks: 1) Please choose one
Continuation sort is suitable to sort the elements in range 1 to k

- ★ K is Large

- ★ K is not known
- ★ K may be small or large
- ★ **K is small (Page No. 57)**

Question # 172 (Marks: 1) Please choose one
Which may be a stable sort?

- ★ Merger
- ★ Insertion
- ★ **Both above (Page No. 54)**
- ★ None of the above

Question # 173 (Marks: 1) Please choose one
An in place sorting algorithm is one that uses ___ arrays for storage

- ★ Two dimensional arrays
- ★ More than one array
- ★ **No Additional Array (Page No. 54)**
- ★ None of the above

Question # 174 (Marks: 1) Please choose one
single item from a larger set of _____

- ★ **n items (Page No. 34)**
- ★ phases
- ★ pointers
- ★ vconstant

Question # 175 (Marks: 1) Please choose one
For the Sieve Technique we take time

- ★ **T(nk) (Page No. 34)**
- ★ T(n / 3)
- ★ n^2
- ★ n/3

Question # 176 (Marks: 1) Please choose one
One Example of in place but not stable sort is

- ★ **Quick (Page No. 54)**
- ★ Heap
- ★ Merge

★ Bubble

Question No: 177 (Marks: 1) - Please choose one
Due to left complete nature of binary tree, the heap can be stored in

★ **Arrays (Page No. 40)**
★ Structures
★ Link Lis
★ Stack

Question No: 178 (Marks: 1) - Please choose one
What type of instructions Random Access Machine (RAM) can execute?

★ Algebraic and logic
★ Geometric and arithmetic
★ **Arithmetic and logic (Page No. 10)**
★ Parallel and recursive

Question No: 179 (Marks: 1) - Please choose one
What is the total time to heapify?

★ **O(log n) (Page No. 43)**
★ O(n log n)
★ O(n2 log n)
★ O(log2 n)

Question No: 180 (Marks: 1) - Please choose one
Is it possible to sort without making comparisons?

★ **Yes (Page No. 57)**
★ No

Question No: 181 (Marks: 1) - Please choose one
When we call heapify then at each level the comparison performed takes time

★ **It will take Θ (1) (Page No. 43)**
★ Time will vary according to the nature of input data
★ It can not be predicted
★ It will take Θ (log n)

Question No: 182 (Marks: 1) - Please choose one
In Quick sort, we don't have the control over the sizes of recursive calls

★ **True (Page No. 40)**
★ False
★ Less information to decide
★ Either true or false

Question No: 183 (Marks: 1) - Please choose one
For Chain Matrix Multiplication we can not use divide and conquer approach because,

★ **We do not know the optimum k (Page No. 86)**
★ We use divide and conquer for sorting only
★ We can easily perform it in linear time
★ Size of data is not given

Question No: 184 (Marks: 1) - Please choose one
The Knapsack problem belongs to the domain of _____ problems.

★ **Optimization (Page No. 91)**
★ NP Complete
★ Linear Solution
★ Sorting

Question No: 185 (Marks: 1) - Please choose one
Mergesort is a stable algorithm but not an in-place algorithm.

★ **True (Page No. 54)**
★ false

Question No: 186 (Marks: 1) - Please choose one
Counting sort the numbers to be sorted are in the range 1 to k where k is small.

★ **True (Page No. 57)**
★ False

Question No: 187 (Marks: 1) - Please choose one
In selection algorithm, because we eliminate a constant fraction of the array with each phase, we get the

★ **Convergent geometric series (Page No. 37)**
★ Divergent geometric series
★ None of these

Question No: 188 (Marks: 1) - Please choose one
In RAM model instructions are executed

★ **One after another (Page No. 10)**
★ Parallel
★ Concurrent
★ Random

Question No: 190 (Marks: 1) - Please choose one
If the indices passed to merge sort algorithm are not equal, the algorithm may return immediately.

★ True
★ **False (Page No. 28)**

Question No: 191 (Marks: 1) - Please choose one
Brute-force algorithm uses no intelligence in pruning out decisions.

★ **True (Page No. 18)**
★ False

Question No: 192 (Marks: 1) - Please choose one
In analysis, the Upper Bound means the function grows asymptotically no faster than its largest term.

★ **True (Page No. 24)**
★ False

Question No: 193 (Marks: 1) - Please choose one
For small values of n, any algorithm is fast enough. Running time does become an issue when n gets large.

★ **True (Page No. 14)**
★ Fast

Question No: 194 (Marks: 1) - Please choose one
The ancient Roman politicians understood an important principle of good algorithm design that is plan-sweep algorithm.

★ True
★ **False (Page No. 27) [Divide and Conquer]**

Question No: 195 (Marks: 1) - Please choose one
In 2d-space a point is said to be _____if it is not dominated by any other point in that space.

★ Member
★ Minimal
★ **Maximal (Page No. 11)**
★ Joint

Question No: 196 (Marks: 1) - Please choose one
An algorithm is a mathematical entity that is dependent on a specific programming language.

★ True
★ **False (Page No. 7)**

Question No: 197 (Marks: 1) - Please choose one
The running time of an algorithm would not depend upon the optimization by the compiler but that of an implementation of the algorithm would depend on it.

★ **True (Page No. 13)**
★ False

Question No: 198 (Marks: 1) - Please choose one
F (n) and g (n) are asymptotically equivalent. This means that they have essentially the same _____ for large n.

★ Results
★ Variables
★ Size
★ **Growth rates (Page No. 23)**

Question No: 199 (Marks: 1) - Please choose one
8n2 + 2n - 3 will eventually exceed c2*(n) no matter how large we make c2.

★ **True (Page No. 25)**
★ False

Question No: 200 (Marks: 1) - Please choose one
If we associate (x, y) integers pair to cars where x is the speed of the car and y is the negation of the price. High y value for a car means a _____ car.

★ Fast
★ Slow
★ Expensive
★ **Cheap (Page No. 11)**

Question No: 201 (Marks: 1) - Please choose one
The function f(n)= n(logn+1)/2 is asymptotically equivalent to n log n. Here Upper Bound means the function f(n) grows asymptotically _____ faster than n log n.

★ More
★ Quiet

★ **Not (Page No. 24)**
★ At least

Question No: 202 (Marks: 1) - Please choose one
After sorting in merge sort algorithm, merging process is invoked.

★ **True (Page No. 28)**
★ False

Question No: 203 (Marks: 1) - Please choose one
Asymptotic growth rate of the function is taken over_____ case running time.

★ Best
★ Average
★ **Worst (Page No. 14)**
★ Normal

Question No: 204 (Marks: 1) - Please choose one
In analysis of f (n) =n (n/5) +n-10 log n, f (n) is asymptotically equivalent to _____.

★ n
★ 2n
★ n+1
★ **n2 (Page No. 23)**

Question No: 205 (Marks: 1) - Please choose one
Algorithm is concerned with.....issues.

★ Macro
★ Micro
★ **Both Macro & Micro (Page No. 8)**
★ Normal

Question No: 206 (Marks: 1) - Please choose one
We cannot make any significant improvement in the running time which is better than that of brute-force algorithm.

★ True
★ False (Page No. 18)

Question No: 207 (Marks: 1) - Please choose one

In addition to passing in the array itself to Merge Sort algorithm, we will pass in _____other arguments which are indices.

- ★ **Two (Page No. 28)**
- ★ Three
- ★ Four
- ★ Five

Question No: 208 (Marks: 1) - Please choose one
In analysis, the Lower Bound means the function grows asymptotically at least as fast as its largest term.

- ★ **True (Page No. 24)**
- ★ False

Question No: 209 (Marks: 1) - Please choose one
Efficient algorithm requires less computational…….

- ★ Memory
- ★ Running Time
- ★ **Memory and Running Time (Page No. 9)**
- ★ Energy

Question No: 210 (Marks: 1) - Please choose one
The O-notation is used to state only the asymptotic _____bounds.

- ★ Two
- ★ Lower
- ★ **Upper (Page No. 25)**
- ★ Both lower & upper

Question No: 211 (Marks: 1) - Please choose one
For the worst-case running time analysis, the nested loop structure containing one “for” and one “while” loop, might be expressed as a pair of _____nested summations.

- ★ 1
- ★ **2 (Page No. 16)**
- ★ 3
- ★ 4

Question No: 212 (Marks: 1) - Please choose one
Before sweeping a vertical line in plane sweep approach, in start sorting of the points is done in increasing order of their _____coordinates.

- ★ **X (Page No. 18)**
- ★ Y
- ★ Z
- ★ X & Y

Question No: 213 (Marks: 1) - Please choose one
Brute-force algorithm for 2D-Maxima is operated by comparing _____ pairs of points.

- ★ Two
- ★ Some
- ★ Most
- ★ **All (Page No. 18)**

Question No: 214 (Marks: 1) - Please choose one
The function f(n)=n(logn+1)/2 is asymptotically equivalent to nlog n. Here Lower Bound means function f(n) grows asymptotically at _____ as fast as nlog n.

- ★ Normal
- ★ **Least (Page No. 23)**
- ★ Most
- ★ All

Question No: 215 (Marks: 1) - Please choose one
In plane sweep approach, a vertical line is swept across the 2d-plane and _____structure is used for holding the maximal points lying to the left of the sweep line.

- ★ Array
- ★ Queue
- ★ **Stack (Page No. 18)**
- ★ Tree

Question No: 216 (Marks: 1) - Please choose one
Algorithm analysts know for sure about efficient solutions for NP-complete problems.

- ★ True
- ★ **False (Page No. 9)**

Question No: 217 (Marks: 1) - Please choose one
The sieve technique works where we have to find _____ item(s) from a large input.

- ★ **Single (Page No. 34)**
- ★ Two

★ Three
★ Similar

Question No: 218 (Marks: 1) - Please choose one
In which order we can sort?

★ increasing order only
★ decreasing order only
★ **increasing order or decreasing order (Page No. 39)**
★ both at the same time

Question No: 219 (Marks: 1) - Please choose one
Memoization is?

★ To store previous results for future use
★ **To avoid this unnecessary repetitions by writing down the results of recursive calls and looking them up again if we need them later (Page No. 74)**
★ To make the process accurate
★ None of the above

Question No: 220 (Marks: 1) - Please choose one
In place stable sorting algorithm.

★ **If duplicate elements remain in the same relative position after sorting (Page No. 54)**
★ One array is used
★ More than one arrays are required
★ Duplicating elements not handled

Question No: 221 (Marks: 1) - Please choose one
The running time of quick sort depends heavily on the selection of

★ No of inputs
★ Arrangement of elements in array
★ Size o elements
★ **Pivot elements (Page No. 49)**

Question No: 222 (Marks: 1) - Please choose one
A point p in 2-dimensional space is usually given by its integer coordinate(s)_____

★ p.x only
★ p.y only
★ p.x & p.z

★ **p.x & p.y (Page No. 10)**

Question No: 223 (Marks: 1) - Please choose one
In _____ we have to find rank of an element from given input.

★ Merge sort algorithm
★ **Selection problem (Page No. 34)**
★ Brute force technique
★ Plane Sweep algorithm

Question No: 224 (Marks: 1) - Please choose one
A RAM is an idealized algorithm with takes an infinitely large random-access memory.

★ True
★ **False (Page No. 10)**

Question No: 225 (Marks: 1) - Please choose one
_____ is one of the few problems, where provable lower bounds exist on how fast we can sort.

★ Searching
★ **Sorting (Page No.)**
★ Both Searching & Sorting
★ Graphing

Question No: 226 (Marks: 1) - Please choose one
Floor and ceiling are _____ to calculate while analyzing algorithms.

★ Very easy
★ **Usually considered difficult (Page No. 31)**

Question No: 227 (Marks: 1) - Please choose one
In Heap Sort algorithm, the maximum levels an element can move upward is _____

★ **Theta (log n) (Page No. 43)**
★ Order (log n)
★ Omega (log n)
★ O (1) i.e. Constant time

Question No: 228 (Marks: 1) - Please choose one
In Heap Sort algorithm, the total running time for Heapify procedure is _____

★ **Theta (log n) (Page No. 43)**
★ Order (log n)

★ Omega (log n)
★ O (1) i.e. Constant time

Question No: 229 (Marks: 1) - Please choose one
Algorithm is a mathematical entity, which is independent of a specific machine and operating system.

★ True
★ **False (Page No. 7)**

Question No: 230 (Marks: 1) - Please choose one
While Sorting, the ordered domain means for any two input elements x and y _____ satisfies only.

★ x < y
★ x > y
★ x = y
★ **All of the above (Page No. 39)**

Question No: 231 (Marks: 1) - Please choose one
Quick sort is best from the perspective of Locality of reference.

★ **True (Page No. 9)**
★ False

Question No: 232 (Marks: 1) - Please choose one
In Heap Sort algorithm, we build _____ for ascending sort.

★ **Max heap (Page No. 41)**
★ Min heap

Question No: 233 (Marks: 1) - Please choose one
In Sieve Technique, we know the item of interest.

★ True
★ **False (Page No. 34)**

Question No: 234 (Marks: 1) - Please choose one
While solving Selection problem, in Sieve technique we partition input data _____

★ In increasing order
★ In decreasing order
★ **According to Pivot (Page No. 35)**
★ Randomly

Question No: 235 (Marks: 1) - Please choose one
In pseudo code, the level of details depends on intended audience of the algorithm.

- ★ **True (Page No. 12)**
- ★ False

Question No: 236 (Marks: 1) - Please choose one
If the indices passed to merge sort algorithm are _____,then this means that there is only one element to sort.

- ★ Small
- ★ Large
- ★ **Equal (Page No. 28)**
- ★ Not Equal

Question No: 237 (Marks: 1) - Please choose one
Can an adjacency matrix for a directed graph ever not be square in shape?

- ★ Yes
- ★ **No**

Question # 238 (Marks: 1) Please choose one
In Quick sort algorithm, constants hidden in T(n lg n) are

- ★ Large
- ★ Medium
- ★ Not known
- ★ **Small**

Question # 239 (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 # 240 (Marks: 1) Please choose one
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.

Question No: 241 (Marks: 1) - Please choose one
Consider the following Huffman Tree The binary code for the string TEA is

- ★ **10 00 010**
- ★ 011 00 010
- ★ 10 00 110
- ★ 11 10 110

Question No: 242 (Marks: 1) - Please choose one
Who invented Quick sort procedure?

- ★ **Hoare**
- ★ Sedgewick
- ★ Mellroy
- ★ Coreman

Question No: 243 (Marks: 1) - Please choose one
The Huffman algorithm finds a polynomial solution

- ★ True
- ★ False

Question No: 244 (Marks: 1) - Please choose one
The Huffman algorithm finds an exponential solution

- ★ True
- ★ False

Question No: 245 (Marks: 1) - Please choose one
The Huffman algorithm finds a (n) _____ solution.

- ★ **Optimal**
- ★ Non-optimal
- ★ Exponential
- ★ Polynomial

Question No: 246 (Marks: 1) - Please choose one
Maximum number of vertices in a Directed Graph may be |V2|

- ★ True
- ★ **False**

Question No: 246 (Marks: 1) - Please choose one

If a graph has v vertices and e edges then to obtain a spanning tree we have to delete

- ★ v edges.
- ★ v – e + 5 edges
- ★ v + e edges.
- ★ None of these

Question No: 247 (Marks: 1) - Please choose one

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)**

Question No: 248 (Marks: 1) - Please choose one

Although it requires more complicated data structures, Prim's algorithm for a minimum spanning tree is better than Kruskal's when the graph has a large number of vertices.

- ★ **True**
- ★ **False**

Question # 249 (Marks: 1) Please choose one

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

Question # 250 (Marks: 1) Please choose one

The recurrence relation of Tower of Hanoi is given below T(n)={1 if n=1 and 2T(n-1) if n >1 In order to move a tower of 5 rings from one peg to another, how many ring moves are required?

- ★ 16
- ★ 10
- ★ 32
- ★ **31**

Question # 251 (Marks: 1) Please choose one

Continuing sort has time complexity of ?

- ★ **O(n)**
- ★ O(n+k)
- ★ O(nlogn)
- ★ O(k)

Question No: 252 (Marks: 1) - Please choose one
If there are Θ (n2) entries in edit distance matrix then the total running time is

- ★ Θ (1)
- ★ **Θ (n2)**
- ★ Θ (n)
- ★ Θ (n log n)

Question No: 253 (Marks: 1) - Please choose one
In Quick Sort Constants hidden in T(n log n) are

- ★ Large
- ★ Medium
- ★ **Small**
- ★ Not Known

Question No: 254 (Marks: 1) - Please choose one
Merge sort makes two recursive calls. Which statement is true after these recursive calls finish, but before the merge step?

- ★ The array elements form a heap
- ★ **Elements in each half of the array are sorted amongst themselves**
- ★ Elements in the first half of the array are less than or equal to elements in the second half of the array
- ★ None of the above

Question No: 255 (Marks: 1) - Please choose one
In Heap Sort algorithm, if heap property is violated _____

- ★ We call Build heap procedure
- ★ We call Heapify procedure
- ★ We ignore
- ★ Heap property can never be violated

Question # 256 (Marks: 1) Please choose one
Consider the following Algorithm:
Factorial (n){

```
if (n=1)
  return 1
else
   return (n * Factorial(n-1))
}
```


Recurrence for the following algorithm is:

- ★ T(n) = T(n-1) +1
- ★ T(n) = nT(n-1) +1
- ★ T(n)= T(n-1) +n
- ★ T(n)=T(n(n-1)) +1

Question No: 257 (Marks: 1) - Please choose one

Consider the following code:

```
For(j=1; j<n;j++)
  For(k=1; k<15;k++)
    For(l=5; l<n; l++)
    {
      Do_something_constant();
    }
```

What is the order of execution for this code.

- ★ **O(n)**
- ★ O(n3)
- ★ O(n2 log n)
- ★ O(n2)