

TELANGANA UNIVERSITY
S.S.R. DEGREE COLLEGE, NIZAMABAD (C.C:5029)
III SEMESTER INTERNAL ASSESSMENT II EXAMINATIONS
COMPUTER SCIENCE (DATA STRUCTURES USING C++) QUESTION BANK

I. Multiple choice questions

1. The operations of processing each element in the list is known as [d]
(a) Sorting (b) Merging (c) Inserting (d) Traversal
2. The other name for directed graph is _____ [b]
(a) Directed Graph (b) Digraph (c) Dirgraph (d) Dia-Graph
3. Binary trees with thread are called as _____ [a]
(a) Threaded Tree (b) Pointer Tree (c) Special Tree (d) Special Pointer Tree
4. A terminal node in a binary tree is called _____ [b]
(a) Root (b) Leaf (c) Inserting (d) Branch
5. Which indicated Pre-Order Traversal [c]
(a) Left SubTree, Right SubTree, Root (b) Right SubTree, Left SubTree, Root
(c) Root, Left SubTree Right SubTree (d) Right SubTree, Root, Left SubTree
6. Linked Representation of binary tree need _____ Practical Arrays [c]
(a) 4 (b) 2 (c) 3 (d) 5
7. Graphs are represented using [b]
(a) Adjacency Tree (b) Adjacency Linked List/ Matrix
(c) AdjacencyGraph (d) Adjacency Queue
8. The spanning tree of connected graph with 10 vertices contain _____ [a]
(a) 9 He is nervous (b) 11 Edeges (c) 10 Edeges (d) 9 Vertices
9. In Binary tree nodes with no successor are called [b]
(a) End Nodes (b) Terminal Nodes (c) Final Nodes (d) Last Nodes
10. Which of the following tree traversal visit root node last [a]
(a) Post Order (b) In-Order (c) none (d) Pre-Order
11. Which of the following algorithm design technique is used in the Quick Sort Algorithm? [c]
(a) Dynamic Programming (b) Back tracking (c) Divide and Conquere (d) Greedy Method
12. Merge Sort uses [a]
(a) Dynamic Programming (b) Back tracking (c) Heuristic Approach (d) Greedy Method
13. The Complexity of Bubble sort in best case is [a]
(a) $\theta(n)$ (b) $\theta(n \log n)$ (c) $\theta(n^2)$ (d) $\theta(n(\log n)^2)$
14. Which of the following algorithm pays the least attention to the ordering of the elements in the input? [b]
(a) Insert Sort (b) Selection Sort (c) Quick Sort (d) None
15. Which of the following is not a stable Algorithm [b]
(a) Insertion Sort (b) Selection Sort (c) Bubble Sort (d) Merge Sort
16. Finding the location of the elements with a given values is [b]
(a) Traversal (b) Searching (c) Sorting (d) None
17. Which of the following is not a non-comparison sort [d]
(a) Counting Sort (b) Bucket Sort (c) Radix Sort (d) Shell Sort
18. _____ is putting an element in the appropriate place in a sorted list. [a]
(a) Insertion Sort (b) Extraction Sort (c) Selection Sort (d) Merge Sort
19. Partition and Exchange sorting is _____ [a]
(a) Quick Sort (b) Tree Sort (c) Heap Sort (d) Bubble Sort
20. Which of the following sorting algorithm of priority queue uses [a]
(a) Bubble Sort (b) Insertion Sort (c) Merge Sort (d) Selection Sort

II. Fill in the Blanks.

1. Tree is a nonlinear data structure which organizes data in hierarchical structure.
2. If we have N number of nodes then we have a maximum of N-1 number of links.
3. The connecting links between any two nodes in a tree is called Edge
4. A Binary tree can have maximum of 2 children.
5. A full binary tree is also known as proper binary tree or 2-Tree
6. Visiting order of node in a binary tree is called as binary tree traversal
- 7 Graph is nonlinear data structure which contains set of points known as Nodes and Links
8. A Graph with un directed edges is called undirected graphs
9. A graph is said to be regular graph if all its vertices have the same degree.
- 10 DFS and BFS traversal of a graph results spanning tree.
11. Searching is a process of locating a particular element in a set of Elements.
12. Sorting refers to ordering / Arranging data in a increasing or decreasing fashion.
13. Quick sort partitions a an array which are called as sub array
14. Merge sort technique is based on divide and conquire
15. Bubble sort algorithm is based on comparison
- 16.The complexity of Bubble Sort algorithm is $O(n^2)$
17. Heap data structure is a Binary tree
18. Max Heap is a fully binary tree
19. As per ADT heap is a data type which stores a collection of elements.
20. Heap Sort is one of the best sorting method with no worst case.

III. Short Questions.

1. Define a tree.

Ans: A tree' is a non-linear data structure represented in a hierarchical manner. It contains a finite set d elements called 'hode".

2. Define static tree table.

Ans: The static tree table is a structure in which operations like insertion and deletion are not allowed and symbols are already known.

3. Define binary tree.

Ans: A binary tree T is defined by finite set of elements called nodes such that,

(a) A binary tree is empty or (b) It consists of a node called 'root' which includes two binary trees called left subtree and right subtree of the root.

4. Define searching.

Ans: Searching is a process done to know the correct location of an element from a list or array d elements. In an array, elements are stored in consecutive memory locations. Searching is done by comparing a particular element with the remaining elements until the exact match is found.

5. Define a graph.

Ans: A graph is defined as $G = (V,E)$ where,

(i) V is the set of elements called nodes or vertices or points,

(ii) E is the set of edges of the graph identified with a unique pair (U, V) of nodes.

Here (U, V) pair denotes that there is an edge from node U to node V.

6. Define hashing.

Ans: Hashing is a technique that makes use of a hash function for mapping pairs to the corresponding (entries) positions in a hash table. Ideally a pair 'P' with a key 'K' is stored at a position $f(K)$ by the hash function. Each hash table position can store one pair.

7. Define hash function.

Ans: It is a function that is used to map the dictionary pairs to the corresponding entries in the hash table.

If the dictionary pair is 'pair' and if it consists of the key 'key and if f denotes the hash function then the pair "pair" is stored at $f(\text{key})$ position in a table.

In order to search a pair with the key K , first we find $f(K)$ and determine whether a pair is at $f(K)$ position in the hash table. If it is not present at $f(K)$ then we insert the pair at $f(K)$ else if it occurs $f(K)$ then we find the desired pair that can be deleted if required.

8. Define hash table.

Ans: It is a data structure that is used to store dictionary pairs. It is of fixed size. The 'search' operation is applied to a part of the dictionary pair called the key. The size of the hash table is represented by a variable called the table size which ranges from q to $(\text{table size} - 1)$.

9. Define heap.

Ans: A complete binary tree in which the value node is either greater than, lesser than or equal to values in child nodes is called a heap.

Heap can be classified as,

(i) Ascending heap (min heap)

(ii) Descending heap (max heap)