1. **What is data structure?**

A data structure is a way of organizing data that considers not only the items stored, but also their relationship to each other. Advance knowledge about the relationship between data items allows designing of efficient algorithms for the manipulation of data.

2. **List out the areas in which data structures are applied extensively?**

Compiler Design, Operating System, Database Management System, Statistical analysis package, Numerical Analysis, Graphics, Artificial Intelligence, Simulation

3. **What are the major data structures used in the following areas: RDBMS, Network data model & Hierarchical data model?**

- RDBMS—Array (i.e. Array of structures)
- Network data model—Graph
- Hierarchical data model—Trees

4. **If you are using C language to implement the heterogeneous linked list, what pointer type will you use?**

The heterogeneous linked list contains different data types in its nodes and we need a link, pointer to connect them. It is not possible to use ordinary pointers for this. So we go for void pointer. Void pointer is capable of storing pointer to any type as it is a generic pointer type.

5. **Minimum number of queues needed to implement the priority queue?**

Two. One queue is used for actual storing of data and another for storing priorities

6. **What are the notations used in Evaluation of Arithmetic Expressions using prefix and postfix forms?**

Polish and Reverse Polish notations.

7. **Convert the expression \(((A + B) \times C) - (D - E)^{(F + G)}\) to equivalent Prefix and Postfix notations.**

Prefix Notation: \(^^\wedge \wedge - * + ABC - DE + FG\)
Postfix Notation: \(AB + C * DE - - FG + ^\).

8. **What are the methods available in storing sequential files?**

1. Straight merging
2. Natural merging
3. Polyphase sort
4. Distribution of Initial runs.

9. **How many different trees are possible with 10 nodes?**

1014 If there are n nodes, there exist 2n-n different trees.

10. **List out few of the Application of tree data-structure?**

1. The manipulation of Arithmetic expression,
2. Symbol Table construction,
3. Syntax analysis.
11. List out few of the applications that make use of Multilinked Structures?

Sparse, 
Index generation.

12. In tree construction, which is the suitable efficient data structure?

Linked list.

13. What is the type of the algorithm used in solving the 8 Queens problem?

Backtracking.

14. In an AVL tree, at what condition the balancing is to be done?

If the ‘pivotal value’ (or the ‘Height factor’) is greater than 1 or less than –1.

15. What is the bucket size, when the overlapping and collision occur at same time?

One. If there is only one entry possible in the bucket, when the collision occurs, there is no way to accommodate the colliding value. This results in the overlapping of values.

16. What is a spanning Tree?

A spanning tree is a tree associated with a network. All the nodes of the graph appear on the tree once. A minimum spanning tree is a spanning tree organized so that the total edge weight between nodes is minimized.

17. Does the minimum spanning tree of a graph give the shortest distance between any 2 specified nodes?

No. Minimal spanning tree assures that the total weight of the tree is kept at its minimum. But it doesn’t mean that the distance between any two nodes involved in the minimum-spanning tree is minimum.

18. which is the simplest file structure?

Sequential.

19. Whether Linked List is linear or Non-linear data structure?

According to Access strategies Linked list is a linear one. According to Storage Linked List is a Non-linear one.