1. Answer in detail. (Any TWO) [18]
   a) What do you mean by hashing? Name different hashing methods. Explain any giving suitable example.
   b) Explain AVL trees with proper example.
   c) Discuss the Backtracking Algorithm and explain any one in detail.

2. Do as directed: [20]
   I. Discuss in detail. (Any TWO) [18]
      a) Write the Huffman coding for the following sentence:
          There was cat in the house.
      b) Give an example of an application where Greedy algorithm can be used. Explain how the greedy algorithm will be used in this application.
      c) Write an algorithm that searches a value in a stored array using binary search. What is the time complexity of binary search?
   II. Explain acyclic and cyclic graphs. [02]

3. Do as directed. [18]
   a) Explain Critical Path Analysis taking suitable example. [08]
   -- OR --
   a) Explain Scatter table and chained scatter table in detail. [08]
b) Apply topological sort algorithm to the following graph and explain all the steps

```
  2
 /|
/ |
 3 -- 4
 |
|
5   6
|
|
7   8
|
|
9
```

[08]

c) Define leftist and binomial queues
[02]

4 Do as directed.

a) Explain garbage collection. Explain reference counting garbage collection.

-- OR --

a) What is an AVL tree? Explain how to construct an AVL tree taking proper example.

b) Explain breadth-first traversal giving suitable example.

c) Define complete binary tree

[06]

[06]

[06]

[02]