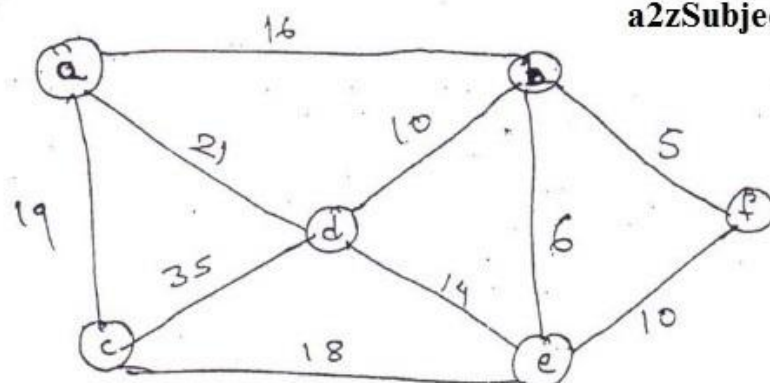


- N.B. : (1) Question No. 1 is compulsory.  
 (2) Answer **any three** out of remaining questions.  
 (3) Assume suitable data if necessary.  
 (3) **Figures to the right indicate full marks.**

- 1 (a) Explain with example 3
  - (i) Degree of tree
  - (ii) Height of tree
  - (iii) Depth of tree
- (b) What is linked list? Give its applications. 3
- (c) Define Graph. List the types Graph with example. 3
- (d) What is Asymptotic Notations. 3
- (e) Write down the properties of Red-Black tree. 3
- (f) What are linear and non-linear data structures. 3
- (g) Define minimum spanning tree. 2  
 List the techniques to compute minimum spanning tree.
- 2 (a) Write a program to implement Queue ADT using array 10
- (b) Define Binary search tree. Write an algorithm to implement Insertion and Deletion Operation. 10
3. (a) Write a program to convert INFIX expression into POST FIX expression. 10
- (b) Define AVL tree? Construct AVL tree for following data [ Mention type of rotation for each case ] 10  
 1, 2, 3, 4, 8, 7, 6, 5, 11, 10, 12
4. (a) Using Prim's and kruskal's algorithm find minimum spanning tree for the following Graph 10



[ TURN OVER ]

- (b) Write an algorithm to implement shell sort. 10
5. (a) Write a program to create singly linked list and display the list. 10  
(b) Explain BFS and DFS algorithm with example. 10
6. Write short note on any four 20
- (a) B- Tree
  - (b) Red Black Trees
  - (c) Searching Algorithms
  - (d) Sparse Matrix
  - (e) Euclids algorithm
  - (f) Merge Sort