

ET504M - Data Structure and Algorithm

P. Pages : 2

Time : Three Hours



GUG/W/24/13925

Max. Marks : 80

- Notes :
1. All questions carry equal marks.
 2. Illustrate your answers wherever necessary with the help of neat sketches.
 3. All questions are compulsory.

1. a) Define data structure. Explain its types with example. 8
- b) What is binary search. Write a program for binary search using recursion. 8

OR

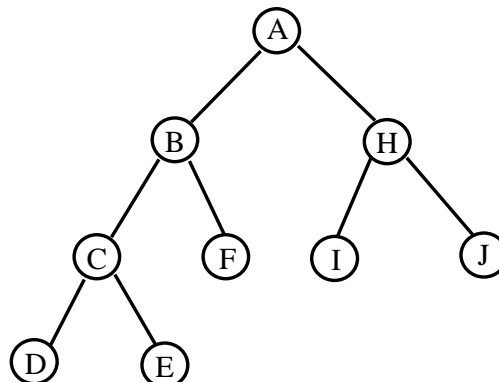
2. a) Explain analysis of an algorithm with the help of asymptotic notation. 8
- b) Find the best, average and worst of the array [1, 2, 3, 4, 5, 6, 7] to search the key = 7 and explain the process in detail. 8
3. a) Explain PUSH, POP and display function of stack in detail. 8
- b) Convert following infix to postfix expression. 8
- i) $A * B + C / D$ ii) $(A + B) * C / D + E \wedge F / G$
- iii) $(A + B \uparrow D) / (E - F + G)$ iv) $(A + B \wedge C) * D + E \wedge F$

OR

4. a) Explain application of stack with example. 8
- b) What is queue? Write a program to implement a circular queue. 8
5. a) Define linked list. Write a C-program for circular linked list. 8
- b) What is binary search tree? Write a program to create the Binary Search Tree (BST). 8

OR

6. a) Write preorder and postorder for the following tree with algorithm. 8



- b) Explain following terminologies. 8
- i) AVL tree
 - ii) B^+ tree

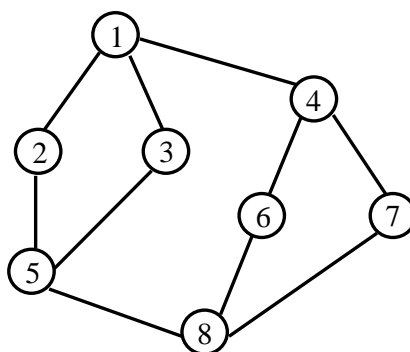
7. a) Write down the algorithm for quick sort. Also discuss the time complexity? 8
- b) What is hashing? Explain hashing technique with suitable example. 8

OR

8. a) Explain heap sort with algorithm and C-program. 8
- b) Write a C-program for merge sort. Also write down its complexity. 8
9. a) Define the term 8
- i) Graph
 - ii) Directed Graph
 - iii) Degree of Graph
 - iv) Complete Graph
- b) Explain BFS technique with example and algorithm. 8

OR

10. a) Illustrate DFS traversal for the following Graph. 8



- b) What is minimum spanning tree? Explain Prims algorithm with suitable example. 8
