

B.E. Electronics & Communication / Telecommunication Engineering (Model Curriculum) Sem-V
ET504M : Data Structure and Algorithm

P. Pages : 2

Time : Three Hours



GUG/W/22/13925

Max. Marks : 80

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

1. a) Define Data structure and explain its types by with example? **8**
- b) What is Binary search? Write a program to implement binary search. Also explain its worst and best case time complexity. **8**

OR

2. a) Explain Data Structure operation in details with suitable example? **8**
- b) Write a C program to insert a new element in array of size 20. Also display the array elements after insertion of new element. **8**
3. a) Write a menu driven program in C to implement the following functions of stack. **8**
- i) PUSH
 - ii) POP
 - iii) TRAVERSE
 - iv) EXIT
- b) Convert the following infix expression to postfix expression. **8**
- i) $(A + B) - C + D * (E / F \uparrow G)$
 - ii) $[(x + y) * z] \uparrow [(a - b) / c + e]$
 - iii) $(A + B) / [C - D * (F - Q)] + G$
 - iv) $(A \uparrow B \uparrow C) / (D \uparrow E * (G \uparrow F))$

OR

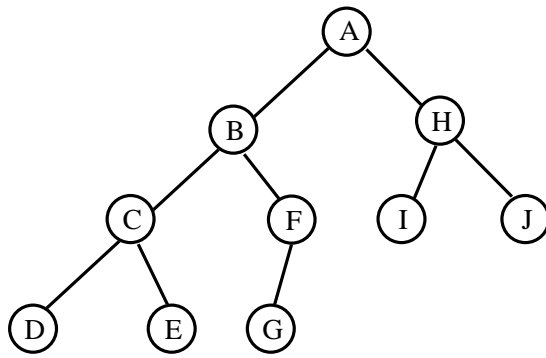
4. a) What is circular queue? Write application of queue. **8**
- b) Write a C program for insertion, deletion operation in a linear queue. **8**
5. a) What is node is linked list? Write a C code function for the following single linked list operations. **10**
- i) Inserting a node at given position
 - ii) Reverse a linked list items.
- b) Differentiate singly and doubly linked list? **6**

OR

6. a) Write short note on. **8**
- i) B⁺ Tree
 - ii) Threaded Binary Tree.

- b) Write preorder, inorder and postorder for the following tree.

6



- c) Explain following tree terminologies

2

- i) Degree.
- ii) Balance factor.

7. a) Explain selection sort with suitable example. Write a C function for selection sort.

8

- b) What is merge sort? Sort the following array using merge sort – 10, 9, 3, 4, 6, 2, 1, 12, 14

8

OR

8. a) What is Hash table? What is collision? Explain collision resolution techniques.

8

- b) Sort the following array using Bubble sort.

8

77, 33, 11, 44, 88, 22, 66, 55

Write the algorithm and give the time complexity of same.

9. a) Define the following terms,

8

- i) Graph.
- ii) Directed Graph.
- iii) Degree of Graph.
- iv) Complete Graph.

- b) Explain graph traversal techniques with example?

8

OR

10. a) Explain graph representation technique with same suitable graph.

8

- b) Illustrate DFS traversal for following graph.

8

