B.E. Electronics & Communication / Telecommunication Engineering (Model Curriculum)
Semester - V

ET504M - Data Structure and Algorithm

P. Pages : 2 **GUG/S/23/13925**

Time : Three Hours * 2 6 6 2 * Max. Marks : 80

Notes : 1. All questions are compulsory.
2. All questions carry equal marks.
3. Assume suitable data wherever necessary.

1. a) Explain analysis of algorithm with the help of asymptotic notation. **8**

b) What is algorithm? Explain characteristic of algorithm and time space trade – off. **8**

OR

2. a) Explain linear search with suitable example. **8**

b) Explain data structure operations in details. **8**

3. a) Write a menu driven program in C to implement the following fun^{n}s of stack. **8**

i) Push ( ) ii) Pop ( )

iii) traverse ( ) iv) exit ( )

b) What is queue? Explain types of queue. **8**

OR

4. a) Convert following infix to prefix expression. **8**

i) $((A+B-D)/(E-F)+G)$

ii) $(A+B\wedge C)*D+E\wedge 5$

iii) $(A+B\uparrow D)/(E-F+G)$

iv) $A+((B*C)-(D/(E\$F))*G)*H$

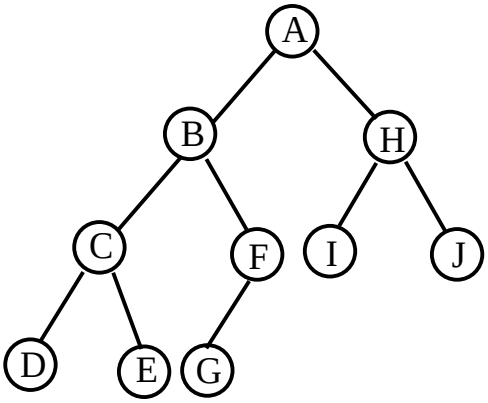
b) Write a C-Program for circular queue. **8**

5. a) Write a C-program for circular linked list. **8**

b) Write a C-program to count number of nodes in circular linked list. **8**

OR

6. a) Write inorder, preorder and postorder for the following tree. **6**



b) Explain following tree terminologies. **2**

i) Binary tree ii) Complete binary tree

c) Write a C-program for tree traversal method of binary search tree. **8**

7. a) Write down the algorithm for quick sort and simulate the sequence. **8**
43, 23, 75, 12, 67, 58, 93, 38, 99, 87, 71
Also discuss the time complexity?

b) What is hashing? Explain hashing techniques with suitable example. **8**

OR

8. a) Explain Heap sort with suitable example. **8**

b) Write a C-program for merge sort. Also write down its complexity. **8**

9. a) Describe following representation of graph. **8**

i) Adjacency matrix

ii) Adjacency list

iii) Multi list

iv) Path – matrix

b) Explain DFS and BFS technique with suitable example. **8**

OR

10. What is graph? Explain any eight basic graph terminologies with suitable example? **16**

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