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

ET504M / STRUCTURE1 - Data Structure and Algorithm

P. Pages : 3

Time : Three Hours

2335

Max. Marks : 80

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Notes : 1. All questions are compulsory.
2. All questions carry equal marks.
3. Due credit will be given to neatness and adequate dimensions.
4. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) For a certain problem, Mohit and Rohit wrote a solution in a frequency of **8**
$N^3 + 25$ and $2N^2 + 800$ respectively..
i) What are the Big-O requirements of each algorithm.
ii) Check both the solution for the value of N in the range from 3 to 10.
And conclude whose solution is better or not on O-notation basis.

b) State and explain various operations on data structures. **8**

OR

2. a) Write a C code to implement binary search algorithm. **8**

b) What is searching process and explain linear search with example. **8**

3. Convert the following infix into prefix and postfix expression using stack **16**
i) A*B+C/D ii) (A+B)*C/D+E^F/G

OR

4. a) Explain circular queue with neat sketch and write algorithm for following: **8**
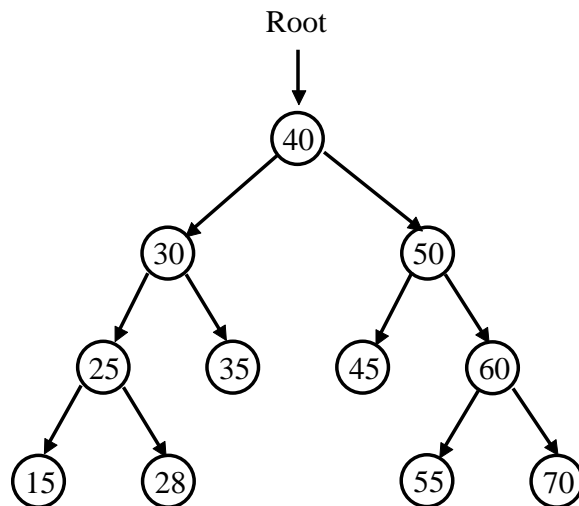i) insertion at beginning. ii) deletion at end.

b) Write a note on applications of stack. **8**

5. a) Consider the following elements {2,3,4,5,6,7,8). Show the above elements in circular **8**
linked list and perform the following operations:
i) insert element-10 at the beginning of the list.
ii) delete at the last element of the list.
iii) insert the element=11 at the beginning of the list.
Illustrate the representation of linked list at each stage with neat sketches and links and
state complexity at each operation.

b) Write algorithm for singly linked list: **8**
1) Insertion at the beginning
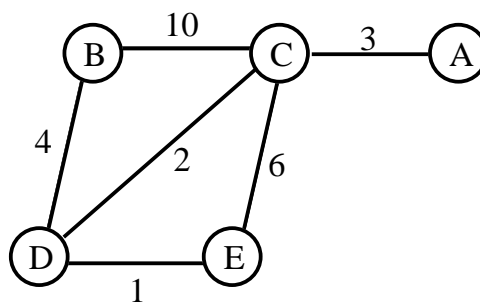2) Deletion at the beginning.
3) Insertion at the end.

OR

6. a) What is heighted balanced tree and write an algorithm for insertion a node in it. **8**

b) Find the pre order traversal and post order traversal of below tree. **8**

Root

7. a) Compare insertion and selection sort with an example. **8**

b) Perform heap sort on the given array: **8**
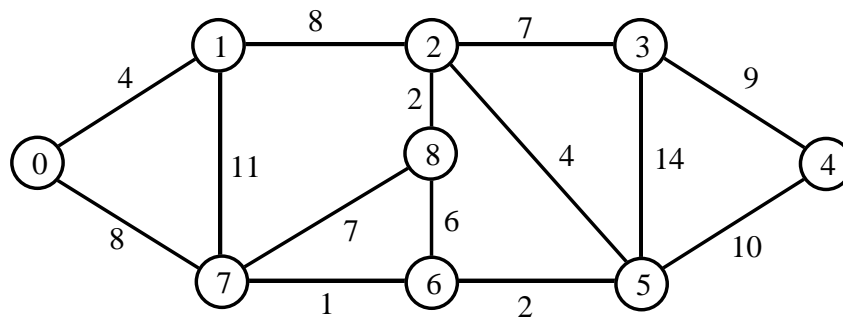A = {81, 89, 9, 11, 14, 76, 54, 22}.

OR

8. a) Write algorithm for bubble sort and explain it with an example. **8**

b) Sort the following array with quick sort with all iterations and state complexity. **8**
A = {45, 35, 15, 55, 75, 90, 40, 65, 99, 25, 88}.

9. a) Define the following. **8**
  i) Graph
  ii) Directed graph
  iii) Weighted graph
  iv) Outdegree and indegree of graph

b) Find the minimum spanning tree of the graph using prims algorithm and calculate the cost **8**
of minimum spanning tree.

OR

10. a) Find the minimum spanning tree for below graph using Krushkal algorithm. **8**

b) Explain BFS with example. **8**

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