VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (E.E.E) III Year I-Semester Supplementary Examinations, May/June-2017

Finishing School-III : Technical Skills

Time: 1 ½ hours

Max. Marks: 35

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (5 x 2 = 10 Marks)

1. List out any applications of linear and non linear data structures.

2. Write the applications of queue.

3. What are the advantages of representing stacks using linked list than arrays?

4. Define Binary Search Tree and construct a binary search tree for the following data
    45, 32, 70, 67, 21, 85, 92, 40

5. For the given graph, draw the DFS and BFS.

Part-B (5 × 5 = 25 Marks)

6. a) How the performance analysis of a program can be computed. [2]
    What will be the complexity of the following code?

```
while(i<N)
{
    while(j<M)
    {
        for(k=1;k<p;k++)
        {
            /*some code here*/
        }
    }
}
```

b) Define polynomial ADT. Write the pseudo code for polynomial addition operation. [3]

7. a) Convert the following infix expression into postfix using an algorithm: [2]
    ((A+B)*C-(D-E)^(F+G)) and explain the steps in detail

    b) Write the pseudo code for queue operations. [3]

8. a) Define sparse matrix. How to represent sparse matrix using linked list. [2]

    b) Explain the following operations in singly linked list. [3]
       i)   Insert new node at the middle of the list
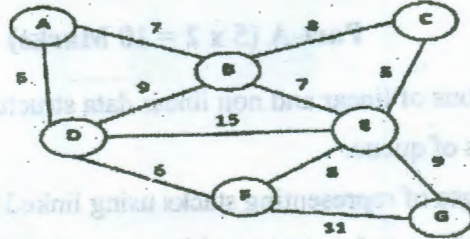   ii) Delete the last node and first node
       iii) Display

9. a) Define Red-Black tree. Write the properties of Red-Black tree [2]

b) Define B-tree. Draw a B-tree of order 3 for the following sequence of keys: [3]
2, 4, 9, 8, 7, 6, 3, 1, 5, 10

10. a) Find the minimum cost spanning tree for the following graph. [2]

b) Write an algorithm for the insertion sort. Construct sorting for the following numbers using insertion sort. [3]
142, 543, 123, 65, 453, 879, 572, 434

11. a) Define string ADT with one example. [2]

b) Distinguish queues with circular queue and explain the routines for insertion and deletion using circular queue. [3]

12. Write short notes on any *two* of the following: [5]
   a) Doubly linked list
   b) AVL trees.
   c) Heap sort

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