Code No: CT1503

GEC-R14

I B. Tech II Semester Regular/Suppl. Examinations, May 2016
DATA STRUCTURES
(Electronics and Communication Engineering and Information Technology)

**Time: 3 Hours**   **Max. Marks: 60**

Note: All Questions from **PART-A** are to be answered at one place.
Answer any **FOUR** questions from **PART-B**. All Questions carry equal Marks.

PART-A

6 × 2 = 12M

1. Define linked list. Draw a double linked list with header node.
2. Define the terms PUSH and POP used in stack.
3. Define the ADT of a circular queue.
4. Draw the expression tree for the given infix expression.

   A+B*C/D

5. Given a telephone directory and a name of the subscriber, which searching method you would suggest for finding the telephone number of the given subscriber.
6. Name two data structures used to represent a graph.

PART-B

4 × 12 = 48M

1. Refer the following figure to solve the below problems.
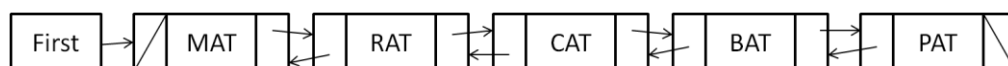
   a) With the help of the diagram show how the new data "NAT" is inserted after "BAT" into the double linked list shown in above figure.   (4M)

   b) Design the algorithm for the above.   (8M)

2. a) Explain stack with basic operations using array (push and pop).   (8M)

   b) Evaluate the given postfix expression using stack (show with steps of operations)   (4M)
   2 3 1 * + 9 -

3. a) Write an algorithm for a simple queue insertion to insert a new data. Use is Qfull( ) function in the algorithm to check whether queue is full or not.
                                                                                       (8M)

   b) Present positions of front = 2 and rear = 4, the data in Q: -, -, L, M, N, -
   What will happen to front & rear and Q after insert(O), insert(P), operations takes place in the Circular Queue?   (4M)

4. a) Write recursive algorithms for different traversals in a binary tree with examples? (9M)

b) Consider the set S= {5, 27, -4, 12, 42, 16} (3M)
Draw the Binary Search Tree 'T' by taking keys in the set S one at a time in the order. Assume the Binary Search Tree is initially empty.

5. a) Write an algorithm to sort the elements using heap sort. (8M)

b) Write the contents of the array after every pass using bubble sort.
{70, 60, 10, 5} (4M)

6. a) Write Kruskal's algorithm with an example. (8M)

b) For the graph given below draw the following using (4M)

   i) Adjacency list representation
   ii) Adjacency matrix representation

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