Roll No…….. **Total No. of Printed Pages: 1**

Total No. of Questions: [09]

B. Sc. (IT) (Semester – 3rd)
DATA STRUCTURES
Subject Code: BITE1309
Paper ID: 130411

Time: 03 Hours **Maximum Marks: 60**

Instruction for candidates:

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A **(2 marks each)**

Q1. Attempt the following:

a. What do you mean by algorithm complexity?
b. What do you mean by time and space tradeoff?
c. Distinguish between linear and non-linear data structures.
d. Distinguish between stack and queue.
e. How recursion is implemented using stacks?
f. What are priority queues?
g. Write any four applications of linked list.
h. What is the difference between full and complete binary tree?
i. What are the different binary tree traversal techniques?
j. Write any four types of binary trees.

Section – B **(5 marks each)**

Q2. Define and distinguish between insertion and selection sort.

Q3. Write the algorithm for different operations performed on a stack.

Q4. How expressions are converted to reverse polish notation using stacks?

Q5. Define double ended queues. What are the different types of double ended queues? Explain properties of each type.

Q6. How garbage collection is done? Explain.

Section – C **(10 marks each)**

Q7. How queues can be implemented using stacks? Explain.

Q8. Write the algorithms for the following operations on doubly linked lists

a. Insertion at beginning
b. Insertion at end
c. Deletion from beginning
d. Deletion from end

Q9. Write the algorithm for insertion in a binary search tree and then to print values of leaf nodes only.