Fourth Semester B.Tech. Degree Examination, September 2018
(2008 Scheme)
08.405 : DATA STRUCTURES AND ALGORITHMS (R F)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer all questions.

1. State any two linear data structures. What values are automatically stored for the array elements which are not explicitly initialised ?

2. State the operations on binary trees. What is the maximum number of nodes in a binary tree at level 4 ?

3. What are the different ways of representing a graph ?

4. What are the features of an efficient algorithm ?

5. Write the difference between a tree and graphs.

6. Define time complexity. What is asymptotic notation ?

7. What is Garbage collection ?

8. What is internal and external fragmentation ?

9. What are the two main classifications of sorting based on the source of data ?

10. Define Compaction. (10×4=40 Marks)
PART – B

Answer any one from each Module.

Module – I

11. a) A stack is to be implemented using arrays. Give the appropriate declarations and the statements for push and pop operations. 12
   b) Write short notes on analysis of an algorithm. 8

   OR

12. a) Explain how queues can be implemented using arrays. 12
   b) Write a discussion on applications of stacks with examples. 8

Module – II

13. a) Write an algorithm to convert infix to postfix expression and explain it with an example. 12
   b) What is the boundary tag method? Explain. 8

   OR

14. a) Write a complete discussion on operations of binary trees with examples. 10
   b) What is an almost complete binary tree? Explain with examples. 10

Module – III

15. a) Explain how external sorting is done with tapes. 10
   b) What is hashing? Explain. 10

   OR

16. Explain the following with examples:
   i) Partition exchange sorting. 10
   ii) Merge sort. 10