



Reg. No. :

Name :

**Fourth Semester B.Tech. Degree Examination, June 2017
(2008 Scheme)**

08.405 : DATA STRUCTURES AND ALGORITHMS (RF)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions :

1. Define algorithm. What are the features of an efficient algorithm ?
2. Explain the importance of dynamic programming.
3. Define non-linear data structure. Briefly explain the advantages of the same.
4. Define complete binary tree.
5. What is a graph ? Distinguish between simple and weighted graphs.
6. What are the two main classifications of sorting based on the source of data ?
7. What is Garbage collection ?
8. Explain the various applications of Depth First Search.
9. Write the postfix form of the expression $-A+B-C/D?$
10. What is a circular queue ? How do you test for an empty queue ? **(10×4=40 Marks)**

PART – B

Answer **any one** from **each** Module :

Module – I

11. a) Write an algorithm to check whether the given expression contains balanced parenthesis or not. 10
- b) Write an algorithm to create a stack and perform push and pop operations in it. 10

OR

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- 12. a) Write an algorithm for insertion and deletion operation in a circular queue. 10
- b) Write a discussion on applications of queues with examples. 10

Module – II

- 13. a) Write an algorithm to convert infix to prefix expression and explain it with an example. 10
- b) Define a binary tree. Explain with suitable examples. 10

OR

- 14. a) Explain the boundary tag method. 14
- b) What are a full and complete binary tree ? Explain with examples. 6

Module – III

- 15. a) State and explain the algorithm to perform merge sort. Also analyze the time complexity of the algorithm. 10
- b) Write an algorithm to initialize a hash table and perform insertion in a separate chaining. 10

OR

- 16. a) Explain the following with examples :
 - i) Heap sort. 10
 - ii) Insertion sort. 10
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