G 510 (Pages : 2)

B.TECH. DEGREE EXAMINATION, MAY 2014

Fourth Semester

Branch : Computer Science and Engineering/Information Technology

CS 010 403/IT 010 405—DATA STRUCTURES AND ALGORITHMS (CS, IT)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 3 *marks.*

1. State the principles of programming ?
2. State any three applications of stack and queue ?
3. What is meant by linked list ? Write down the types of linked list ?
4. Define tree and binary tree.
5. Write the function in C for insertion sort ?

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. What are the advantages and disadvantages of various collision resolution strategies ?
7. Explain the various applications of stack.
8. Give an algorithm to reverse the elements of a linked list without using temporary list ?
9. Formulate an algorithm to insert an element in a binary tree ?
10. Explain divide and conquer method sorting.

(5 × 5 = 25 marks)

Part C

Answer **all** *questions.*
Each question carries 12 *marks.*

11. What is open addressing hashing ? Describe any one technique.

Or

12. Explain in detail about rehashing and extendable hashing.

Turn over

13. Write an algorithm to find whether a particular element is present or not in a circular queue.

Or

14. Implement typical stack operation when stacks are represented using : (a) Arrays ; (b) using singly linked lists ?

15. Discuss the Doubly linked list and algorithm for the operations that can be performed on them in detail.

Or

16. Explain in detail about cursor based linked lists.

17. Explain the various tree traversal and predict a binary tree with Preorder: ABCDEFGHI and Inorder: BCAEDGHFI ?

Or

18. Formulate an algorithm to search an element in a Binary Tree.

19. Write the routine for sorting n elements in increasing order using heap sort.

Or

20. What is external sorting ? Discuss the algorithms with proper examples.

(5 × 12 = 60 marks)