Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 50274

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2012.

Third Semester

Electrical and Electronics Engineering

CS 1211 — DATA STRUCTURES AND ALGORITHMS

(Common to Instrumentation & Control Engineering and
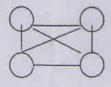Electronics & Instrumentation Engineering)

(Regulation 2004)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What do you mean by dynamically allocated array?

2. How are pointer arithmetic operations held in C?

3. With reference to circular queue, is there any possibility of having ISFULLQ( ) operation? Why?

4. What is a linked stack? Give illustration.

5. What is the tree whose preorder traversal results in +**/ABCDE?

6. Define a threaded binary tree.

7. What is a strongly connected directed graph ? Give examples.

8. Prove that the time complexity of recursive merging sort is $O(n \log n)$.

9. What is heap sort? Where is this preferred?

10. How many spanning trees you can derive from the following?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain ADT and their need. How the efficiency of recursion is computed?

      (ii) In C, describe the allocation of storage and scope of variables with examples.

Or

  (b) (i) Discuss the implementation issues of union and structures.

      (ii) Define recursive routines for factorial function and Fibonacci series.

12. (a) (i) Describe push and pop routines.

      (ii) Explain with examples, array implementation of priority queue.

Or

  (b) (i) Describe the primitive operations on circular list.

      (ii) How are linked lists used for polynomial addition? Explain.

13. (a) (i) Elaborately review the applications of binary trees.

      (ii) Describe binary tree traversals in C.

Or

  (b) (i) How do you evaluate expression using tree?

      (ii) Write down the routines for inserting and deleting from a Binary Search Tree.

14. (a) (i) What are the notations used for estimating the efficiency of sorting?

      (ii) What is radix sort? Write down the procedure and solve for an example.

Or

  (b) (i) Explain heap as a priority queue.

      (ii) Compare binary search with ternary search.

15. (a) (i) Write the linked representations of a graph.

      (ii) Explain DFS and its applications.

Or

  (b) (i) Write the procedure for Kruskal algorithm and round robin algorithm for obtaining minimum spanning tree.

      (ii) Write short notes on :

        (1) Shortest path   (8)

        (2) Transitive closure.   (8)