B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2003.

Second Semester

Computer Science and Engineering

CS 131 — PROGRAMMING AND DATA STRUCTURES

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   Define Top down and Bottom up approach.

2.   What do you mean by stepwise refinement?

3.   Give the advantages of modularity.

4.   What are the various control structures in C?

5.   Define aggregate data types and give example.

6.   Write any two applications of Doubly linked list.

7.   What are the various operations in stack?

8.   What is the advantage of circular linked list over linked list?

9.   Define path length theorem.

10. Define Binary search tree.

PART B — (5 × 16 = 80 marks)

11. Discuss structured programming in detail.

12. (a) (i)   Write any 8 input output functions of C language. Give the syntax
                of these function calls.   (8)

         (ii) Write a C program to check whether the two strings are equal.   (8)

Or

(b) (i) What is a preprocessor? Explain. (5)

(ii) Define functions in C and explain the usage of pointers in functions. (11)

13. (a) (i) Explain any three operations on a linked list. Write algorithms for these operations. (11)

(ii) Discuss the advantages of Circular queue with example. (5)

Or

(b) (i) Explain the applications of Linear linked list. (5)

(ii) What is a stack? Explain its operation. Write a algorithm, to check whether a string is of the form $W \subset W^R$. W is a string in $\{a, b\}$ and W^R is its reverse. Trace the contents of stack for an input string. (11)

14. (a) (i) Define various tree traversal methods. Write non recursive algorithm for inorder tree traversal. (11)

(ii) Explain the manipulation of arithmetic expression with the help of a tree with suitable example. (5)

Or

(b) (i) What are the various hashing techniques? Give suitable examples. (10)

(ii) What is clustering in a Hash table? Describe two methods for collision resolution. (6)

15. (a) Write algorithms for linear and binary search. Compare their complexities. (16)

Or

(b) Explain the structure and processing of sequential files. (16)

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