N 1247

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2004.

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. Draw the Nassi–Schneiderman diagram for checking whether the number is odd or even.

2. What is meant by locality in modular approach?

3. Distinguish between break and continue statements.

4. What are external variables? Give their scope in a C program.

5. List the advantages of representing stacks using linked lists than arrays.

6. Give the prefix form of infix expression (A*B+(C/D))–E.

7. State the properties of binary tree.

8. What is the time complexity of insertion sort?

9. Compare linear and binary search.

10. What are the factors to be considered while choosing a sorting technique?

PART B — (5 × 16 = 80 marks)

11. (i) Explain the structured programming methodologies in detail. (10)

(ii) Compare and contrast the top down and bottom down approach. (6)

12. (a) (i) Illustrate with suitable examples the various control constructs available in C. (10)

(ii) Write a C program to merge two arrays and display the merged array. (6)

Or

(b) (i) Write a C program to count the number of occurrences of a character in a string. (6)

(ii) Explain the various preprocessor directives with sample programs. (10)

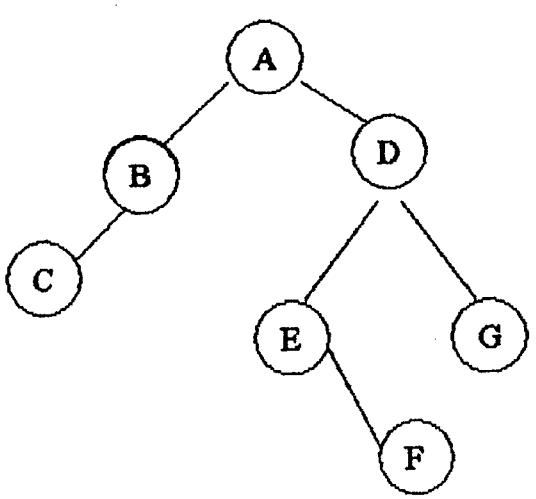
13. (a) What is a double linked list? State the advantages of using double linked list. Write the procedure to add and delete an element from the double linked list. (2 + 2 + 12)

Or

(b) (i) What is a stack? Write down the procedure for implementing various stack operations. (10)

(ii) Explain how Towers of Hanoi works in the case of 3 disks. (6)

14. (a) Explain the various tree traversal methods with algorithm for the above mentioned tree. (16)



Or

(b) Explain the various hashing techniques in detail. (16)

15. (a) (i) Write down the algorithm for binary search and compare the computational complexity of binary search with linear search. (6 + 4)

(ii) Differentiate sequential and random file organizations. (6)

Or

(b) (i) Explain the bubble sorting procedure. (8)

(ii) Trace out how bubble sort is carried out in following unsorted list. (8)

56 91 35 72 48 68