H 1187

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2006.

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. What is the use of modularity in programming techniques?

2. Write a recursion algorithm for the function $f(x) = 2f(x-1) + x^2$.

3. What are the primitive data types?

4. What is the function of preprocessor?

5. What are the advantages of linked list over array?

6. Give any two applications of stacks.

7. Write the pre-order, in-order, post-order traversal for the tree.
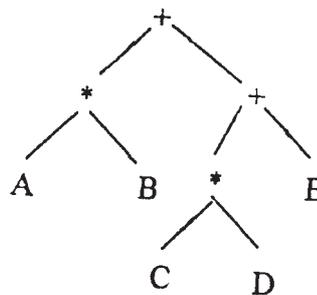
8. $A + (B - C)^* D \$(E^*F)$

   The above arithmetic expression is represented using a binary tree. Find the number of non-leaf nodes in the tree.

9. Choosing five numbers, illustrate the technique of bubble sorting.

10. What is hashing function?

PART B — (5 × 16 = 80 marks)

11. (i) Explain the various parts of the PSEUDO language used for developing algorithms. (8)

    (ii) Discuss the methodologies for structured programming. (8)

12. (a) (i) Write a C language function to determine the precedence between two operators in the given set of operators. (8)

    +, −, *, /, \$, (,)

    (ii) Explain with example various input/output statements in C. (8)

Or

    (b) (i) What is a preprocessor? (2)

    (ii) Describe the various control structures used in C language. (10)

    (iii) What are aggregate data types? Explain. (4)

13. (a) (i) Show the implementation of stack using a circular list. How will you decide stack full and stack empty? (8)

    (ii) Outline the steps involved in converting an infix expression into polish notation with the help of a stack. Trace the steps on the following expression. $\left((a+b)*c\right)-d$. (8)

Or

    (b) (i) Write an algorithm to insert a data in a linked list when the list is in the sorted form. (8)

    (ii) Write an algorithm for performing insertion into an input restricted queue. (8)

14. (a) (i) Formulate an algorithm to convert a general tree into binary tree. (8)

    (ii) Devise an algorithm for traversing a binary tree in pre-order. (8)

Or

    (b) (i) Explain about the various hashing functions. (8)

    (ii) What are the various methods of representing binary tree? Explain. (8)

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15. (a) (i) Discuss about the binary search algorithm and its limitations. Write a C language program as a function. (8)

(ii) Formulate an algorithm for insertion sort and trace the algorithm with example. (8)

Or

(b) (i) What is the main advantage of an indexed sequential file? Explain the two types of indexed sequential file processing. (8)

(ii) Explain the random access file processing. (8)

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