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B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2003.

Second Semester

Computer Science and Engineering

CS 131 — PROGRAMMING AND DATA STRUCTURES

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Define data structure and storage structure.

2. What is iteration? Give example.

3. What are primitive data types?

4. Compare the following statement : Break and Continue.

5. Differentiate singly linked list and circularly linked list.

6. Define stack.

7. What is hashing function?

8. Define single rotation on AVL tree.

9. Define direct access in a file.

10. What is the difference between binary tree and binary search tree?

PART B — ($5 \times 16 = 80$ marks)

11. (i) Write an algorithm for binary searching with example. Analyze the time requirement of the algorithm. (11)

(ii) Explain the structure of indexed sequential files. (5)

12. (a) (i) Explain in detail about top-down approach and bottom-up approach with suitable programming examples. (10)

(ii) Discuss about sequence selection iteration with examples. (6)

Or

(b) (i) What is recursion? Give the application of recursion with programs. (10)

(ii) What are the features of structured programming methodologies? Explain. (6)

13. (a) (i) What are the I/O statements used in 'C'? Explain with examples. (8)

(ii) Write a program to compute the sum of the digits in a number and also to reverse the digits. (8)

Or

(b) (i) Discuss various control functions used in C. (8)

(ii) Solve the following equations for x_1 and x_2 using C language : (8)

$$a x_1 + b x_2 = m$$
$$c x_1 + d x_2 = n.$$

14. (a) (i) What are the various stack operations? Explain. (6)

(ii) What are the various queue operations? Explain. (5)

(iii) Explain the application of stack for conversion of infix to postfix. (5)

Or

(b) (i) What are the advantages and disadvantages of doubly linked list over singly linked list? Explain the application of doubly linked list. (9)

(ii) Implement any two operations on circular linked list. (7)

15. (a) (i) Give a binary tree representation of the expression $(a + b)(c + d \uparrow e) \uparrow f$. (3)

(ii) What are the various tree traversal methods? Explain. (9)

(iii) Write an algorithm to convert general tree to binary tree. (4)

Or

(b) (i) List out the application of binary tree and explain. (6)

(ii) Describe various hashing techniques. (10)
