B 2139

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

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.   Discuss the needs for STEPWISE REFINEMENT.

2.   Define the term PSEUDO CODE and state its requirements.

3.   List the PRIMITIVE DATA TYPES provided in C language.

4.   State the needs for INPUT/OUTPUT PRE-PROCESSOR.

5.   List the operations defined on LIST data structure.

6.   Discuss the advantages of DOUBLY LINKED LISTS.

7.   Define the term BINARY TREE with its properties.

8.   Define the term TREE TRAVERSAL.

9.   Describe the term insertion in INSERTION SORT.

10. State the needs for FILES structure.

PART B — (5 × 16 = 80 marks)

11. (a) (i)   Develop a C language program using RECURSION to find minimum of all elements in a given array by comparing one element in the beginning and the rest of a given array.   (8)

          (ii) Define the terms associated with STRUCTURED PROGRAMMING METHODOLOGIES.   (8)

Or

(b) Develop a C language program using TOP-DOWN-DESIGN for printing MARK SHEET, given the student details and their marks. Student details are name of student with their initials at end and ten-digit registration number. Marks are given along with subject names. Students having more than 50 in all subjects are to be given PASS status and an average of 70 or more to be given FIRST CLASS status. Status is not given for all other students. (16)

12. (a) Develop a C language program that includes all types of control statements. (16)

Or

(b) Develop a C language program to initialise a two dimensional array with user specified values and another two dimensional array of same size with all entries equal to sum of its row and column values. Provide facilities in this C program to add or subtract one array from another as per users' choice and to print the resultant array in a rectangular format. (16)

13. (a) Develop C language program for initialising, inserting and deleting values in the QUEUE. (16)

Or

(b) Define the terms POINTER and NODE. Develop C language program for inserting and deleting values from a SINGLY LINKED LIST. (16)

14. (a) (i) Develop C language program for inserting and initialising a BINARY TREE of characters. (10)

(ii) Develop a C language program to store child values of a Binary Tree node on an one dimensional array starting with root of Binary Tree stored at first location of the given array. (6)

Or

(b) Develop C language program for traversing a given BINARY-TREE in different ways. (16)

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15. (a) Discuss the advantages of BINARY SEARCH. Develop C language program to search and print the existence or non-existence of a given value in an array of integers. (16)

Or

(b) Develop C language program to create a student data file to store name of student along with registration number and marks of five subjects. (16)

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