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Question Paper Code : P 1204

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2009.

Third Semester

Electrical and Electronics Engineering

CS 1211 — DATA STRUCTURES AND ALGORITHMS

(Common to Electronics & Instrumentation Engineering and Instrumentation & Control Engineering)

(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions

PART A — (10 × 2 = 20 marks)

1. Why is an array preferred instead of using a number of variables?

2. Give the recursive property of binary search algorithm.

3. Write the primitive operation of stack.

4. How does one represent the queue is empty?

5. What is called almost complete binary tree?

6. List the applications of binary tree.

7. Which method is called partition exchange sort?

8. Give the principle of diminishing increment sort.

9. List the application of Graphs.

10. What are the advantages of adjacency matrix representation of graph?

PART B — (5 × 16 = 80 marks)

11. (a) An automobile company uses an array, items to store the number of automobiles sold each year starting from 1983 to 1997. Write a C program for each of the following tasks :

(i) To find the total sales for all the items. (6)

(ii) To print the years in which maximum items were sold. (5)

(iii) To print the years in which minimum items were sold. (5)

Or

(b) (i) Write a program to compute fibonacci numbers. (6)

(ii) Write an iterative routine to implement Tower of Hanoi problem. (10)

12. (a) Convert each of the following infix expression to postfix expression.

(i) $X - Y + Z$ (4)

(ii) $(X + Y)/(Z - W)$ (4)

(iii) $X + Y / Z + W$ (4)

(iv) $X - (Y - (Z - W))$. (4)

Or

(b) (i) Illustrate the principle of array implementation of list and explain the limitation of this approach. (8)

(ii) Compare the dynamic and array implementation of list. (8)

13. (a) Construct a binary tree for the given preorder and inorder sequences as below :

Preorder : *a b c e i f j d g*. (8)

Inorder : *c i e f j b g d*. (8)

Or

(b) (i) Illustrate the threaded binary tree with specific example. (8)

(ii) Compare the threaded binary tree with ordinary binary tree. (8)

14. (a) Explain why the straight selection sort is more efficient than the bubble sort. Analyze this for the given numbers : (16)

25 57 48 37 12 92 86 32.

Or

(b) (i) What are the advantages and disadvantages of the sequential search algorithm. (8)

(ii) What are the main advantages of indexed sequential search over sequential search? (8)

15. (a) Explain briefly the following items :

(i) Diagraph. (4)

(ii) Adjacency list. (4)

(iii) Traversal of graph. (4)

(iv) C representation of graph. (4)

Or

(b) Illustrate the graph for the following :

(i) (1) Tree edges.

(2) Forward edges.

(3) Cross edges.

(4) Back edges. (8)

(ii) Illustrate the principle of Depth first traversal with specific example. (8)