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06CS35

Third Semester B.E. Degree Examination, June 2012
Data Structures with C

Time: 3 hrs.

Max. Marks: 100

**Note: Answer FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. Define pointer constants, pointer variables and pointer values. (04 Marks)
b. Write a program to add two integer numbers using pointers. (04 Marks)
c. What do you mean by casting pointers? Give example. (04 Marks)
d. Write a C function to implement binary search using pointers. (08 Marks)
- 2 a. Write a program to parse a simple algebraic expression using string token function. (04 Marks)
b. What is union? How it is different from structure? Write a program to add two complex numbers by passing pointers to the structure as an argument to the function and return type of function. (12 Marks)
c. Explain different file positioning functions. (04 Marks)
- 3 a. Write an algorithm using stack to test whether the given arithmetic expression is well balanced with parenthesis a not. Trace the algorithm for the expression $\{ x + (y - \{ a + b \}) * c - \{ (d + e) \} \}$ (10 Marks)
b. Transform each of the following expressions to prefix and postfix; (i) $A\$B*C-D+E/F/(G+H)$ (ii) $A-B/(C*D\$E)$. (04 Marks)
c. Write a C program to evaluate a postfix expression. (06 Marks)
- 4 a. State the Recursive solution for tower of Hanoi problem. Write recursive C program for solving the tower of Hanoi problem. (10 Marks)
b. What is priority queue? Explain different types of priority queues. (05 Marks)
c. Explain with an example advantages of circular queue over an liner queue. (05 Marks)

PART – B

- 5 a. What is a linked list? Compare static and dynamic implementation of linked list in C. (10 Marks)
b. Write routines in c to perform the following operation in dynamic single linked list;
(i) To insert X into its proper position within the list; (ii) To delete all nodes whose into field contains the value of X. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, $42+8=50$, will be treated as malpractice.

- 6** a. What are advantages of doubly linked list over single linked list? Write C routines to perform the following operations on doubly linked list; (i) To delete node pointed to by P; (ii) To insert node to the right of P. **(10 Marks)**
- b. Write a C program to implement stack as a circular list. **(10 Marks)**
- 7** a. Write an algorithm to construct binary tree for finding and eliminating duplicate numbers from the list of numbers. Trace the algorithm for the input ; 14, 15, 4, 9 ,7 , 18, 3, 5, 16, 4, 20, 17, 9, 14, 5. **(10 Marks)**
- b. Write the following functions for binary search tree; (i) Inserting a new node; (ii) For display. **(10 Marks)**
- 8** a. What do you mean by threaded binary tree? Write C routine to implement a right in threaded binary tree under dynamic representation. **(08 Marks)**
- b. Write an algorithm to find the K^{th} element in binary tree represented as list. **(06 Marks)**
- c. Construct expression tree for the following ; $(a + b) * c / (D - E)$. Give prefix and postfix versions. **(06 Marks)**

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