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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 pretix and postix; (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)**

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 Kth 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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