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06CS35

Third Semester B.E. Degree Examination, Dec.2013 / Jan. 2014
Data Structures with C

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast TWO question from each part.

PART - A

1. a. Write the syntax and usage of the following operators in C language :
 i) Selection ii) Indirection iii) Address. (06 Marks)
 b. What is meant by rvalue and lvalue expression? Give examples. (04 Marks)
 c. Distinguish between static and dynamic memory allocation. With syntax, explain four dynamic memory allocation functions. (10 Marks)
2. a. Write an user defined function in C to find if two fractions are equal. Use structure data type to store fraction. (06 Marks)
 b. Write a C program to merge two files of integers to produce a third file. (06 Marks)
 c. Write a C program to concatenate First name and Last name of a person without using any library function. (08 Marks)
3. a. Define stack. List atleast four applications of stack. (05 Marks)
 b. Write an algorithm for evaluating a post fix expression and trace it on $123 + * 321 + + *$. (08 Marks)
 c. Write C functions for implementing primitive stack operations. (07 Marks)
4. a. What is recursion? Evaluate fib(4), that is finding 4th term of Fibonacci sequence using recursion and iteration. Which is better? (08 Marks)
 b. Write the static implementation of priority queue in C language. With illustration, explain major limitation of such a queue. (12 Marks)

PART - B

5. a. Give the structural features of a linked list. Discuss how an array can be used to store a linked list. (05 Marks)
 b. Given a singly linked list with plist as the external pointer, write an algorithm to insert a new node to the end of the list. Assume nodes hold integers. (05 Marks)
 c. How is a stack implemented using linked list? Write C program for the same. (10 Marks)
6. a. What is a circularly linked list? Write algorithm for merging two circularly linked lists. (07 Marks)
 b. Write the algorithm for deleting the first occurrence of a given value from a doubly linked list. (08 Marks)
 c. Discuss how to implement a queue using circular linked list. (05 Marks)
7. a. Define complete binary tree and almost complete binary tree. Give examples. (05 Marks)
 b. With suitable example, explain implicit array representation of binary search tree. (05 Marks)
 c. What is a binary search tree? Write an algorithm to construct a binary search tree. (10 Marks)
8. a. What is tree traversing? Explain the standard methods available for tree traversing. (10 Marks)
 b. Write short notes on : i) Circular queue ii) Efficiency of recursion. (10 Marks)