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06CS35

Third Semester B.E. Degree Examination, June/July 2013
Data Structure with C

Time: 3 hrs. Max. Marks:100

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

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.

PART – A

1 a. Define pointers? Explain how pointer variables can be declared and initialized, with example. **(06 Marks)**

b. Explain call by value and call by reference, with example program. **(06 Marks)**

c. What is dynamic memory allocation? What are its demerits? Explain with example. **(08 Marks)**

2 a. Write a program to parse the string "SUM = SUM + 10;" into number of tokens using a white space and semicolon(;) as a delimeters. **(08 Marks)**

b. Differentiate between structure and union. **(05 Marks)**

c. Explain file positioning and file error functions. **(07 Marks)**

3 a. Define stack as a data structure and discuss its applications. **(05 Marks)**

b. Write an algorithm to evaluate a postfix expression and apply the same for the postfix expression ABC – D * + E $ F + and assume A = 6, B = 3 C = 2, D = 5, E = 1, F = 7. **(10 Marks)**

c. What is a recursive function? Mention its merits and demerits. **(05 Marks)**

4 a. What is the disadvantage of ordinary queue? Write a C program to implement circular queue using arrays, with operations of INSERT, DELETE and DISPLAY. **(08 Marks)**

b. What is a priority queue? Discuss its implementation. **(06 Marks)**

c. Write a recursive function for the following :
   i) To find GCD of two numbers
   ii) To search an element using binary search. **(06 Marks)**

PART – B

5 a. What are the advantages and disadvantages of linked list over an array? How do you represent singly linked list in C. **(06 Marks)**

b. In a singly linked list write the C function to
   i) Reverse a given list
   ii) Create an ordered linked list. **(08 Marks)**

c. Write an algorithm to insert and delete an element from front end of circular linked list. **(06 Marks)**

6 a. Enlist the advantages and advantages of doubly linked list over singly linked list. **(05 Marks)**

b. Write an algorithm to insert a new node to the left of the node whose key value is read as an input. **(07 Marks)**

c. Write a C program to implement stack using singly linked list. **(08 Marks)**

7 a. Define the following, with example :
i) Tree ii) Binary tree iii) Strictly binary tree
iv) Completely binary tree v) Binary search tree. **(10 Marks)**

b. Define postorder and preorder traversal of a tree. Given the postorder and inorder traversal, construct a single binary tree.
Postorder : J H D E B I F G C A
Inorder : D J H B E A F I C G. **(10 Marks)**

8 Write a short note on :
a. Type definition (typedef)
b. Enumerated data type
d. Header node
c. Binary search tree. **(20 Marks)**

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