Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

Roll No .....

MCADD-202

M.C.A. (Dual Degree/Integrated Course), II Semester

Examination, December 2017

Data Structure Using C

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions out of eight questions.
ii) All questions carry equal marks.

1. a) What is stack? Why stack is called LIFO data structure? Implement the push and pop operation on stack. 7
   b) What are the drawback of linear queue? Write a program to perform insertion and deletion operation on linear queue. 7

2. a) What is doubly linked list? Compare doubly linked list and singly linked list. Write various applications of linked list. 7
   b) Write a program to remove all duplicate elements from a linear list. 7

3. a) What is binary tree? Prove that the total number of edges in a complete binary tree with n terminal nodes is $2(n-1)$ 7
   b) Construct a binary tree whose inorder and postorder traversal are as follow: 7
   Inorder - D, B, A, E, C, G, F, H
   Postorder - D, B, E, G, H, F, C, A

4. a) What is priority queue? What are the different ways to maintaining a priority queue in memory? 7

   b) Translate the following infix expression into its equivalent postfix form: 7

   i) $(A + B \uparrow D)/(E - F) + G$

   ii) $A \,\&\&\, B \,||\, C \,||\, !(C > D)$

   iii) $((A + B)/D) \uparrow ((E - F) * G)$

5. a) What is sorting? Explain Heap sort procedure with proper example. 7

   b) What is hashing? Explain various methods to find hash functions. 7

6. a) What do you mean by spanning tree? Write Kruskal's algorithm to find minimum spanning tree. 7

   b) Write about various rotations performed to balance an AVL tree. Construct AVL tree by inserting the following elements into an empty AVL tree: 7

   2, 10, 3, 9, 4, 8, 7, 5, 6

7. a) What are the difference between B-tree and B+tree? Construct the B-tree of order 5 of the following data values: 7

   1, 7, 6, 2, 11, 4, 8, 13, 10, 5, 19, 9, 18, 25, 3, 12, 15, 22, 23, 17

   b) What do you mean by forest? How will you convert forest into tree? 7

8. Write a short note on (any four) 14

   a) Shell sort and tree sort

   b) Threaded binary tree

   c) Dynamic memory management

   d) Collision resolution techniques

   e) String processing

   f) Graph representation

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