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## BMS College of Engineering, Bangalore-560019

(Autonomous Institute, Affiliated to VTU, Belgaum)

January 2015 Semester End Make Up Examinations

**Course: Data Structures**  
**Course code: 09CI3GCDSL**

**Duration: 3 hours**  
**Max Marks: 100**  
**Date:25.01.2015**

### Instructions:

Answer any **five** full questions, choosing one full question from each unit.

#### UNIT – I

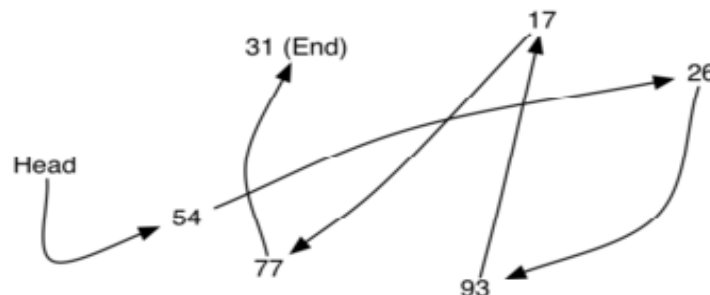
- 1 a What do you understand by Dynamic Memory Allocation? Explain the functions that support dynamic memory allocation. 10
- b List the differences between structures and union. Create a structure STUDENT with Register\_no, Name, and Marks1, Marks2, Marks3. Write functions read\_data() and print\_data() to read and display Five students details. 10

#### OR

- 2 a What are the advantages and disadvantages of representing a group of items as an array versus a linear linked list? 8
- b Write C routines using both array and dynamic variable implementation of a linked list to delete the  $n^{\text{th}}$  element from a list. 12

#### UNIT – II

- 3 a 10



Use a suitable data structure to build the above diagram. Write function for the same to build it, sort it and later display the information in their units place value only in reverse order.

- b Form a linked list containing union (u\_EL) and intersection (i\_EL) of elements of 2 lists provided. L1 : 1->2->3->4->5->6 L2 : 2->4->6 . Display the u\_EL and i\_EL for the operations. 6

- c Write a program to receive command line argument as “**Hi Hello**” and print the same. 4

**OR**

- 4 a Write a program to write record of students to a file using array of structures and from the file, print the records onto the screen (monitor). 8
- b Explain any four file error handling operations with syntax . 6
- c Demonstrate the frequency of occurrence of a number within a doubly linked list. 6

**UNIT – III**

- 5 a Convert the following infix notation into its equivalent prefix and Postfix notation. 8  
 $(A + B) * ((C * D) + E) * F$   
 Give an algorithm to evaluate any postfix expression. [Note:\$ indicates Exponentiation]
- b The following sequence of operations is performed on a stack. 4  
 PUSH A, PUSH B, PUSH C, POP, PUSH D, POP, POP, PUSH E, POP, POP.  
 What is the sequence of popped elements?
- c Compare Iterative technique with the Recursive technique and explain the Tower of Hanoi problem with an algorithm 8

**UNIT – IV**

- 6 a What are the drawbacks of ordinary queue? How it is resolved in Circular queue? Explain with diagram. 6
- b What is priority queue? Explain with example. 4
- c Write a C program to insert and delete an element from the front end of the Doubly Ended Queue. 10

**UNIT – V**

- 7 a Construct tree with the given traversals, **preorder**: ABDGCEHIF, **inorder**: DGBAHEICF. Write recursive functions for tree traversals. 10
- b Explain left –in-threaded trees. 5
- c Write a program to find minimum and maximum in a binary search tree. 5

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