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BMS College of Engineering, Bangalore-560019

(Autonomous Institute, Affiliated to VTU, Belgaum)

December 2012/January 2013 Semester End Examinations

Course: Data Structures

Course code: 09CI3GCDSL

Duration: 3 hours

Max Marks: 100

07.01.2013

Instructions : Answer any five full questions choosing one from each unit.

UNIT – I

1. a) Differentiate between static memory allocation and dynamic memory allocation. 5
- b) With an example, explain the concept of pointers to functions. 5
- c) Write a program implementing circular SLL with a header node including operations as inserting a new node at a position given by the user, deleting a node from the rear end and display of the linked list. 10

OR

2. a) Define Data structures. Write about the classification of data structures. 5
- b) Show an example of passing an array to a function. Use pointers. Explain. 5
- c) Write a program to make a DLL where each node is a structure holding employee data as empno, empname and empsal. Include operations such as insertion at the rear end, deleting a node whose key value is given and displaying the list. 10

UNIT – II

3. a) Write algorithm to implement the following on a singly linked list: 6
 - i) To reverse set of values in the list.(without creating new node)
 - ii) To replace all the occurrences at a given value by other value from the list.
- b) Discuss Addition of two long integers using linked list. 4
- c) Develop a C program to write data of employees into a file. Each employee is a structure with the following members: Char name[10],float salary, int id, char designation[10] .Further read the data from the file and display it on the console in ascending order of ids. 10

OR

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| 4. | a) | Write a C program using dynamic variables and pointers, to construct a singly linked list consisting of the following information in each node: student id (integer), student name (character string) and semester (integer). The operations to be supported are: | 10 |
| | | i) The insertion operation at any position in the list by scanning position from user. | |
| | | ii) Searching a node based on student id and update the information content. If the specified node is not present in the list an error message should be displayed. Both situations should be displayed. | |
| | | iii) Displaying all the nodes in the list. | |
| | b) | Write a note on I/O file functions. | 5 |
| | c) | What are command-line arguments? Illustrate with a simple program. | 5 |

UNIT – III

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| 5. | a) | Give the algorithm that converts an infix expression to a postfix expression. | 8 |
| | b) | Define Stack. Write a program that implement stacks using pointers. | 8 |
| | c) | Write any two advantages and disadvantages of recursion. | 4 |

UNIT – IV

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| 6. | a) | Write a 'C' program to implement insert, delete and display operations of a circular queue. | 5 |
| | b) | Differentiate Linear queue and priority queue. | 3 |
| | c) | Write 'C' functions to implement insert-rear, insert-front, delete-rear and delete-front in a double ended queue. | 12 |

UNIT – V

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|----|----|---|----|
| 7. | a) | Write an iterative procedure for pre-order traversal and explain. | 5 |
| | b) | Write a 'C' function to delete an item in a binary search tree. Explain with examples for each case | 10 |
| | c) | Differentiate Left-in thread and right-in thread binary tree. | 5 |
