Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov/Dec– 2017**

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| **Code :** | **14CS2009** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DATA STRUCTURES** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Briefly discuss about the arrays and the address calculations in one dimensional and two dimensional arrays when it is stored in row major order and column major order. | CO1 | 10 |
| b. | Discuss the implementation of Circular Queue data structure. | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | Write the pseudocode/C++ code and explain the conversion of infix expression to postfix expression using stack? Apply the algorithm for the below given infix expression to find the equivalent postfix expression.  A = B + ( C / D ) \* E | CO3 | 10 |
|  | b. | Explain the algorithm for postfix expression evaluation and show the step by step procedure of expression evaluation with a suitable input. | CO3 | 10 |
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| 3. |  | Explain the implementation (Insertion, Deletion, and Display) of Singly Linked List and Doubly Linked List data structure with the help of C/C++ program. | CO1 | 20 |
| (OR) | | | | |
| 4. |  | Discuss in detail how a Stack and Queue can be implemented using Linked List. | CO3 | 20 |
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| 5. | a. | Briefly discuss about linear search and binary search with the help of pseudocodes. | CO2 | 10 |
|  | b. | Write the Insertion sort algorithm. Apply it to alphabetically sort the list of characters K,A,R,U,N,Y,A,U,N,I,V,E,R,S,I,T,Y. | CO2 | 10 |
| (OR) | | | | |
| 6. |  | Explain in detail about Hashing and various methods used for collision resolution in hashing with suitable examples and diagrams. | CO2 | 20 |
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| 7. | a. | Discuss various Tree traversal techniques with its pseudocodes and examples. | CO3 | 10 |
|  | b. | Explain the two different ways of representing Tree data structure in memory with suitable examples and diagrams. | CO1 | 10 |
| (OR) | | | | |
| 8. |  | What is an AVL tree? Define balance factor of an AVL tree? Discuss about the four rotation types in AVL tree with examples. Construct an AVL tree for the list 1, 2, 3, 4, 5, 6, 7, 8, 9. | CO3 | 20 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Explain Dijkstra’s shortest path algorithm with the help of following diagram by taking ‘P’ as source vertex. | CO3 | 10 |
|  | b. | Explain in detail about the various graph traversal methods. | CO3 | 10 |

ALL THE BEST