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

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**End Semester Examination – Nov/Dec – 2018**

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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. | Discuss the implementation of stack data structure using array with necessary pseudocodes. | CO1 | 10 |
| b. | Describe 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 |
| (OR) | | | | |
| 2. | a. | Demonstrate how stack is used for solving Tower of Hanoi problem recursively with suitable diagram. | CO1 | 10 |
| b. | Write the pseudocode 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^F-H | CO1 | 10 |
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| 3. | a. | Demonstrate the implementation of circular queue with a neat sketch and required algorithm. | CO1 | 10 |
| b. | Explain the algorithm for insertion in a singly linked list with an example. | CO1 | 10 |
| (OR) | | | | |
| 4. |  | Discuss the linked list implementation of Stack and Queue. | CO1 | 20 |
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| 5. | a. | Differentiate linear search and binary search with respect time complexity. Apply binary search for the element 78 in below mentioned array  32 45 61 70 82 88 90 99 | CO2 | 10 |
| b. | Write the Selection sort algorithm. Apply it to alphabetically sort the list of characters D,A,T,S,R,U,C,E,B,J. | CO2 | 10 |
| (OR) | | | | |
| 6. | a. | Illustrate separate chaining technique for collision resolution in hashing with example. | CO2 | 10 |
| b. | Demonstrate merge sort technique to sort the numbers 54 26 13 33 52 97 43 29 88 66 in descending order. | CO2 | 10 |
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| 7. |  | Discuss various Tree traversal techniques with its pseudocodes and examples. Do in-order, post-order and pre-order traversals on the following tree: | CO3 | 20 |
| (OR) | | | | |
| 8. |  | Construct B-tree of order 3 with the following values by inserting them one by one in the order given: 9, 7, 5, 40, 1, 19, 34, 43, 17, 20, 18, 22, 42, 11, 2, 4 | CO3 | 20 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Explain Kruskal’s algorithm in detail and apply it on the weighted graph given below?  C:\Users\Akshaya\Desktop\DS\2.png | CO3 | 10 |
| b. | Give the adjancy matrix and adjancy list for the following graph  C:\Users\Akshaya\Desktop\DS\4.png | CO3 | 10 |