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



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **17BI2004** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DATA STRUCTURE AND OOPS IN C++** | **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. | Write an algorithm to insert an element at the right of a node pointed by ‘P’ to a Singly linked list. | CO1 | 10 |
| b. | Compare Stack and Queue data structures. Explain the operations of Stack using suitable illustrations. | CO2 | 10 |
| (OR) | | | | |
| 2. | a. | Discuss the benefits of Circular linked list as compared with the Singly linked list. | CO1 | 6 |
| b. | Construct a Binary search tree (BST) by inserting the following keys in an empty BST.  Re-draw the BST after deleting the root. | CO3 | 14 |
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| 3. | a. | Write an algorithm for Insertion sort to arrange the set of numbers in ascending order. | CO3 | 10 |
|  | b. | Demonstrate the working of Bubble sort in sorting the following data list. | CO3 | 10 |
| (OR) | | | | |
| 4. | a. | Explain the QuickSort algorithm with suitable illustrations. | CO3 | 10 |
|  | b. | Write an algorithm to perform Linear search on ‘N’ data elements for a given key ‘K’. Discuss the worst case and best case complexities of Linear search algorithm. | CO3 | 10 |
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| 5. | a. | Describe the characteristics of Object-oriented programming (OOP) approach and mention the advantages of OOP approach over Procedural programming approach. | CO4 | 10 |
|  | b. | Explain the various looping control statements in C++ with suitable programs. | CO5 | 10 |
| (OR) | | | | |
| 6. | a. | Explain function overloading concept with suitable example. | CO4 | 10 |
|  | b. | Write a program to compute grade according to the mark obtained out of 100.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Mark | <50 | 50-60 | 60-70 | 70-80 | 80-90 | >90 | | Grade | F | E | D | C | B | A | | CO5 | 10 |
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| 7. | a. | Create an Employee class comprises of data members such as emp\_id, emp\_name, position and salary and member functions for reading and printing the details of employees. Write a main () that allows the user to enter data for three employees and display it. | CO6 | 10 |
|  | b. | Write a C++ program to illustrate the concept of passing objects as function arguments. | CO4 | 10 |
| (OR) | | | | |
| 8. | a. | Write a program to read two String values from the user and check whether these strings are identical or not. | CO6 | 10 |
|  | b. | Define constructor. Explain the different type of constructors in C++. | CO4 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Explain the concept of inheritance. Discuss the various types of inheritance in C++. | CO4 | 10 |
|  | b. | Write a program to perform standard input and output operations in a text file. | CO6 | 10 |