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**Name of the Student: -----------------------------Academic Year: 2023 -2024 Subject:** OOP & CG LAB **Class:**SE **Roll No.:** --------------- **Sem: I**

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**Object Oriented Programming**

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| **Sr. No** | **Name of the Experiment Tutorial** | **Page No** | **Date of Performance** | **Sign of Teacher & Date** | **Remark** |
| **1.** | Implement a class Complex which represents the Complex Number datatype. Implement the following:   1. Constructor (including a default constructor which creates the complex   number 0+0i).   1. Overload operator+ to add two complex numbers. 2. Overload operator\* to multiply two complex numbers. 3. Overload operators << and >> to print and read Complex Numbers. |  |  |  |  |
| **2.** | Develop a program in C++ to create a database of student’s information system containing the following information: Name, Roll number, Class,Division, Date of Birth, Blood group, Contact address, Telephone number,Driving license no. and other. Construct the database with suitable memberfunctions. Make use of constructor, default constructor, copy constructor, destructor, static member functions, friend class, this pointer, inline code and dynamic memory allocation operators-new and delete as well as  exception handling. |  |  |  |  |
| **3**. | Imagine a publishing company which does marketing for book and audio cassette versions. Create a class publication that stores the title (a string) and price (type float) of publications. From this class derive two classes: book which adds a page count (type int) and tape which adds  a playing time in minutes (type float).Write a |  |  |  |  |

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|  | program that instantiates the book and tape class, allows user to enter data and displays the data members. If an exception is caught, replace all the data member values with zero values.data and displays the data members. If an exception is  caught, replace all the data member values with zero values. |  |  |  |  |
| **4.** | Write a C++ program that creates an output file, writes information to it,closes the file, open it again as an input file and read the information  from the file. |  |  |  |  |
| **5.** | Write a function template for selection sort that inputs, sorts and outputs an integer array and a  float array. |  |  |  |  |
| **6.** | Write C++ program using STL for sorting and searching user defined records such as personal records (Name, DOB, Telephone number etc)  using vector container. |  |  |  |  |
| **7.** | Write a program in C++ to use map associative container. The keys will be the names of states and the values will be the populations of the states When the program runs,the user is prompted to type the name of a state.The program then looks in the map, using the state name as an  index and returns the population of the state. |  |  |  |  |
| **Computer Graphics** | | | | | |
| **8.** | Write C++ program to draw a concave polygon and fill it with desired color using scan fill  algorithm. |  |  |  |  |
| **9.** | Write C++ program to implement Cohen  Southerland line clipping algorithm. |  |  |  |  |
| **10.** | Write C++ program to draw the following pattern. Use DDA line and Bresenham‘s circle drawing algorithm. Apply the concept of encapsulation. |  |  |  |  |
| **11.** | Write C++ program to draw 2-D object and perform following basic transformations: 1. Scaling 2. Translation 3. Rotation. Apply the  concept of operator overloading. |  |  |  |  |
| **12.** | Write C++ program to generate fractal patterns by  using Koch curves. |  |  |  |  |
| **13.** | Write OpenGL Program to draw Sunrise and Sun Set. |  |  |  |  |
| **14.** | Write C++ program to generate Bouncing ball. Apply the concept of polymorphism. |  |  |  |  |