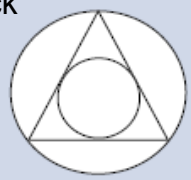
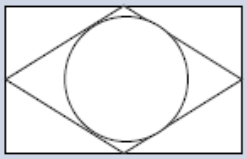
	Object Oriented Programming
	GROUP A
1	Implement a class Complex which represents the Complex Number data type. Implement the following 1. Constructor (including a default constructor which creates the complex number 0+0i). 2. Overload operator+ to add two complex numbers. 3. Overload operator* to multiply two complex numbers. 4. 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 member functions. 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 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
	GROUP B
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.
	GROUP C
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. **OR** Write C++ program using STL for sorting and searching user defined records such as Item records (Item code, name, cost, quantity 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
	GROUP A
1	a) Write C++ program to draw the following pattern. Use DDA line and Bresenham' circle algorithm. Apply the concept of encapsulation. 1 assignment is there for CG Mock  **OR** a) b) Write C++ program to draw the following pattern. Use DDA line and Bresenham' Circle drawing algorithm. Apply the concept of encapsulation. 
2	Write C++ program to draw a concave polygon and fill it with desired color using scan fill algorithm. Apply the concept of inheritance.
3	Write C++ program to implement Cohen Southerland line clipping algorithm.
	GROUP B
4	a) Write C++ program to draw 2-D object and perform following basic transformations, Scaling b) Translation c) Rotation. Apply the concept of operator overloading. OR b) Write C++ program to implement translation, rotation and scaling transformations on equilateral triangle and rhombus. Apply the concept of operator overloading.
5	a) Write C++ program to generate snowflake using concept of fractals. OR b) Write C++ program to generate Hilbert curve using concept of fractals. OR c) Write C++ program to generate fractal patterns by using Koch curves.
6	Write C++ program to simulate any one of or similar scene- **a)** Clock with pendulum **OR** b) National Flag hoisting OR

	c) Vehicle/boat locomotion OR d) Water drop falling into the water and generated waves after impact Kaleidoscope views generation (at least 3 colorful patterns) **OR** a)Design and simulate any data structure like stack, queue, and trees visualization using graphics. Simulation should include all operations performed on designed data structure. Implement the same using OpenGL. **OR** b) Write C++ program to draw 3-D cube and perform following transformations on it using OpenGL i) Scaling ii) Translation iii) Rotation about an axis (X/Y/Z). **OR** c) Write OpenGL program to draw Sun Rise and Sunset.
	MINI Project / Case – Study
7	Design and implement game / animation clip / Graphics Editor using open source graphics library. Make use of maximum features of Object Oriented Programming.