CHENNAI INSTITUTE OF TECHNOLOGY

Date	19/12/2024	Max. Marks	100 Marks
Sub. Code/Title	CS4102/C++ Programming	Duration	3 hrs
Branch	Common to CSE,IT,AIDS,AIML,CS,CSBS	Year/Semester	I/I

Course Objectives:
1. To give a foundation in C programming.
2. To provide comprehensive understanding of object-oriented principles.
3. To gain advanced knowledge of the concepts such as inheritance and polymorphism in C++.
4. To equip with advanced C++ skills in exception handling and generic programming.
5. To handle the files using C++.

Course Outcomes:

At the end of course the students can able to

CO	Statement	RBT Level
CO1	Solve complex problems using modular and maintainable C code.	L1
CO2	Implement object oriented features including classes , object oriented principles	L2,L3
CO3	Implement string handling , polymorphism and inheritance using c++.	L2,L3
CO4	To equip with advanced C++ skills in exception handling and generic programming.	L3
CO5	To handle the files using C++.	L3

Blooms Taxonomy Level
L1 – Remembering, L2 – Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 – Creating

	PART-A (10 X 2 = 20) (Answer all the questions)	CO Mapping	BT Level
1	Define a function in C and provide a simple example.	CO1	L2
2	What is the use of the sizeof operator?	CO1	L2
3	Write a short note on pointer declaration and initialization.	CO2	L1
4	How do you declare a constant member variable in a class? Provide an example.	CO2	L2
5	Given a string char str[] = "Hello, World!";. Write a C++ code snippet to print the length of the string.	CO3	L3
6	What is the difference between static and dynamic memory allocation ?	CO3	L2
7	Name two commonly used standard libraries in C++.	CO4	L1
8	How does std::bind function as a function adaptor?	CO4	L2
9	How the file stream is closed after performing file operations in C++.	CO5	L2
10	Can functions within a namespace be overloaded? Provide a yes or no answer.	CO5	L2

PART- B (5 X 16 = 80)

11	a) Discuss the different types of loops statements in C, explain the importance of loop control statements.	CO1	L2	16
	(OR)			
	b) (i) Discuss the different data types available in C with a suitable program.	CO1	L2	10
	b) (ii) Explain the significance of constants and variables in C. How are constants defined and used in C? Provide examples to illustrate the difference between constants and variables.	CO1	L2	6
12	a) Explain the concepts of data abstraction and encapsulation in C++. How do they differ, and how are they implemented in C++? Provide examples to illustrate your answer.	CO2	L2	16
	(OR)			
	b) What are member functions in C++? Explain the different types of member functions with appropriate examples. How do inline member functions differ from regular member functions?	CO2	L2	12
	Discuss about methods and messages in class.	CO2	L2	4
13	a) Create a C++ program that dynamically allocates a list of Student objects. Each Student has a name and a grade. Implement a function to find the student with the highest grade. Also write code to free the allocated memory after use.	CO3	L3	16
	(OR)			
	b) Differentiate the multiple and multilevel inheritance and implement a C++program for Inheritance for calculating the area of a triangle.	CO3	L3	16
14	a) Create a max function template using template keyword. Create a template parameter using the declaration <typename T>. This template should act as place holder for the actual type that will be used when the function is instantiated. The max function created takes two parameters of the type T and should return the maximum of two values. Create a main function. This template should be used by calling both integer and double values.	CO4	L3	16
	(OR)			
	b) Explain the concepts of containers in Standard template library with suitable examples.	CO4	L2	16
15	a) Write a C++ program for a student data storage application designed to manage information for a school with 500 students. The application uses file handling to store and retrieve student records. The program uses a structure Student defined with attributes: rollNumber (integer), name (string), and marks (double). Read all the student data from the user through keyboard.	CO5	L3	16
	(OR)			
	b) (i) Write a C++ program to read student records from a file and calculate their total and percentage.	CO5	L3	8
	b) (ii) What is a file? Explain the types of files with operations performed on a file. List the advantages of storing data in files.	CO5	L2	8