CHENNAI INSTITUTE OF TECHNOLOGY

(An Autonomous Institution, Affiliated to Anna University, Chennai)
CHENNAI - 600 069

B.E. / B.Tech. DEGREE END SEMESTER EXAMINATIONS
NOV / DEC 2024
First Semester
CS4102 – C++ PROGRAMMING
(Common to CSE / IT / AIDS / CSBS / CSE-AIML / CSE-CS)
(Regulations 2024)

Time: Three Hours

Maximum Marks: 100

Answer ALL Questions

RBT Level : L1- Remembering, L2 – Understanding, L3 – Applying, L4 – Analyzing, L5 – Evaluating, L6 – Creating

PART – A **(10x2=20 Marks)** CO

1. How do you declare a string in C? CO1
2. Implement a C program to print half pyramid using '*'. CO1
3. How is a parameterized constructor declared in C++? Provide an example. CO2
4. List out the uses of C++ programming. CO
5. What is compile-time polymorphism? Give an example. CO
6. State the difference between static and dynamic memory allocation. CO
7. How do you declare a pure virtual function in an abstract class? CO4
8. What are the primary components of the STL? CO4
9. How the file stream is closed after performing file operations in C++? CO5
10. Give an example of a simple if-else statement. CO5

PART - B **(5x16=80 Marks)** CO

11. a) Explain the general structure of a C program. Describe each component in detail with an example program to demonstrate the use of #include directives, main() function, and various sections. CO1

(OR)

b) i) Write a C program to Implement Employee details and salary calculation using structure concept.

ii) Write a C program to Implement electricity bill using structure concept.

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

(OR)

b) i) What are storage classes in C++? Explain the different types of storage classes with examples. How do they affect the lifetime and visibility of variables? CO2

ii) Write a C++ program to demonstrate the use of pointers and references. Create a function to swap two integer values using pointers and another function to swap two integer values using references. CO2

13. a) Write a C++ program that demonstrates function overloading by implementing multiple versions of a print function that can handle different data types: int, double, and std::string. CO3

(OR)

b) i) What is dynamic memory allocation in C++? How does it differ from static memory allocation? What are the pros and cons of using dynamic memory allocation? Show an example of using the new and delete operators. CO

ii) Differentiate the multiple and multilevel inheritance and implement a C++program for Inheritance for calculating the area of a triangle. CO

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. C

(OR)

b) i) Discuss the concept of Generic Programming in C++. How does Generic Programming enhance code reusability and flexibility? C

ii) How do std::vector and std::deque differ in terms of performance and use cases?

15. a) i) Implement a C++ program to read data from an existing file. Explain the steps to open the file in this program and also handle the case where the file doesn't exist.

ii) Write a C++ program to read student records from a file and calculate their total and percentage

(OR)

b) Discuss different error handling techniques in file I/O operations in C++. Provide examples of how to handle errors when opening files, reading from files, and writing to files. Explain how the fail(), eof(), and bad() functions are used to check for file stream errors.