



B.Tech (CSE) Mid Semester Examination, Nov, 2025

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Name of the Course and semester: **B.Tech(CSE)) 3rd Semester**

Paper Name **Object Oriented Programming With C++**

Time: 1.5 Hours

Paper Code: **TCS307**

Max Marks: 50

Note:

- (i) Answer all the questions by choosing any one of the sub-questions
- (ii) Each question carries 10 marks.

Q1.

(CO1)

a. Explain the Object-Oriented Programming paradigm. Discuss how encapsulation, abstraction, inheritance, and polymorphism make C++ superior to procedural languages like C.

OR

b. Write a C++ program demonstrating **function overloading** for finding the area of a circle, rectangle, and triangle.

Q2.

(CO1)

a. Assume you have two functions with the same name but defined in different namespaces. Both are required in your current program. Write programs that solve this scenario using all possible approaches.

Example:

Define two show() functions in different namespaces with your own definitions. Demonstrate how both can be accessed in a single program.

OR

b. Construct a C++ program that removes a specific character from a given string and returns the updated string.

Example:

Input: computer science is the future

Output: compuer science is he fuure

Q3.

(CO2)

a. A class TelCall calculates the monthly phone bill of a consumer. Some of the members of the class are given below:

Class name: TelCall

Data members: phno (Phone Number), sname (Subscriber Name), n (Number of calls made), and amt (Bill amount).

Member functions:

- TelCall() – Parameterized constructor to assign values to data members.
- void compute() – Calculates the phone bill amount based on the slabs given below.



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- void display() – Displays the details in a specified format.

Number of Calls	Rate
1 – 100	₹500 rental charge only
101 – 200	₹1.00 per call + rental charge
201 – 300	₹1.20 per call + rental charge
Above 300	₹1.50 per call + rental charge

OR

b. What are **constructors** and **destructors**? Write a C++ program to demonstrate **default**, **parameterized**, and **copy constructors** in the same class.

Q4.

(CO2)

a. Create a class named **Student** that includes data members for **name**, **age**, and **section**. In the same class, overload the binary subtraction (-) operator (using a member function) to find the **age difference** between two students.

Example:

```
Student s1("Nitin", 30, "A");
```

```
Student s2("Amit", 25, "B");
```

```
Student s3 = s1 - s2;
```

```
s3.ageGap();
```

OR

b. In a banking application, each customer's account details such as **Account Number**, **Customer Name**, and **Account Balance** need to be displayed and entered efficiently.

To simplify input and output operations for the **Account** class, overload the **insertion (<<)** and **extraction (>>)** operators using **friend functions**.

Write a C++ program to demonstrate these overloaded operators for at least **two accounts**.

Q5.

(CO1, CO2)

a. What is an **inline function**? Explain its **advantages**, **disadvantages**, and **restrictions**. Write an example program demonstrating its use.

OR

b. Discuss the **advantages of using static data members** and **static member functions** in a class. Write a short C++ program to show their use in **counting the number of objects created**.