



Central University of Haryana
ODD Semester Term End Examination June 2022
B.Tech. Programmes

Course Code: BT CS 402

Branch: Computer Science & Engineering

Max Time: 3 Hrs.

Course Title: Object Oriented Programming in C++

Max Marks:

Instructions:

Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(7x2 marks=14marks)

- (a) What is an friend function? Give an example to support your answer.
- (b) Define function overriding? Compare it with function overloading?
- (c) Define Data hiding? Explain how it is achieved in C++?
- (d) Write the significance of pure virtual functions in C++?
- (e) What is a function template? Explain its syntax and semantics?
- (f) Differentiate between multilevel and multiple inheritance.
- (g) Write a program to demonstrate the deep copy using a copy constructor.

PART -II

Q. No.2

- a) What is a inline function? Discuss its pros and cons with respective to normal member functions? (7 marks)
- b) What is Function overloading? Write a program to show the alternative solution to the default argument. (7 marks)

OR

Q. No.2

- a) Write a C++ program to generate Fibonacci series using **recursion** with member function.
Example: Output of Fib(8) is 0, 1, 1, 2, 3, 5, 8, 13 (6 marks)
- b) What are the main features of Object-oriented programming? Briefly explain each of them. Also explain its significance. (8 marks)

Q. No.3

- a) What are classes? Create a class with the following data members?
Name of the class: *Employee*
Data members: *name, emp_id, designation, department*
Member functions: *set_details()* and *get_details()* to set and display Employee details respectively? (7 marks)
- b) Create a class InterestCalculator that stores *principal_amount, rate_of_interest, period*. Write the member function to calculate Simple Interest and Compound Interest. (7 marks)

OR

Q. No.3

- a) Create a class BankAccount that contains data members like *name, phone, email, account_number, type_of_account, balance*. Write a program to create two ways to create object based on the rules given below:

- i) Simple Saving Account with ZERO balance (arguments: *name, phone, email, account_number, type_of_account*)
- ii) Premium Saving Account with minimum balance of Rs. 5000 (arguments: *name, phone, email, account_number, type_of_account, balance*) (6 marks)

b) What is a static data member? Write a program to count the instances of a class. (8 marks)

Q. No.4 Create two classes *InternalAwards* & *ExternalAwards* where both the classes derived the properties from the base class *Student*. Write a C++ program illustrating the overloading 'Addition(+)' operator to add both the marks to get the final awards?

Name of the base class: *Student*

Data members: *name, roll_number, branch, year*

Name of the base class: *InternalAwards*

Data members: *sessional_marks, attendance_marks, assignment_marks*

Name of the base class: *ExternalAwards*

Data members: *final_exam_marks*

Note: Addition of Internal awards & External awards must be calculated for the same student. (14 marks)

OR

Q. No.4

a) What is inheritance? How does it enable code reusability, explain with an example? (7 marks)

b) Create classes *Time1* that represent 12 hours clock(AM/PM) and *Time2* that represent 24 hours clock. Write the code to convert the *Time1* object to *Time2* object and vice-versa (*t1=t2;*) (7 marks)

Q. No.5

a) What is a Templates Class? Write a C++ program illustrating Templates Class? (7 marks)

b) Write about IOS format functions with suitable examples? (7 marks)

OR

Q. No.5

a) Discuss formatted and unformatted IO operations in detail. (7 marks)

b) Briefly explain classes for file stream operations in C++? (7 marks)