

End Term (Even) Semester Examination May-June 2025

Name of the Program and semester: BCA II
Name of the Course: **Introduction to Object-Oriented Programming**
Course Code: **TBC-202**
Time: 3 hour

Roll no.....

Maximum Marks: 100

Note:

- (i) All the questions are compulsory.
- (ii) Answer any two sub questions from a, b and c in each main question.
- (iii) Total marks for each question is 20 (twenty).
- (iv) Each sub-question carries 10 marks.

Q1.

(2X10=20 Marks) CO-1, CO-2

- a. Explain all the essential features of OOPS. What is the key difference between modular approach and OOPs approach? Explain using a practical example.
- b.
 - (i) Differentiate between do while and while loops based on syntax.
 - (ii) Explain working of insertion and extraction operators in C++ with the help of suitable example.
- c. What is string data type in C++ and how it is different from char array? Explain various functions and operators associated with string data type.

Q2.

(2X10=20 Marks) CO-2, CO-3

- a. Write short notes on the following:
(i) Data Hiding. (ii) Constructor. (iii) inline function. (iv) This pointer.
- b. What are the uses of static member variables in C++ and What makes it different from instance variables? Write a C++ program to illustrate the static member variable and static member function.
- c. How does compile time polymorphism different from run time polymorphism. Explain with a suitable example.

(2X10=20 Marks) CO-3, CO-4

Q3.

- a. Create a class **BIKE** with four members variables (**Make, Model, Colour, EngineCC**) and member functions **void input()** and **void output()**.
Create an object of **BIKE** class and display all the details of object using `std::cout` by overloading "<<" operator.
(Example: `cout<<b1;` where b1 is object of **BIKE** class).
- b. How visibility mode affects the access specifier of derived member (function/data) from base class to derived class. Explain with a suitable C++ code and proper diagram/table.
- c. What is type conversion in C++? Write a program in C++ to create two classes **Euro** and **INR** with

member variable `Float E` and `Float R` respectively. Initialize the value of `R` and `E` using parameterized constructors. Now convert object of Rupees class to object of Euro class. Assume necessary assumptions. (Euro 1 = Rs. 97).

Q4.

(2X10=20 Marks) CO-3, CO-4

- a. Write short notes on the following:
 - (i) Data Ambiguity.
 - (ii) Abstract class.
 - (iii) Pure Virtual Function.
 - (iv) Generic function.
- b. How does inheritance affect constructors? Elaborate with a suitable example.
- c. Why do we use friend function and friend class in C++? Write a program to create two class **A** and **B** with private member variable `int a` and `int b` respectively. Input the values of `a` and `b` by creating objects of these classes **A** `ob1` and **B** `ob2`. Now compare and swap the values of these variables if `ob1.a > ob2.b`.

Q5.

(2X10=20 Marks) CO-5

- a. Write a C++ program to create a file (`Movie.dat`) which stores the information Title, Release-Year, Earning and perform following operations:
 1. Insert details of a new movie in the file.
 2. Display details of all the movies stored in the file.
 3. Display title of all the movie having earning > Rs 500 Crore.
- b. Write a C++ program to calculate the percentage of a student by taking marks obtained (**MO**) and maximum mark (**MM**) from the user. Throw two different exceptions if:-
 - (i) The marks obtained are negative.
 - (ii) The marks obtained are greater than maximum marks.
- c. What are the functions template and class template in C++? Write a program to create a template class **Array** containing a generic array `a[5]`. Create two member functions `input()` to input 5 elements in this array of *integer/character/float type* and `sort()` to sort and display the array.