Name: Enrolment No:	

UPES

End Semester Examination, May 2024

Programme Name : B.Sc **Semester : II**
Course Name : OOPs Using C++ **Time : 03 hrs**
Course Code : CSEG 1038 **Max. Marks: 100**
Nos. of page(s) : 2
Instructions: Answer all the questions.

SECTION A

S. No.		Marks	CO
Q 1	Compare and contrast the functionality of the while and do-while loop. Provide program of each.	**4**	**1**
Q 2	Write a program to create an array of objects of size 4, assuming that class contains one integer and one double data member. Input and display the values of array of objects.	**4**	**2**
Q 3	Write a program to input and print an array of size 5, allocating memory to the array using the **new** operator. Ensure the program is free from dangling pointers.	**4**	**3**
Q 4	Differentiate between break and continue with suitable examples.	**4**	**2**
Q 5	Explain the concept of class template with the help of example.	**4**	**4**

SECTION B

Q 6	Answer the following questions: a. Explain the concept of inline functions in C++. Discuss the advantages and disadvantages of using inline functions. Mention a code snippet to support your answer. b. Comment on the statement "scope resolution operator is used to resolve the ambiguity of local and global variable". Mention a program to support your answer.	**10**	**1**
Q 7	Write a note on the below, also mention code snippet to support your answer. a. Copy constructor. b. Friend function. c. Parameterized constructor. d. Static member function.	**10**	**2**
Q 8	Explain the concept of inheritance and provide separate programs to illustrate Multiple, Multi-level, and Hierarchical inheritance.	**10**	**3**

Q 9	Discuss the syntax and usage of function templates with multiple parameters. Provide an example of a function template for finding the sum of two numbers of different data types. OR Implement a class template called **Pair** that represents a pair of elements of different types. The class should have the following functionalities: 1. A constructor that initializes the pair with two values of different types. 2. Methods to get the first and second elements of the pair. 3. Test your Pair class template by creating instances of it with different data types for the first and second elements and performing addition operation.	**10**	**4**
SECTION C			
Q 10	Answer the following : a. Write a program to overload post increment operator. b. Explain the concept of run-time polymorphism with the help of program. c. Explain the concept of function overloading with the help of program. d. Write a program to demonstrate the concept of accessing data members of the class using pointer.	**20**	**3**
Q 11	Explain the concept of exception handling. Write a C++ program that repeatedly prompts the user to input integer number and count all the entered numbers, except when the user enters the number 7. In that case, the program should display an error message "wrong input" and total number of integers entered by the user, but continues to prompt for input and keep counting the entered numbers. Write a C++ code snippet to accomplish this task using exception handling to detect and handle the input of 7. OR Discuss the throwing and catching mechanism in exception handling, including how to throw exceptions using the **throw** keyword and catch exceptions using **try** and **catch** blocks. Additionally, explain the concept of rethrowing an exception with the help of a program. Write a program that calculates the factorial of a integer number using exception handling to handle invalid input (negative numbers)	**20**	**4**