UPES
End Semester Examination, May 2025

Course: OOPs using C++
Semester: II
Program: B. Sc. Computer Science   **Time: 03 hrs.**
Course Code: CSEG1045   **Max. Marks: 100**

Instructions:

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Explain the concept of inline functions in C++. How do inline functions help in improving performance?	4	CO2
Q 2	What is the purpose of the scope resolution operator (::) in C++? Show its usage with an example.	4	CO1
Q 3	Explain the concept of static member functions in C++. How are they different from regular member functions?	4	CO2
Q 4	What is a friend function in C++? Why is it not considered a member of the class?	4	CO1

Q 5	a) Fill in the blank to complete the parameterized constructor in the following C++ class:
	class Book {
	  string title;
	public:
	  _____
	  {
	    title = t;
	  }
	};
	
	b) Fill in the blank to correctly define a copy constructor for the following class:
	class Person {
	  int age;
	public:
	  Person(int a) {
	    age = a;
	  }
	
	  _____
	  {
	    age = p.age;
	  }
	};
		4	CO2

SECTION B
(4Qx10M= 40 Marks)

Q 6	Describe the concept of virtual functions with an example. Why are they important in OOP?	10	CO2

Q 7	Write a C++ program using variadic templates to print an arbitrary number of arguments passed to a function. Demonstrate its output with at least two different calls.	10	CO3
Q 8	Analyze the role of synchronization in multithreaded C++ programs: a) What is race condition and how can it affect program behavior? b) In what scenario would std::unique_lock be preferred over std::lock_guard?	10	CO3
Q 9	Explain the concept of exception handling in C++ and the need for it in real-world applications. Then, demonstrate exception handling in C++ by writing a program that performs division of two numbers and throws an exception if the denominator is zero. Ensure that your program includes try, catch, and throw statements and handles the exception gracefully.	10	CO3
SECTION-C **(2Qx20M=40 Marks)**			
Q 10	Analyze the advantages and limitations of using file streams (ifstream, ofstream, fstream) for text file operations in C++. In which situations are using fstream more flexible than using ifstream or ofstream individually? Support your analysis with examples.	20	CO4
Q 11	Analyze the advantages and limitations of using template specialization over function overloading. In which situations do template specialization offer better design flexibility? Support your analysis with examples.	20	CO4