UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2021

Course: Object Oriented Programming   **Semester:** I
Program: B.Tech APE US   **Time   : 03 hrs.**
Course Code: CSEG1008   **Max. Marks: 100**

Instructions: 1. Be specific while answering the questions.
             2. Justify your answers with the help of examples and codes.
             3. Internal choices are provided in Question 9 and 10

SECTION A

S. No.		Marks	CO
Q 1	Write the output of the given code- ```cpp\n#include <iostream>\nusing namespace std;\nint main()\n{\n int a = 10;\n int b = 12;\n int c = a || --b;\n int d = a|--b;\n int e = a-- & --b;\n cout<<a <<" " <<b <<" " <<c <<" " <<d <<" " <<e;\n return 0;\n}\n```	4	CO1

Q 2	The function is declared to take three arguments. A program calls this function and passes only two arguments. What is the result?
	   a) Compilation fails
	   b) The third argument is given the value void
	   c) The third argument is given the value zero
	   d) An exception occurs when the method attempts to access the third argument
		4	CO1

Q 3	How can you include encapsulation in your class design?
	   a) Define instance variable as private member
	   b) Define public methods to access and modify the instance variable.
	   c) Define some of the instance variable as public members
	   d) All of the above
		4	CO2

Q 4	Which of the following statement declares a constant field in C++?
	   a) const int x = 10;
	   b) static int x = 10;
	   c) final static int x = 10;
	   d) volatile int x =10;
		4	CO1

Q 5	Write the output of the given program-	4	CO1

```cpp
#include <iostream>
using namespace std;

void fun()
{
    static int count = 2;
    cout << count << " ";
    count++;
}

int main()
{
    for (int i=1; i<5; i++)
    fun();
    return 0;
}
```

SECTION B			
Q 6	Explain Virtual Functions and the concept of Runtime Polymorphism in C++ with a code example.	**10**	**CO4**
Q 7	Justify how function overloading is different from operator overloading using code example.	**10**	**CO3**
Q 8	Describe the role of inline functions in reducing the overhead of calling a function.	**10**	**CO3**
Q 9	How can we access private data member of a class in another class, explain the way of accessing the private data with example? OR Design a structure 'product' to store the details of the product purchased like product id, price per unit, number of quantities purchased, and amount spent. Get the id, price per unit, and number of quantities of the product purchased from the user. Calculate the amount spent on the product and then display all the details of the procured product.	**10**	**CO2**
SECTION-C			
Q 10	Design a Class QRoots, which finds roots of a quadratic equation using suitable functions and data members. Monitor and handle your code for suitable exceptions. OR Design a class employee of an organization. An employee has a name, empid, and salary. Write a constructor with parameters (name, empid, and salary) and methods to return name and salary. Additionally, write a method increaseSalary that raises the employee's salary by a certain user specified percentage. Derive a subclass Manager from employee. Add an instance variable named department to the manager class. Supply a test program that uses theses classes and methods.	**20**	**CO4**

Q 11	a) Write a C++ Program to accept 10 numbers in an array and print the sum of these numbers.
	b) Print the pattern given below
	
	       *
	     * * *
	   * * * * *
	  * * * * * * *
	 * * * * * * * * *
	
	   Note- There are **no** space in **between** the stars (*)
		10+10	**CO2**