Name: Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Supplementary Examination, Dec. 2023

Course : B.Tech- CSE **Semester : 1**
Program : Principles of Programming Languages **Time : 03 hrs.**
Course Code : CSEG 1009 **Max. Marks: 100**

Instructions: Attempt all the questions.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Differentiate between the functionality of linker and loader through an appropriate block diagram.	**4**	**CO1**
Q 2	State the reason why the use of goto construct is discouraged in C-programming through a suitable code snippet.	**4**	**CO2**
Q 3	Concatenate two strings entered by the user without using any string function.	**4**	**CO3**
Q 4	Compare between the structure and class with the help suitable examples.	**4**	**CO4**
Q 5	Explain how the data security is implemented through the private visibility mode in a class specification.	**4**	**CO4**
	SECTION B **(4Qx10M= 40 Marks)**		
Q 6	Write an algorithm to compute the factorial of a number **recursively**. Also, draw a flowchart for the same. **(5 + 5 = 10 Marks)**	**10**	**CO1**
Q 7	Distinguish between pointer and reference variables. Write a program to compute $\mathbf{a^b}$ (where **a** and **b** are the two integers entered by user) demonstrating the ***call by value*** and ***call by reference*** methodologies. **(2+4+4 = 10 Marks)**	**10**	**CO3**
Q 8	Write a menu-driven program in C that performs the following computations over a pair of complex numbers (implemented as structure variables): a) Addition of complex numbers b) Subtraction of complex numbers c) Multiplication of complex numbers d) Conjugate of a complex numbers **(2.5 x 4 = 10 Marks)**	**10**	**CO3**
Q 9	Differentiate between the homogeneous and heterogeneous data types. Explain the working with 1-D and 2-D arrays with suitable code snippets. **(2+4+4=10 Marks)**	**10**	**CO2**

	OR Write a C program that accepts two 2-D integer arrays with the dimensions provided by the user and multiplies them.		
	SECTION-C **(2Qx20M=40 Marks)**		
Q 10	Predict the outcomes for the following code snippets if you find them error free. In case you observe any error, report your observation explicitly and the way to rectify the error. Assume all the header files are already included. **(4 x 5 = 20 Marks)** a) ``` int main() { int i = 1024; for (; i; i >>= 2) printf("School of Computer Science\n"); return 0; } ``` b) ``` int main( ) { int i; if (printf("UPES")) i = 3; else i = 5; printf("%d\n", i); return 0; } ``` c) ``` int main() { int i = 4, j = 8; while (i>0 & j>0) { i--; j--; printf("%d %d\n", i<<1, j<<1); } return 0; } ``` d) ``` void main() { int a=10; float b=10.8; char c='U'; void *ptr; iptr=&b; ptr=&a; printf("Integer Value=\t%d\n",*ptr); ```		**CO2**

	ptr=&b; printf("Float Value=\t%f\n",*ptr); ptr=&c; printf("Character Value=\t%c\n",*ptr); }		
Q 11	Explain the following concepts using suitable examples: a) Exception Handling b) Visibility modes in C++ c) Operator Overloading d) Constructor and Destructors **(4 x 5 = 20 Marks)** **OR** Distinguish between the following concepts: a) Static Polymorphism vs. Dynamic Polymorphism b) Function Overloading vs. Function Overriding c) Hierarchical Inheritance vs. Multilevel Inheritance d) Try vs. Catch Blocks **(4 x 5 = 20 Marks)**	**20**	**CO4**