Name: **Enrolment No:**	UPES UNIVERSITY OF TOMORROW

UPES

End Semester Examination, Dec 2024

Course: Computational Techniques in Petroleum Engineering **Semester: V**

Program: Btech APE_UP **Time : 03 hrs.**

Course Code: PEAU3045P **Max. Marks: 100**

Instructions: All questions are mandatory.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Define significant figure.	**4**	**CO1**
Q 2	Define "Least count"	**4**	**CO1**
Q 3	Differentiate between approximate error and true error.	**4**	**CO2**
Q 4	Distinguish between "accuracy" and "precision".	**4**	**CO2**
Q 5	Highlight the difference between first order and second order of approximation in Taylor series.	**4**	**CO2**
	SECTION B **(4Qx10M= 40 Marks)**		
Q 6	Compare and contrast the differences between the Open method and Bracket method of obtaining roots.	**10**	**CO3**
Q 7	Solve the given set of Linear equation using Cramers Rule $x + y + z = 6$ $y + 3z = 11$ $x + z = 2y$ or $x - 2y + z = 0$	**10**	**CO4**
Q 8	For the given augmented matrix, calculate the upper triangular matrix. $\left[\begin{array}{ccc\|c} -1 & 4 & -2 & -15 \\ -4 & 6 & 1 & -5 \\ -6 & -6 & -2 & -10 \end{array}\right]$	**10**	**CO4**
Q 9	Explain your understanding about the roots of a function. Is it different or similar to the solutions obtained from solving an equation? Support your answer by detailed reasoning.	**10**	**CO4**
	SECTION-C (Attempt only 2) **(2Qx20M=40 Marks)**		

Q 10	Calculate the root of the given equation using the Bisection method up to the 10th iteration. The results should be presented step-by-step, with at least the first 5 iterations shown, and a table summarizing the findings throughout the process. $f(x) = 2x^3 - 2x - 5$	**20**	**CO3**
Q 11	Estimate the root of the given equation using Newton Raphson method. The results should be presented step-by-step, with at least the first 5 iterations (or same iteration values) shown, and a table summarizing the findings throughout the process $f(x) = 2x^3 - 2x - 5$	**20**	**CO4**
Q 12	Evaluate the solution of the system of simultaneous linear equation of 3 variables using Gauss Jordan Method. $2x + y + 2z = 10$ $x + 2y + z = 8$ $3x + y - z = 2$	**20**	**CO4**