Name: **Enrolment No:**	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2019

Course: M. Tech Chemical Engineering (Spl. In Process Design) **Semester: I**
Program: Chemical Engineering Computing **Time: 03 hrs.**
Course Code: CHPD7002 **Max. Marks: 100**

Instructions:
1. **OPEN BOOKS AND OPEN NOTES**
2. **Clearly state your assumptions wherever necessary**

S. No.	Attempt all questions	Marks	CO
Q 1	Starting with $x^{(1)} = 0.65$, obtain first five iterates using Newton Raphson technique on $$F(x) = x - \frac{1}{3}e^{x} = 0$$	**30**	**CO 3 & CO 4**
Q 2	Obtain the stability condition for Hermit Implicit technique. Data: $\alpha_0 = \alpha_2 = 0.5$ $\alpha_1 = \alpha_3 = \alpha_4 = \alpha_5 = \alpha_6 = 0$ $\beta_0 = -0.25$ $\beta_0 = -\beta_2$ $\beta_1 = \beta_3 = \beta_4 = \beta_5 = \beta_5 = 0$	**30**	**CO 3 & CO 4**
Q 3	Consider 1D steady state heat conduction in an infinite slab of thickness 3 cm, as given below, with *k*, thermal conductivity of 0.0025 W/mK. The initial temperature at one surface is 100°C and the ambient temperature at the other end is 25°C. Solve the equation using Finite Difference Method and SOR. Assume N=4. $$\frac{d}{dx}\left(k\frac{dT}{dx}\right) = 0$$ @ x = 0; T = 100°C and @ x = 3 cm; T = 25°C.	**40**	**CO 4 & CO 5**