Assignment 12. Euler Forward, Predictor-Corrector Marks 10

Posted on 22.10.2025 @ 2:30 pm and due on 22.10.2025 @ 6:00 pm

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1. Use Forward (explicit) Euler and Predictor-Corrector methods to solve and the following differential equations and compare with analytical form over range $x \in [0, 2]$ and $x \in [0, \pi/5]$ for the first and the second differential equations respectively. Use step size 0.1 in both the cases.

$$\frac{dy}{dx} = y - x^2 \qquad \text{with } y(0) = 0 \quad \rightarrow \qquad y(x) = x^2 + 2x + 2 - 2e^x$$

$$\frac{dy}{dx} = (x + y)^2 \qquad \text{with } y(0) = 1 \quad \rightarrow \qquad \tan^{-1}(x + y) = x + \frac{\pi}{4}$$