Lecture 18 Worksheet (ECON211), AY 2025-26 [Date: 04 Sep 2025]

1. A successful startup named *Dunzo* ran an ad-campaign for 4 days. The profit on day 0 was ₹100 and the profit on day 4 was ₹500. The CEO's data team estimated that the profit as a function of time to be $\pi = 25t^2 + 100$. Calculate the average growth rate of profit. How many days would it take for the profit to grow at the average growth rate?

2. Let $f(x) = \begin{cases} x^2 - 1 & -3 \leq x < 0 \\ 1 - x & 0 \leq x \leq 3 \end{cases}$

Find the absolute extrema of the function.

3. Calculate the following integrals: (i) $\int \frac{x^4 - x^2 + 1}{x^2} dx$ (ii) $\int (x^{4/5} + 1) dx$ (iii) $\int \left(e^{\frac{4}{3}x} - \frac{2}{x} \right) dx$

4. The demand for *Muscoth halwa* is $q = 60 - 2p$ and the supply is $q = p$. Calculate the consumer and producer surplus. In a bid to support the industry, the Tamil Nadu government announces a price floor of ₹25. What happens to the consumer and producer surplus?