

UNIT-2

(Lecture-3)

Initial and Final value theorems

Initial Value Theorem

$$\lim_{t \rightarrow 0} [f(t)] = \lim_{s \rightarrow \infty} sF(s)$$

Final Value Theorem

$$\lim_{t \rightarrow \infty} [f(t)] = \lim_{s \rightarrow 0} sF(s)$$

Apply Initial- and Final-Value Theorems to this Example

$$Y(s) = \frac{2}{s(s+2)(s+4)}$$

$$\lim_{t \rightarrow \infty} [f(t)] = \frac{2(0)}{(0)(0+2)(0+4)} = \frac{1}{4}$$

$$\lim_{t \rightarrow 0} [f(t)] = \frac{2(\infty)}{(\infty)(\infty+2)(\infty+4)} = 0$$

- Laplace transform of the function.
- Apply final-value theorem
- Apply initial-value theorem