

ECE 365 Q2 s/s 00

NAME:

Honor Code:

KEY

Solve for $x(t)$ assuming all Initial conditions are 0.

$$\frac{d^2 x(t)}{dt^2} + 6 \frac{dx(t)}{dt} + 5 x(t) = 10 u(t)$$

$$X(s) [s^2 + 6s + 5] = \frac{10}{s}$$

$$X(s) = \frac{10}{s(s+1)(s+5)}$$

$$= \frac{2}{s} + \frac{-2.5}{s+1} + \frac{0.5}{s+5}$$

$$x(t) = [2 - 2.5 e^{-t} + 0.5 e^{-5t}] u(t)$$