Classwork 10: Fall 2024
CPE381

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September 25, 2024

Total: 10 points
Some points to remember:

1 System Response.

5 points each.

1. Solve the second-order linear differential equation

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

   with initial condition $y(0^-) = 2$, and $y'(0^-) = 1$, and $x(t) = e^{-4t}u(t)$.

   The output $y(t)$ is called the **complete response**.

2. By setting the initial condition to zero, we get the zero state response (ZSR). By assuming only the initial condition, and setting input $x(t)$ to zero, we get the zero input response (ZIR).

   For the previous question, assume the initial condition to be zero, and calculate the output. It will be your zero state response (ZSR), y_{zsr}. Zero input response (ZIR) can be $y_{zir} = y(t) - y_{zsr}$.