Assignment 2: Systems with delay

(You can answer with either English or Indonesian.)

1. (**Weight: 25%**) Consider a closed-loop system with plant transfer function $H(s) = \frac{2}{s+1}$ with delay 10s between the plant and summing point (use step signal as set point). Draw the block diagram, and analyze the time-response of the output with and without delay.

2. (**15%**) Analyze the Bode plot of the system in Problem 1 with and without delay.

3. (**15%**) Design and apply a Smith predictor to the system in Problem 1. Analyze the affected time response and the Bode plot.

4. (**10%**) Explain two examples of delays that are not related to networked systems.

5. (**10%**) Explain why in the networked systems the delay is often assumed not to be more than the sampling period. What will happen if this assumption is not satisfied?

6. (**25%**) Find a paper that discusses a networked control system with uncertain delay. Explain the content in about 300 words.