OWL UAS; Prof. Meier; written exam DSS; 2018-02-14 (Master)

Results

Problem 1

1F, 2A, 3G, 4B, 5H, 6C, 7D, 8E

Problem 2

1) linear, time variant, causal, no memory

2) not linear, time variant, not causal, memory

3) linear, time invariant, causal, memory

Problem 3

$$\textbf{???} = -\frac{1}{2} \cdot \sin\left(2\pi \cdot (a-b) \cdot t\right)$$

Problem 4

$y(t \leq -2) = 0$; $y(-1) = -4$; $y(0) = 0$; $y(1) = 4$; $y(t \geq 2) = 0$

Problem 5

5.1 $H(s) = \dfrac{1}{s \cdot (s-2) \cdot (s+2)}$

5.2 not stable

5.3 $h(t) = \dfrac{1}{8} \cdot \left(-2 + \mathrm{e}^{2t} + \mathrm{e}^{-2t}\right) \cdot u(t)$

Problem 6

6.1 ROC: $|z| > 4$

6.2 $x[n] = \dfrac{3}{8} \cdot \delta[n] - \dfrac{1}{4} \cdot (-1)^n \cdot u[n] - \dfrac{1}{8} \cdot (-4)^n \cdot u[n]$

Problem 7

7.1 $H(z) = \dfrac{1}{3 - 4 \cdot z^{-1} + z^{-2}}$

7.2 no

7.3 ...

7.4 $K = 1 \rightarrow p_{1/2} = 0.5$