

## Answers to written exam 17/8 2018

1. 12.5 mW of power is consumed in  $R_3$
2.  $V_{TH} = 4 \text{ V}$ ,  $R_{TH} = 1.33 \text{ k}\Omega$
3.  $I_o = 2.5 \text{ mA}$
4. A)  $V_{out} = -\frac{R_2}{R_1} V_{in}$     B)  $-3.75 < V_{in} < 3.75 \text{ V}$
5. A)  $\tau_{up} = 5.5 \text{ }\mu\text{s}$     B)  $\tau_{down} = 30 \text{ }\mu\text{s}$
6. A)  $V_L(t) = 100e^{-\frac{t}{25\text{ }\mu\text{s}}} \text{ V}$     B)  $25 \text{ }\mu\text{J}$
7. A)  $Z = j\omega L + \frac{R}{1+j\omega RC}$     B)  $i(t) = 2\cos(\omega t - 45) \text{ mA}$
8. A)  $\frac{\hat{V}_{out}}{\hat{V}_{in}} = \frac{1}{1+j\omega\frac{L}{R}}$   
B)  $\omega \rightarrow 0$  then  $\frac{\hat{V}_{out}}{\hat{V}_{in}} \rightarrow 1$ ,  $\omega \rightarrow \infty$  then  $\frac{\hat{V}_{out}}{\hat{V}_{in}} \rightarrow 0$   
This is an low pass filter