1. (15%, 3% each) Find $R_{eq}$, $L_{eq}$, $C_{eq}$, or $Z_{eq}$ for each circuit.

(a) $R_{eq} = \phantom{0}10 \Omega$

(b) $C_{eq} = \phantom{0}3 \mu F$

(c) $L_{eq} = \phantom{0}4 \text{H}$

(d) $\omega = 10,000 \text{ rad/s}$
   $Z_{eq} = \phantom{0}1 \text{ mH}$

(e) $Z_{eq} = \phantom{0}2 \text{ ohms}$
2. (15%) Find the inductor current phasor, $I_L$, for the circuit below.
3. (15%) Determine the average power absorbed by each element in the circuit below.

\[
P_{12\ V} = \quad P_{2\ A} = \quad P_{L} = \quad P_{C} = \quad P_{R} =
\]
4. (16%, 8% each)

(a) (8%) Find $V_o(t)$ for all $t$.

$$V_o(t) = \begin{cases} 
    t & t < 0 \\
    t & t > 0
\end{cases}$$
(b) (8%) Find $I_o(t)$ for all $t$.

$$I_o(t) = \begin{cases} \quad & t < 0 \\ \quad & t > 0 \end{cases}$$
5. (9%, 3% each) Find $V_{out}(t)$ for each of the following $V_{in}(t)$. The capacitor is initially discharged.

\[ V_{in}(t) \quad 1 \mu F \quad 1 \text{k}\Omega \quad V_{o}(t) \]

(a) $V_{in}(t) = (1 \text{ v}) u(t)$. 

6. (15%, 5% each) Find the Norton and Thevenin equivalent circuits for each of the following.

(a) 10 mA

(b)
7. (5%) Part of a SPICE input file is given below. Draw the circuit. Number the circuit nodes and show the component values.

```
R1 1 0 10K
R2 2 0 500
ISRC 2 1 DC 2
L 2 3 3M
C 4 0 2U
VSRC 3 4 DC 10
```
8. (10%) The voltage across a 1 \( \mu \text{F} \) capacitor is shown below. Find the capacitor current, power absorbed, energy stored, and charged stored. Follow the passive sign convention. Carefully label all axes.
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