

Answers to April 29, 2015 Final Exam

1. MATLAB commands:

$$\gg A = [(1/2000 + 1/3000 + 1/1000) (-1/1000);$$

$$(-1/1000 - 0.03) (1/1000 + 1/8000)]$$

$$\gg d = [12/2000; 0]$$

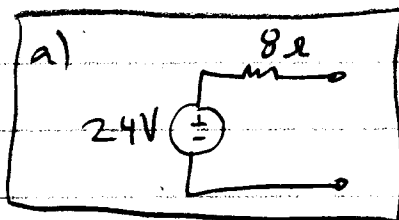
$$\gg V = A \backslash d$$

$$\gg V_0 = V(2)$$

$$V_0 = -6.428$$

2. $V_0 = 2 - 6 + 2 = -2V$

3.



b) $C_T = 40 \mu F$

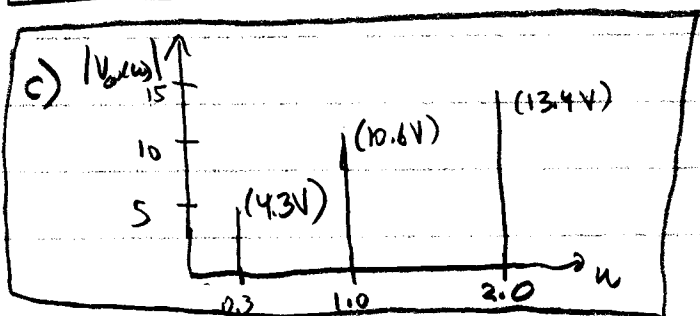
c) $v_c(t) = 24 e^{-t/1.8 \times 10^{-3}}$

d) $v_c(4ms) = 2.6V$

4. a) $i_o(t) = 0.2121 \cos(8000t + 45^\circ)$

b) $P = \text{Re}(0.3182 e^{-j45^\circ}) = 0.225W$

5. a) High-pass filter b) $R_1 = 100 k\Omega$ $R_2 = 500 k\Omega$



(Extra Credit)

$$\omega = \frac{1}{\sqrt{LC}}$$