

**Answers to EEE210 Midterm AY2016-2017**

1. (a) Assume D is reverse biased at  $t = 0$  and show that  $V_o(0) = 3 \text{ V} = -V_D(0)$ . This confirms that D is reverse biased.  
(b)  $t_p = 3 \ln(6/5) \text{ ms} = 0.546965 \text{ ms}$ .

2.

$$v_o(t) = \frac{g_m (R_2 \parallel R_3) v_i(t)}{1 + g_m (R_2 \parallel R_3)}$$

3.

$$\begin{aligned} I_D &= 9.654 \text{ mA} \\ V_{GS} &= 2.359 \text{ V} \\ V_{DS} &= 1.877 \text{ V} \end{aligned}$$

4. (a) Refer to notes.  
(b)  $R_L \geq 242.12 \Omega$   
(c)  $R_P = 194.118 \Omega$
5. (a)  $R = 3.6 \text{ k}\Omega$ ,  $R_{\text{dynamic}} = 50 \Omega$ .  
(b)  $V_o(t) = 1.4 \text{ V} + 5.4054 \sin((100 \pi \text{ rad/s}) t) \text{ mV}$ .