Answers to EEE210 First Midterm AY2018-2019

1. (a) If $D_1 \equiv$ forward biased and $D_2 \equiv$ forward biased then $V_{out} = V_{in}$ and $V_{in} > 80$ V. The smallest value of V_{in} is 80 V.

   (b) $V_{out} = 80$ V ($D_1 \equiv$ forward biased and $D_2 \equiv$ reverse biased).

2. (a) $V_S = 2.81235$ V

   (b) $V_S = 2.85$ V

3. $v_o(0^+) = 0$ V $\Rightarrow V_D(0^+) = -2$ V $\Rightarrow D$ is initially reverse biased. D switches to forward biased at time $t_p = 24$ ms. Finally:

$$v_o(t) = \begin{cases} 5 - 5\,\mathrm{e}^{-t/(47\text{ ms})}\text{ V} & \text{if } 0 \le t \le t_p \\ 2\text{ V} & \text{if } t_p \le t \end{cases}$$

4. (a) 43.97 mA $< I_R(t) <$ 58.68 mA.

   (b) $R_L \ge 116\ \Omega$.