

Homework 3 Part B Solutions

Posted Tuesday, October 4th, 2016

Each homework problem is worth 10 points unless otherwise stated.

2.50

(a) (i) $v_I = 5 \text{ V}$, D_1 and D_2 on

$$\frac{5 - (v_O + 0.6)}{5} + \frac{5 - v_O}{5} = \frac{v_O}{0.5} + \frac{v_O - 0.6}{0.5}$$

$$0.88 + 1.0 + 1.2 = v_O(0.20 + 0.20 + 2.0 + 2.0) \Rightarrow v_O = 0.7 \text{ V}$$

(ii) $v_I = -5 \text{ V}$

$$v_O = \left(\frac{0.5}{0.5 + 5} \right) v_I = -0.455 \text{ V}$$

2.64

$$I = \frac{10 - 1.5 - 0.2}{R + 10} = 12 \text{ mA} = 0.012$$

$$R + 10 = \frac{8.3}{0.012} = 691.7 \Omega$$

$$\underline{R = 681.7 \Omega}$$