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HW#3 ENGR 065-3

- 2-c) Find the equivalent resistance seen by the voltage source. What is the power provided by this source?

$$\frac{1}{R_1} = \frac{1}{12} + \frac{1}{4} + \frac{1}{20} + \frac{1}{15} \Rightarrow \frac{1}{R_1} = 5 \Rightarrow R_1 = 5\Omega$$

$$\frac{1}{R_2} = \frac{1}{51} + \frac{1}{18} = 69\Omega \Rightarrow R_2 = 69\Omega$$

$$R_3 = 6 + 14 = 20\Omega$$

$$R_T = 69 + 11 + 10 = 90\Omega$$

$$51\Omega \parallel 14\Omega = \frac{51(14)}{51+14} = 11\Omega$$

$$\boxed{R_T = 90\Omega}$$

3-i) a) $V_p = \frac{(50V)(R_p \parallel 2)}{R_p \cdot 112 + 1} = \frac{(50V)(2R_p)}{2R_p + R_p + 2} \Rightarrow 25V = \frac{100R_p}{3R_p + 2}$

$$3R_p + 2 = 4R_p \Rightarrow 2 = 1R_p \Rightarrow \boxed{R_p = 1k\Omega}$$

b) $25 = \frac{50(2)}{3 + R_s} \Rightarrow R_s + 3 = 4 \Rightarrow \boxed{R_s = 1}$

c) It would be circuit a) because it is in parallel

4: $I = (9\Omega)(1mA) = 9mV$

$$R = \frac{V}{I} = \frac{9mV}{10mA} = \boxed{0.9\Omega = R}$$