EDES 301 Assignment 1

1a Red, red, black, gold

1b Orange, orange, brown, gold

1c Brown, black, red, gold

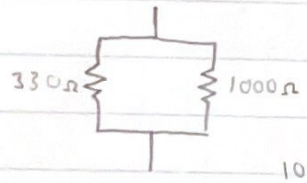
1d Red, red, red, gold

1e Yellow, purple, red, gold

1f Brown, black, orange, gold

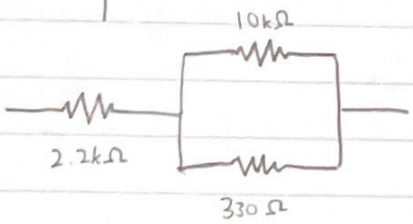
1g Brown, black, ~~yellow~~, gold

2a



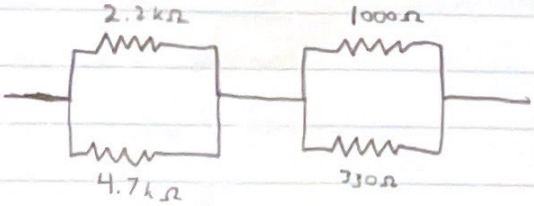
$\approx 248.12\ \Omega$

2b



$\approx 2519.46\ \Omega$

2c



$\approx 1746.67\ \Omega$

3 Max: $\frac{1}{\frac{1}{330-1.05} + \frac{1}{1000-1.05}} \approx 260.5\ \Omega$

Min: $\frac{1}{\frac{1}{330+0.05} + \frac{1}{1000+0.05}} \approx 235.7\ \Omega$

4 ▷ Max temp : 100°C

Max forward current @ 100°C : 10mA

Forward voltage @ 10mA : ~2V

$V = IR$

$3.3 = V_R + V_L$ $\quad 1.3 = 0.01(R_1 \cdot 1.05)$

$3.3 = 1.3 + 2$ $\quad R_1 = \frac{130}{1.05}$ $\quad R_1 \approx \boxed{124\Omega}$

5 ▷ 5a) $V_{out} \approx 1.242 \cdot \left(1 + \frac{470,000}{280,000}\right)$

$\approx \boxed{3.3V}$

5b) $V_{MAX} \approx 1.242 \cdot \left(1 + \frac{474,700}{277,200}\right)$

$\approx \boxed{3.369V}$

$V_{MIN} \approx 1.242 \cdot \left(1 + \frac{465,300}{282,800}\right)$

$\approx \boxed{3.286V}$

5c) 2% Accuracy

5d) About 65% efficiency $\quad \frac{V_{out} \cdot I_{out}}{V_{IN}(I_{out} + I_q)}$

$\frac{3.3(0.5)}{5(0.5 + 0.008)}$

≈ 0.65