

## 2024A9

## CIRCUITS, RESISTANCE

Level 1: Figure 4:

$$\frac{1}{R_{eq}} = \left( \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \right)$$

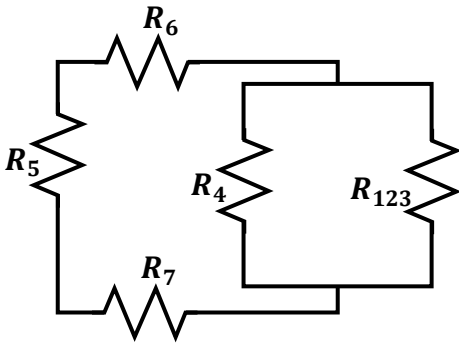
$$\frac{1}{R_{eq}} = \left( \frac{1}{150 \Omega} + \frac{1}{60 \Omega} + \frac{1}{200 \Omega} \right)$$

$$\frac{1}{R_{eq}} = 0.02833 \Omega$$

$$R_{eq} = \frac{1}{0.02833 \Omega}$$

$$R_{eq} = 35.3 \Omega$$

Level 2:



$$R_{12} = \left( \frac{1}{R_1} + \frac{1}{R_2} \right)^{-1}$$

$$R_{12} = \left( \frac{1}{200 \Omega} + \frac{1}{350 \Omega} \right)^{-1}$$

$$R_{12} = 127.27 \Omega$$

$$R_{123} = R_{12} + R_3$$

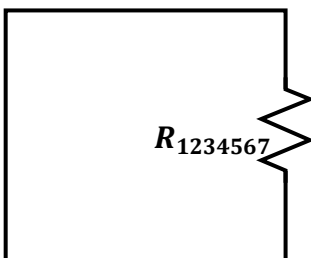
$$R_{123} = 127.27 \Omega + 50 \Omega$$

$$R_{123} = 177.27 \Omega$$

$$R_{1234} = \left( \frac{1}{R_{123}} + \frac{1}{R_4} \right)^{-1}$$

$$R_{1234} = \left( \frac{1}{177.27 \Omega} + \frac{1}{500 \Omega} \right)^{-1}$$

$$R_{1234} = 130.87 \Omega$$



$$R_{1234567} = R_{1234} + R_5 + R_6 + R_7$$

$$R_{1234567} = 130.87 \Omega + 180 \Omega + 100 \Omega + 220 \Omega$$

$$R_{1234567} = 630.87 \Omega$$

$$R_{eq} = R_{1234567} = 630.87 \Omega$$

Figure 5:

$$R_{eq} = R_1 + R_2 + R_3 + R_4 + R_5$$

$$R_{eq} = 150 \Omega + 60 \Omega + 200 \Omega + 120 \Omega + 100 \Omega$$

$$R_{eq} = 630 \Omega$$

