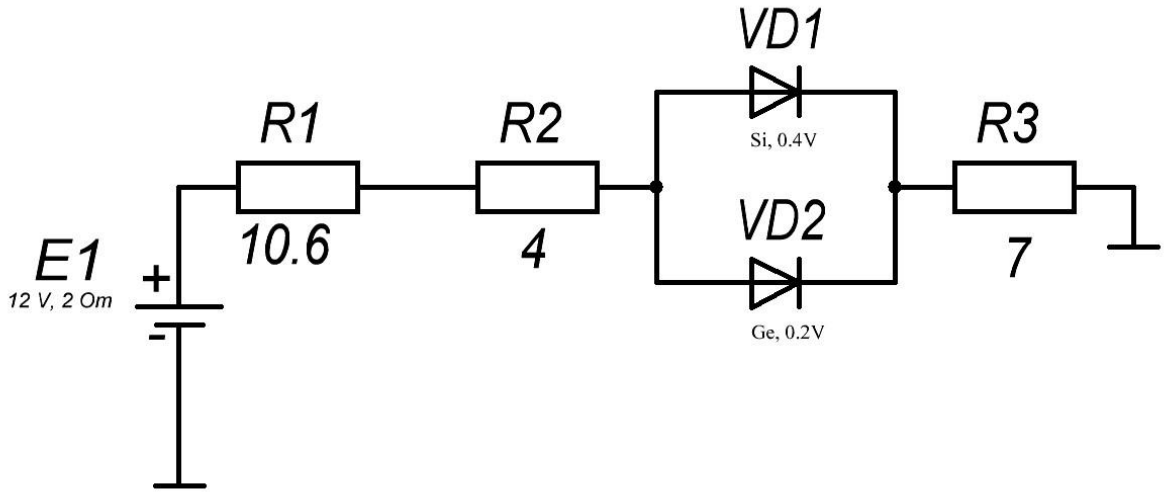
Answer on Question #65455, Physics / Electric Circuits



$$I = \frac{E1}{R_{\text{total}} + R_{\text{internal}}}$$

$$R_{\text{total}} = R1 + R2 + R_{VD1VD2} + R3 = 21.6 + R_{VD1VD2}$$

Since the diodes are in parallel and have different forward voltage, the diode with smaller forward voltage appears first and all the current will flow through it follows from this that the voltage drop on the diode Assembly is equal to 0.2 V (forward voltage of a germanium diode) and so the resistance of the diode assemblies is equal to the resistance of open a germanium diode, it follows:

$$R_{VD1VD2} = R_{VD2} = \frac{0.2}{I}$$

$$I = \frac{E1}{R_{\text{total}} + R_{\text{internal}}} = \frac{12}{21.6 + \frac{0.2}{I} + 2} = \frac{12}{23.6 + \frac{0.2}{I}}$$

$$I = \frac{12}{23.6 + \frac{0.2}{I}}$$

$$I \cdot (23.6 + \frac{0.2}{I}) = 12$$

$$23.6 \cdot I + 0.2 = 12$$

$$23.6 \cdot I = 11.8$$

$$I = 0.5$$

answer: $I = 0.5A$, $V_{VD1} = V_{VD1} = 0.2V$