

Chapter 15 DC Circuit Notes Answers

Furthur Your Understanding 4

Effective resistance of B and C: $\left(\frac{1}{3} + \frac{1}{6}\right)^{-1} = 2 \Omega$

Let V_A be V . By potential divider principle, $V_B = V_C = 2V$

Thus, $P_A = \frac{V^2}{1}$ $P_B = \frac{(2V)^2}{3} = \frac{4}{3}V^2$ $P_C = \frac{(2V)^2}{6} = \frac{2}{3}V^2$

Order: C, A, B

Furthur Your Understanding 5

Effective resistance of R_1 and $R_2 = 1 \Omega$

Reading on ammeter = $\frac{\epsilon}{R_T} = \frac{24}{2+2+1} = 4.8 \text{ A}$

Reading on voltmeter = $\epsilon - Ir = 24 - (4.8)(2) = 14.4 \text{ V}$

Furthur Your Understanding 6

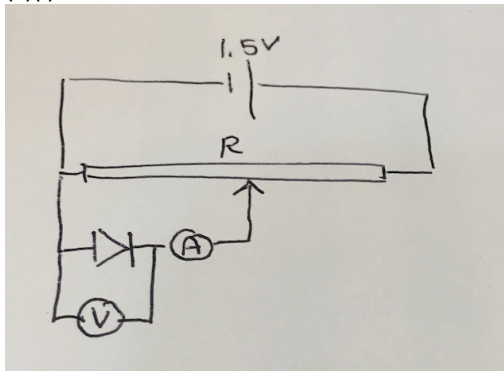
Effective resistance of external resistors: $\left(\frac{1}{4} + \frac{1}{2} + \frac{1}{400}\right)^{-1} = 1.329 \Omega$

By potential divider principle, Reading on voltmeter = $\frac{1.329}{1.329+2} \times 24 = 9.58 \text{ V}$

Reading on ammeter = $\frac{9.58 \text{ V}}{2 \Omega} = 4.8 \text{ A}$

Furthur Your Understanding 8

(c)(i)



(ii) The p.d. across diode is same as that of the section of R it is connected in parallel to.

By potential divider principle, the p.d. across the section of R connected to diode can be varied between 0 and 1.5 V.

Further Your Understanding 9

(b)(i) $1.25 \text{ k}\Omega$

(ii) by PDP, $\frac{5}{5+1.25} \times 9.0 = 7.2 \text{ V}$

(c) Between 2.5°C to 30°C , the reading on the voltmeter would range from 5.3 to 7.2 V, which is less than 25% of the total range of the voltmeter. Thus, the sensitivity of the apparatus is not maximized.

Further Your Understanding 11

Since the potential across the 3Ω resistor is identical, there is no p.d. across the 3Ω resistor

.

Thus, its p.d. is always zero and it can be ignored in the circuit.

Effective resistance of remaining 4 resistors = $\left(\frac{1}{4+2} + \frac{1}{8+4} \right)^{-1} = 4.8 \Omega$