DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth
DATE :

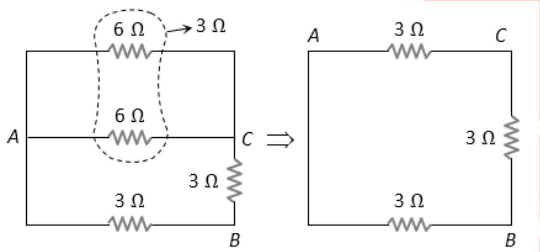
Solutions

SUBJECT : PHYSICS
DPP NO. : 3

Topic :- Current Electricity

1 **(c)**
For semiconductors, resistance decreases on increasing the temperature

2 **(b)**
Given circuit is equivalent to



So the equivalent resistance between points A and B is equal to
$$R = \frac{6 \times 3}{6+3} = 2\Omega$$

3 **(d)**
Energy consumed in $kWh = \frac{watt \times hour}{1000}$
$\Rightarrow$ For 30 days, $P = \frac{10\times50\times10}{1000} \times 30 = 150 kWh$

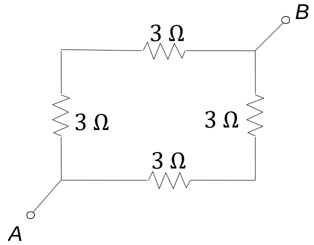
4 **(a)**
Ammeter is always connected in series and Voltmeter is always connected in parallel

5 **(c)**
$$It = \frac{m}{z} = \frac{5\times10^{-3}}{3.387\times10^{-7}}$$
$= \frac{5\times10^4}{3.387\times60\times60}$ Ah = 4.1 Ah

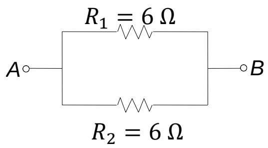
6 **(d)**
$$\frac{R_1}{R_2} = \frac{(1+\alpha t_1)}{(1+\alpha t_2)} \Rightarrow \frac{5}{6} = \frac{(1+\alpha\times50)}{(1+\alpha\times100)} \Rightarrow \alpha = \frac{1}{200} \text{ per °C}$$
Again by $R_t = R_0(1+\alpha t)$
$$\Rightarrow 5 = R_0\left(1+\frac{1}{200}\times50\right) \Rightarrow R_0 = 4\Omega$$

7 **(d)**

Given, the resistance of wire R=12Ω. The wire is bent in square form



$R_1 = 3 + 3 = 6\Omega$
$R_2 = 3 + 3 = 6\Omega$



$\frac{1}{R'} = \frac{1}{6} + \frac{1}{6}$
or $\frac{1}{R'} = \frac{2}{6}$
or $R' = 3\Omega$

8 **(a)**

Chemical equivalent of gold $= \frac{197.1}{3} = 65.7$

Gold to be deposited $= \frac{200\times5}{100}$ =10g

Electrochemical equivalent of gold

$$z_2 = \frac{W_2}{W_1} z_1 \; z_2 = \frac{65.7}{1.008} \times 0.1044 \times 10^{-4} \text{gC}^{-1}$$

Also $m = zIt, t = \frac{m}{zI}$

$$\Rightarrow = \frac{10}{\left(\frac{65.7}{1.008} \times 0.1044 \times 10^{-4} \times 2\right)}$$

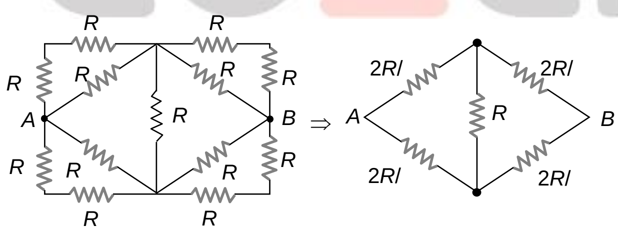
= 7347.9s

9 **(d)**

$I^2 \times 6 = 60$ or $I = \sqrt{10}$ A

Current through upper branch $= 2\sqrt{10}$A. Heat produced per second 3Ω $=$ $(2\sqrt{10})^2 \times 3$ cal = 120 cal.

10 **(c)**



Hence $R_{eq} = \frac{2R}{3}$ [Since it's a balanced Wheatstone bridge]

11 **(d)**

Because cell is in open circuit

14 **(c)**

$$v_d = \frac{I}{nAe} = \frac{20}{10^{29} \times 10^{-6} \times 1.6 \times 10^{-19}} = 1.25 \times 10^{-3} \text{m/s}$$

15 **(b)**

Let R be the resistance of each lamp and V be the voltage supplied to the circuit. Current in the circuit is

$I_1 = \frac{V}{R + \frac{R \times R}{R+R}} = \frac{2V}{3R}$

Current flowing through B or C,

$I_2 = \frac{I_1}{2} = \frac{1}{2}\left(\frac{2V}{3R}\right) = \frac{V}{3R}$

When C is fused, the whole current flows through A and B.

Then , $I_2' = V/2R$

So current through A decreases and current through B increases. Therefore brilliance of A decreases and that of B increase.

16 **(c)**

As for an electric appliance $R = \frac{V^2}{P}$.

For first bulb, its resistance

$R_2 = \frac{V^2}{P_1} = \frac{250 \times 250}{100} = 625\ \Omega$

For second bulb, its resistance

$R_2 = \frac{V_2^2}{P_2} = \frac{200 \times 200}{100}$

$= 400\ \Omega$

Now, in series potential divides in proportion to resistance.

So, $V_2 = \frac{R_2}{(R_1 + R_2)} V$

Where V is supply voltage.

∴ Potential drop across bulb B_2.

$V_2 = \frac{400}{(625 + 400)} \times 250$

$= 97.56$ V

$= 98$ V

17 **(d)**

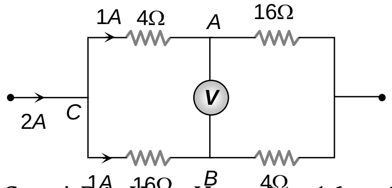
Equivalent weight of aluminium $= \frac{27}{3} = 9$

So 1 $faraday = 96500\ C$ are required to liberate 9 gm of Al

18 **(a)**

In the following circuit potential difference between

C and A is $V_C - V_A = 1 \times 4 = 4$ ...(i)



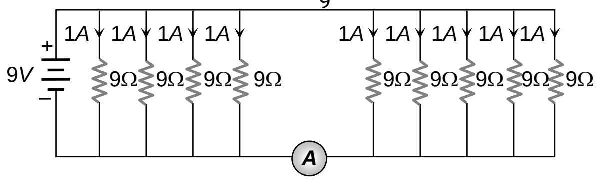
C and B is $V_C - V_B = 1 \times 16 = 16$ ...(ii)

On solving equations (i) and (ii) we get

$V_A - V_B = 12V$

19 **(a)**

Equivalent resistance $R = \frac{9}{9} = 1\Omega$



Current $i = \frac{9}{1} = 9A$

Current passing through the ammeter $= 5A$

20 **(b)**

Power, $P = \frac{V^2}{R}$

$R = \frac{V^2}{P} = \frac{(60)^2}{160} = 22.5\Omega$

Now, according to Ohm's law

V=IR

$\therefore\ I = \frac{60}{22.5}$

$\Rightarrow I = 2.6A$

Here, $t = 60s$

As $I = \frac{ne}{t}$

$\Rightarrow\ n = \frac{I \times t}{e}$

$= \frac{26 \times 60}{1.6 \times 10^{-19}} \approx 10^{21}$

ANSWER-KEY

Q.	1	2	3	4	5	6	7	8	9	10
A.	C	B	D	A	C	D	D	A	D	C
Q.	11	12	13	14	15	16	17	18	19	20
A.	D	C	B	C	B	C	D	A	A	B