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Ans no. 1

Here,

$\Delta V = (V_+) - (V_-)$

$= 10 - (-30)$

$= 40V$

$R = 10\Omega$

We know,

$V = IR$

or, $I = \frac{V}{R}$

$= \frac{40}{10} = 4A$ (Ans.)

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Ans no. 2

$V_A = 22V$ $\qquad\qquad$ $V_B = ?$

We know,

$W = q\,\Delta V$

or, $\Delta V = \dfrac{10}{-2} = -5V.$

Again,

$\Delta V = V_A - V_B$

or, $-5V = 22V - V_B$

or, $V_B = (22+5)V$

$= 27V$

(Ans.)

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Ans no. 3

We Know,

Current exiting a node ⇒ (add

" entering " " ⇒ (subtract).

Total algebraic sum = 0

Given,

$I_1 = 12\,mA$

$I_2 = 9\,mA$

$I_3 = -1\,mA$

$I_4 = ?$ [Unknown current be I_4]

Now,

$-I_1 + I_2 + I_3 + I_4 = 0$

or $I_4 = I_1 - I_2 - I_3$

$= 4\,mA$ ~~[exit~~ [exiting]

$\therefore I_4 = +4\,mA$ or, $+4 \times 10^{-3}\,A$ (Ans.)

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Ans no. 4

Here,

-1.602×10^{-19} C is consisted by 1 electron

1 C " " " $\frac{1}{-1.602 \times 10^{-19}}$ "

-8.01 C " " " $\frac{-8.01}{-1.602 \times 10^{-19}}$ "

$= 5 \times 10^{19}$ electrons.

(Ans.)

Ans no. 5

Given,

$V_A = -22$ V

$V_B = -7$ V

$q = -5$ C

We know,

$W = q . \Delta V$

$= q . (V_A - V_B)$

$= -5 \times (-22 - (-7))$.

$= 75$ Joule. (Ans)