EE331 PS 1 | Prob 1.11, 1.16, 2.8, 2.12, 2.13, 2.18

P1.11 a) 85 mA for 12 h

$$\text{coulombs} = \frac{\text{coulombs}}{\text{sec}} \cdot \text{sec} = \frac{0.085\ C}{1\ \text{sec}} \cdot \frac{3600\ \text{sec}}{1\ h} \cdot 12\ h$$

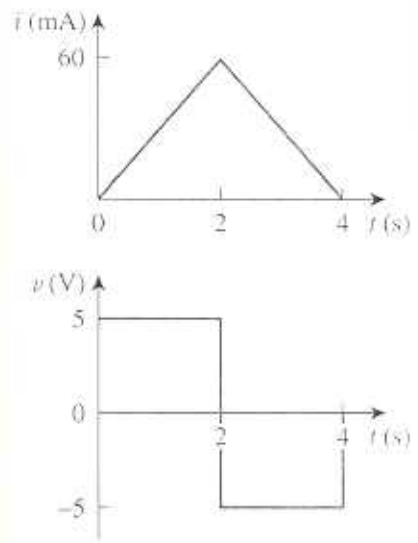
$$\boxed{Q = 3672\ C}$$

b) $v = 1.2\ V$

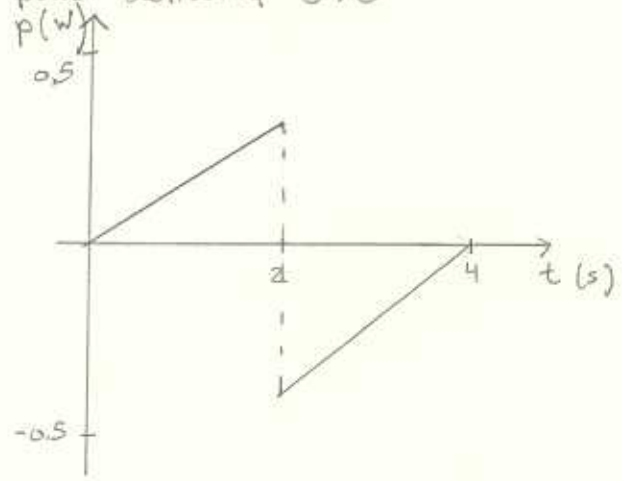
$$\text{joules} = \frac{\text{joules}}{\text{coulomb}} \cdot \text{coulomb}$$

$$= (1.2\ V)(3672\ C) = \boxed{4406\ J}$$

P1.16

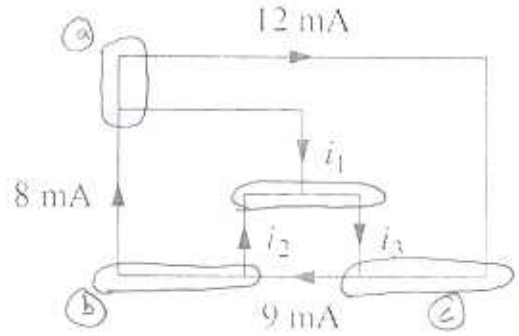


a. sketch power delivered $t > 0$



b) $w = \int_0^4 p(t)\,dt = \boxed{0\ W}$

P2.8



KCL ⓐ $8 + (-12) + -i_1 = 0$

$$\boxed{i_1 = -4\ mA}$$

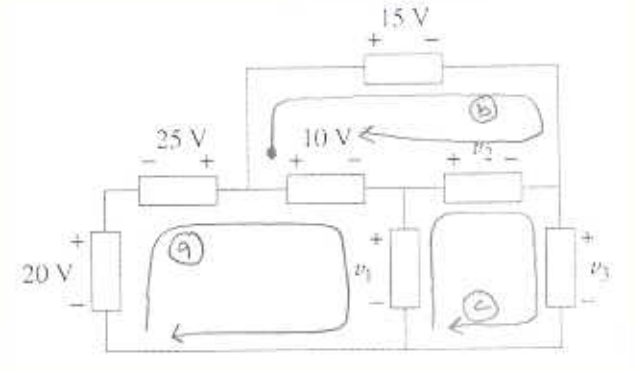
ⓑ $9 - 8 - i_2 = 0$

$$\boxed{i_2 = 1\ mA}$$

ⓒ $i_3 - 9 + 12 = 0$

$$\boxed{i_3 = -3\ mA}$$

P 2.12



KVL (a) $-20 - 25 + 10 + V_1 = 0$

$\boxed{V_1 = 35\ V}$

(b) $+15 - V_2 - 10 = 0$

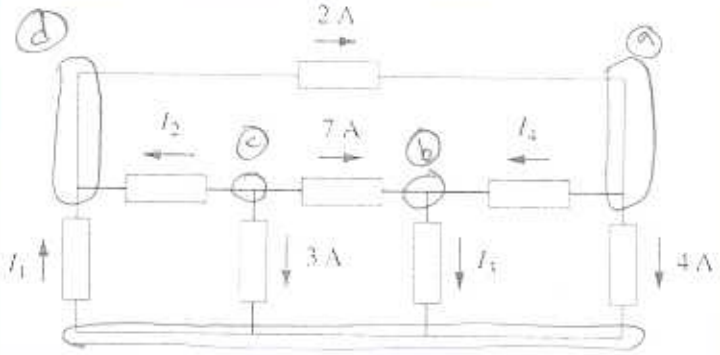
$\boxed{V_2 = 5\ V}$

(c) $-V_1 + V_2 + V_3 = 0$

$-35 + 5 + V_3 = 0$

$\boxed{V_3 = 30V}$

P 2.13



KCL (a) $2 - I_4 - 4 = 0$

$\boxed{I_4 = -2\ A}$

(b) $7 + I_4 - I_3 = 0$

$7 - 2 = I_3$

$\boxed{I_3 = 5\ A}$

(c) $-I_2 - 7 - 3 = 0$

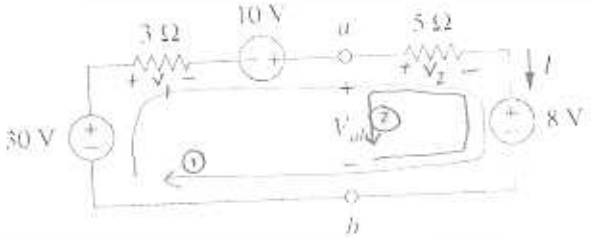
$\boxed{I_2 = -10\ A}$

(d) $I_1 + I_2 - 2 = 0$

$I_1 - 10 - 2 = 0$

$\boxed{I_1 = 12\ A}$

P 2.18



(1) KVL loop $-30 + V_1 - 10 + V_2 + 8 = 0$

$V_1 + V_2 = 32$

$I(3) + I(5) = 32$

$\boxed{I = 4\ A}$

thus $V_2 = 5 \cdot I = 20\ V$

(2) $-8 - V_2 + V_{ab} = 0$ $V_{ab} = 8 + 20 = \boxed{28\ V}$