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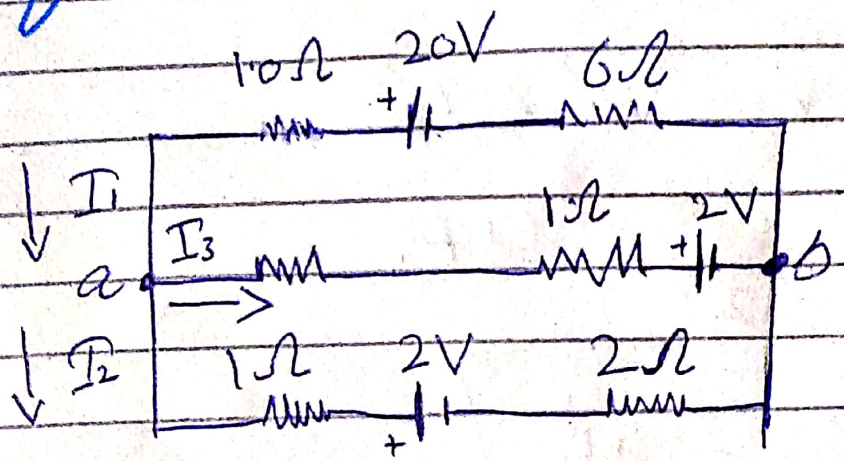
Applied Physics:-

Quiz # 2:-

Solve the following circuit to find unknown current I_1, I_2, I_3.



Given:- voltage = 20V

current in loop 1 (A) = 1A = Ra.

Resistance in loop 2

$R_B = 6\Omega$

current in a = $R_a = 4\Omega$

$R_b = 1\Omega$

$R_c = 1\Omega$

$R_d = 2\Omega$

$Emf = E_1 = 2V$

$Emf_2 = E_2 = 2V$

Apply KCl in loop 1

$$E_1 = V - I_1 R_1 + I_1 R_2 + I_3 R_3 - E_2 - I_2 R_4$$

$$= 20V - I_1 (1\Omega) + I_1 (4\Omega) + I_1 (1\Omega)$$

$$= 20V - 2V - I_1 (2\Omega)$$

$$= 20V - 2V - I_2 (2\Omega)$$

$$18V = I (2\Omega)$$

$$I = \frac{18}{2} = 9A$$

$$\boxed{I_1 = 9A}$$

loop 2 :-

$$2V - I_2 (1\Omega) - I_2 (1\Omega) - E_2 =$$