1) $q = -5mC = -5 \times 10^{-3} C$

$V_1 = -7V, \quad V_2 = 17V$

$\therefore W = q(V_2 - V_1)$

$= -5 \times 10^{-3}(17+7)$

$= -0.12\ J$

2) $I = 2 + 3 = 5A$ (absorbs)

$P_1 = -2 \times 5 = -10W$ (supplies)

$P_2 = 3 \times 5 = 15W$ (absorbs)

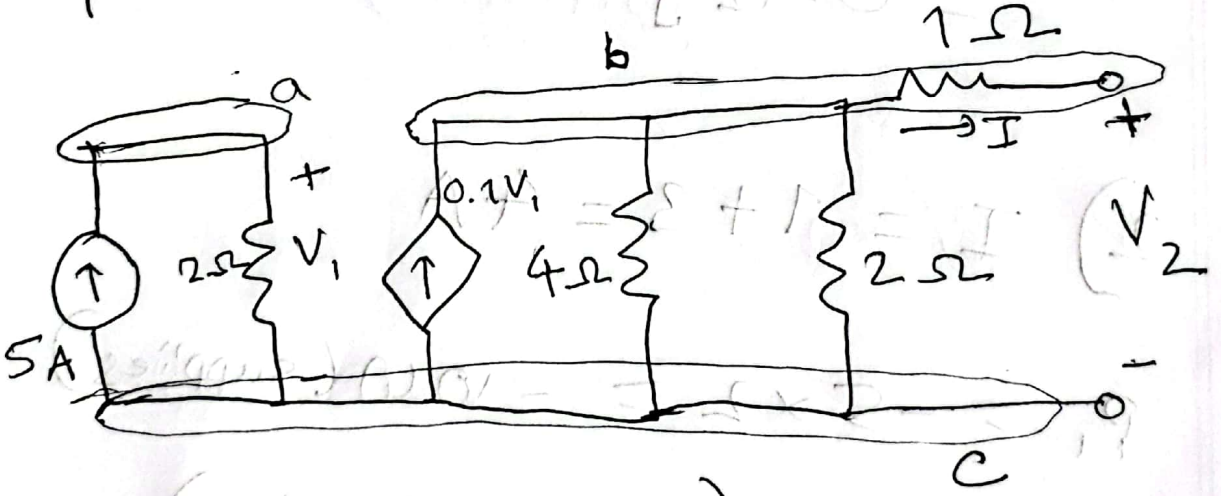
$P_3 = 2 \times 4 = 8W$ (absorbs)

$P_4 = -4 \times 3 = -12W$ (supplies)

$P_5 = 5 \times 5 = 25W$ (absorbs), $P_6 = -3 \times 2 = -6W$ (supplies)

$P_7 = 1 \times 2 = 2W$ (absorbs), $P_8 = -1 \times 2 = -2W$ (supplies)

3) $V_1 = 2 \times 5 = 10V$, Number of nodes = 3



$I = 0$ (open circuit)

$R_{eq} = \left(\frac{1}{4} + \frac{1}{2}\right)^{-1} = 1.33\,\Omega$

$V_2 = 0.1V_1 \times 1.33 = 1.33V$

$P = -0.1V_1 \times V_2 = -1.33W$ (supplies)