**[CO1, CO2] Q1: [10 Marks]** Find the value of $V_x$ $and$ $V_y$ by using Superposition theorem (in Figure-1).



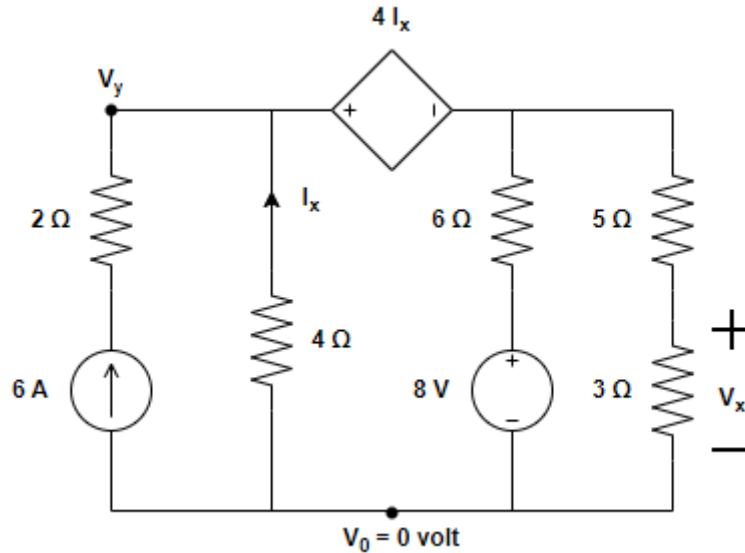**Figure 1**

**[CO3] Q2: [10 Marks]** In the circuit shown (in Figure-2) at time $t = 0$ $sec$ the switch (S) is connected to position-A. After one time constant (T=2 sec) the switch (S) is transferred to position-B. Find-
**(a)** Voltage response across capacitor, when the switch is connected to position-A
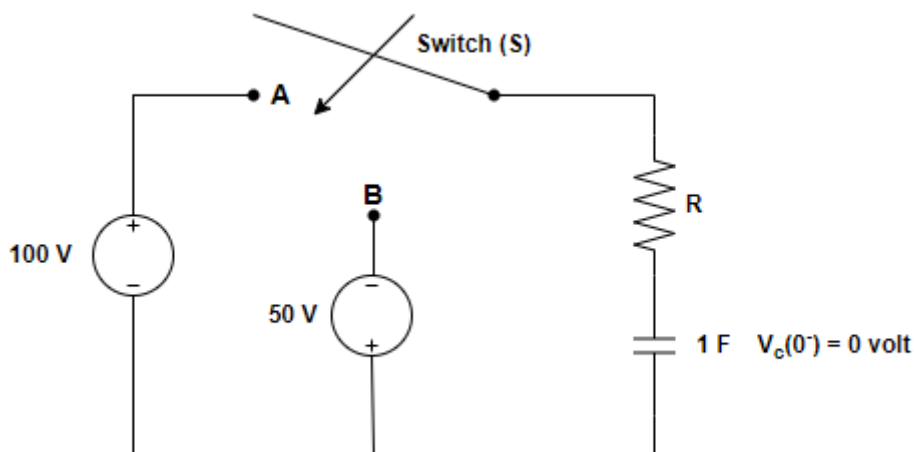**(b)** Current response through capacitor, when the switch is connected to position-B.



**Figure 2**

**[CO3] Q3: [10 Marks]** In Figure-3, find-

**(a)** $i_1(0^+)$          **(b)** $i_2(0^+)$          **(c)** $V_c(0^+)$          **(d)** $\frac{di_1(0^+)}{dt}$          **(e)** $\frac{di_2(0^+)}{dt}$

**(f)** $\frac{d^2 i_1(0^+)}{dt^2}$          **(g)** $\frac{d^2 i_2(0^+)}{dt^2}$
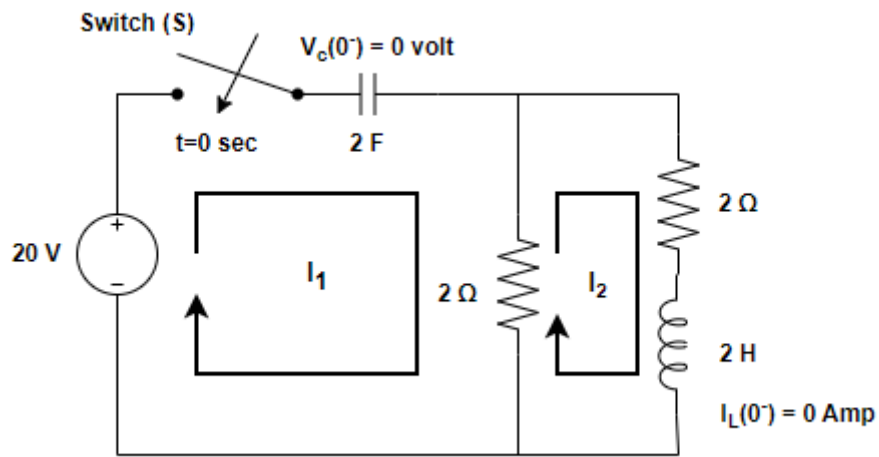
**Figure 3**

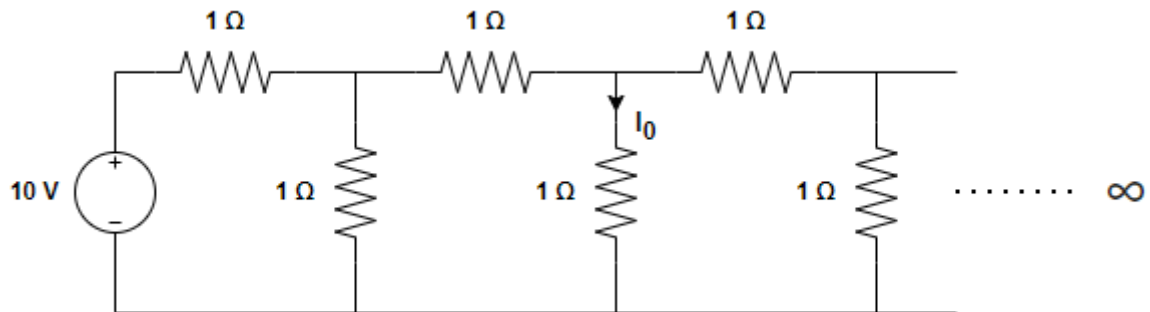**[CO1, CO2] Q4: [5 Marks]** Find the value of current ($I_0$) (in Figure-4).



**Figure 4**

**[CO1, CO2] Q5: [5 Marks]** Find the value of resistance "R" to obtain maximum power transfer from Network-A to Network-B (in Figure-5) at steady state.
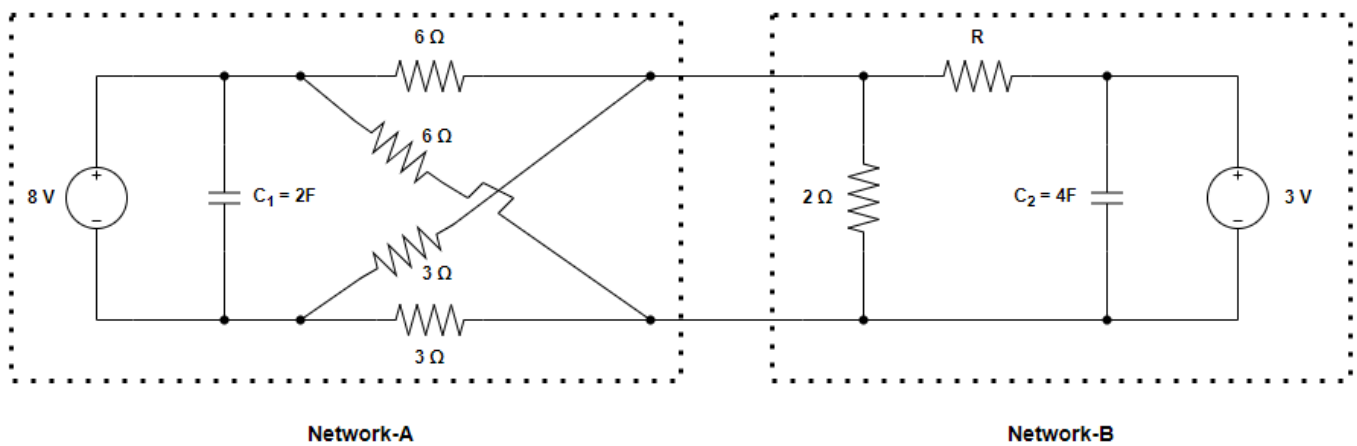


Network-A                                          Network-B

**Figure 5**