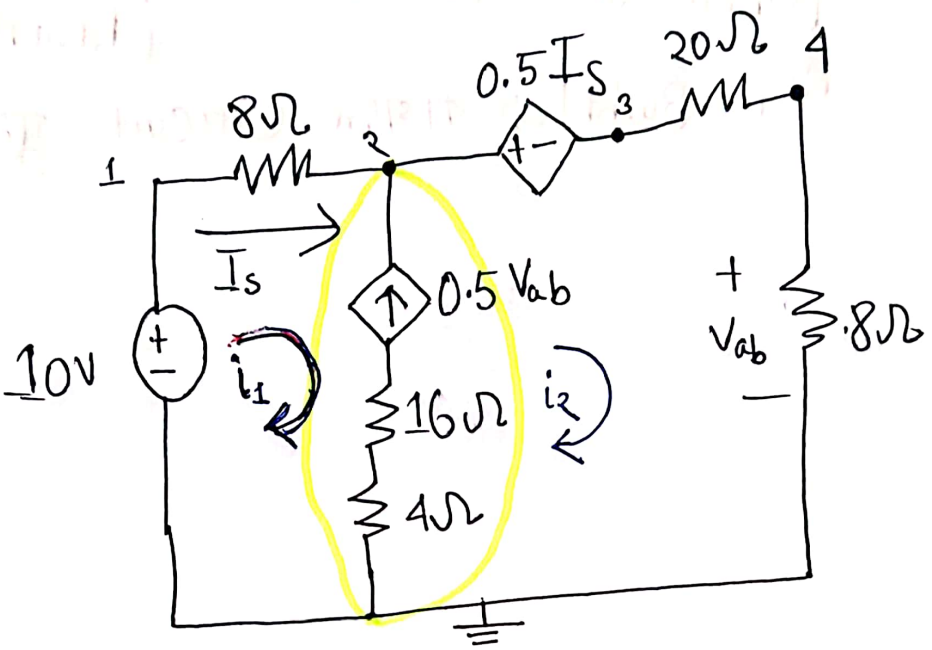
Practice Problem

Lab -4



Using Mesh Analysis

Applying KCL at node 2;

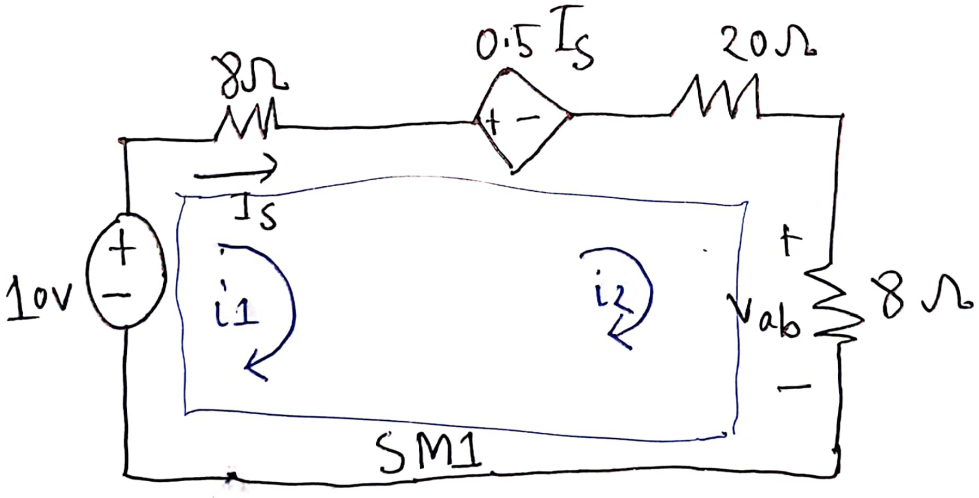
Here, $I_s = i_1$

$$i_2 - i_1 = 0.5 V_{ab}$$

$V = IR$

or, $i_2 - i_1 = 0.5 \times 8 i_2$

$$i_2 - i_1 = 4 i_2 \quad \text{——— (1)}$$



Applying KVL at SM1

$$10 - 8i_1 - 0.5i_1 - 20i_2 - 8i_2 = 0$$

$$\Rightarrow 10 - 8.5i_1 - 28i_2 = 0 \quad \text{——(II)}$$

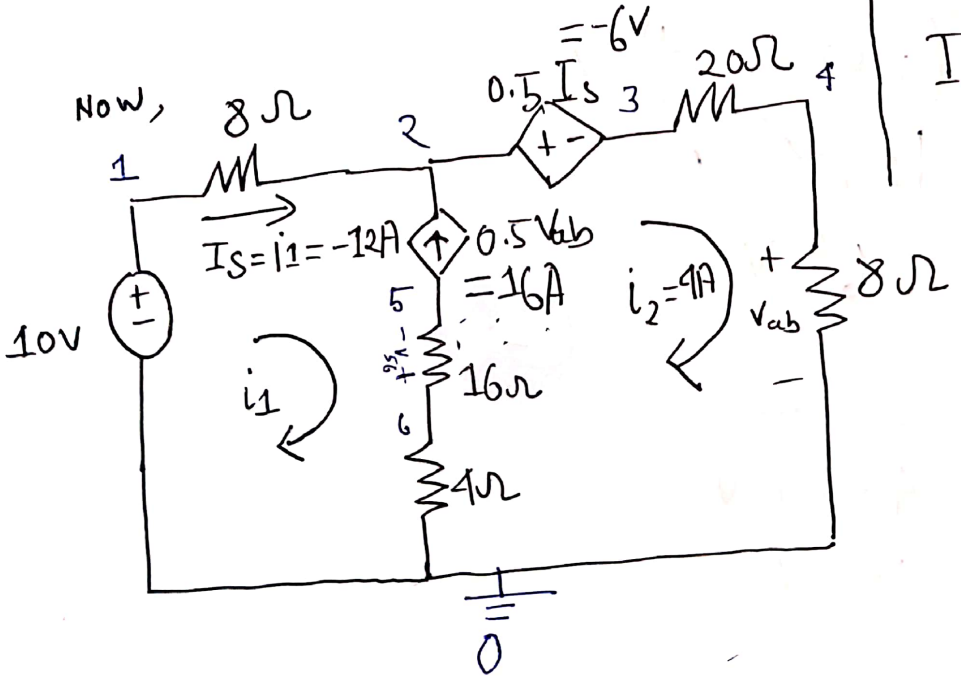
Solving equation (I) and (II) we get

$$i_1 = -12A$$

$$i_2 = 4A$$

$V_{ab} = 8i_2$
$= 8*4$
$= 32\,V$

$I_S = i_1$



$V_{12} = 8 \times i_2$

$V_{12} = 8 \times -12\ V$

$= -96\ V$

—o—

$V_{56} = (i_2 - i_1)\,16$

$= (0.5 V_{ab} * 16)\ V$

$= (0.5 * 32 \times 16)\ V$

$= (16 * 16)\ V$

$= 256\ V$

—o—

$V_{60} = (i_2 - i_1)\,4$

$= (0.5 V_{ab} \times 4)\ V$

$= (0.5 \times 32 \times 4)\ V$

$= (16 \times 4)\ V$

$= 64\ V$

—o—

$V_{34} = 4 \times 20\ V$

$= 80\ V$