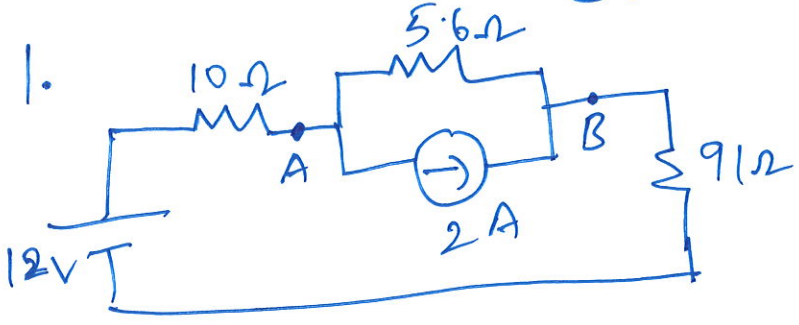
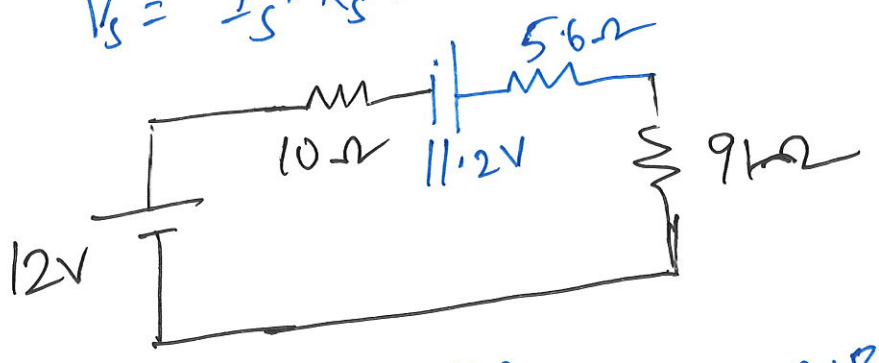
EECE105L TUTORIAL SHEET-4

SOLUTIONS

1.

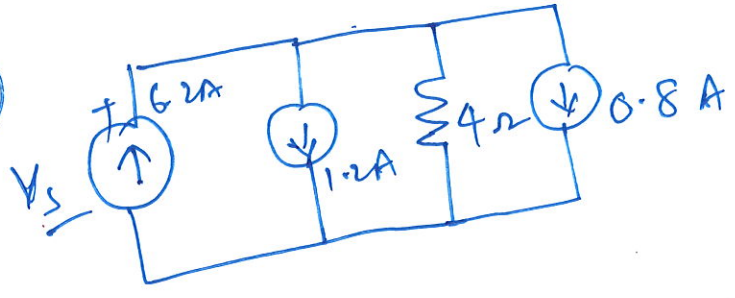


$$V_s = I_s \cdot R_s = 2 \times 5.6 = 11.2\,V$$



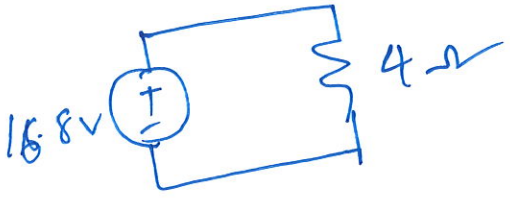
$$I = \frac{12 + 11.2}{10 + 5.6 + 9} = 0.218\,A$$

2)

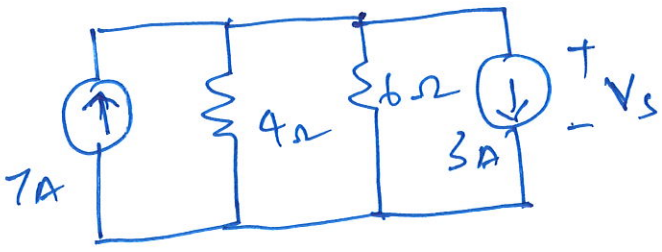


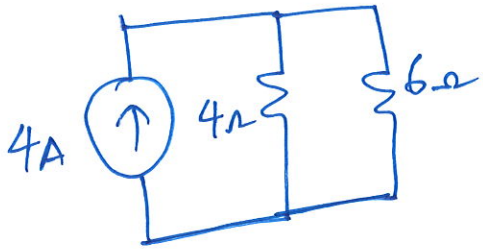
$$I_{4\Omega} = 6.2 - 1.2 - 0.8\,A = 4.2\,A$$

$$V_s = 4.2 \times 4 = 16.8\,V$$



3)





$I_{4\Omega} = \frac{4 \cdot 6}{4+6} = 2.4A$

$4\Omega \| 6\Omega = 2.4\Omega$

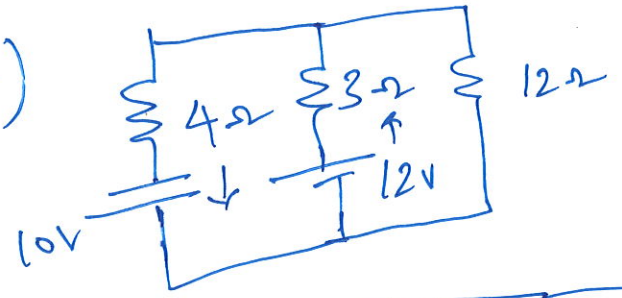
$V_s = 4 \times 2.4 = 9.6V$

9.6 V is voltage across $4\Omega \| 6\Omega$

$\Rightarrow$ 9.6V is voltage across 4Ω and 6Ω and 7A source and 3A source.

Thus, $V_s = 9.6V$

4)

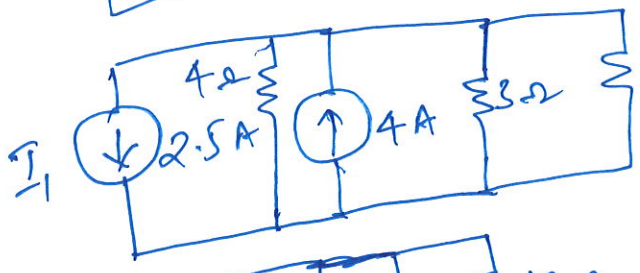


$10V = I_1 \cdot 4\Omega$

$I_1 = 2.5A$

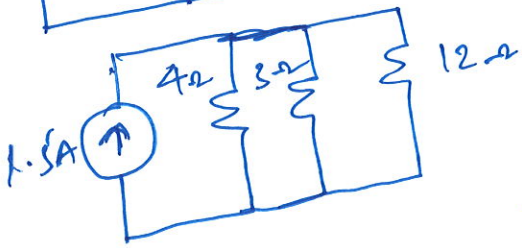
$12V = I \cdot 3\Omega$

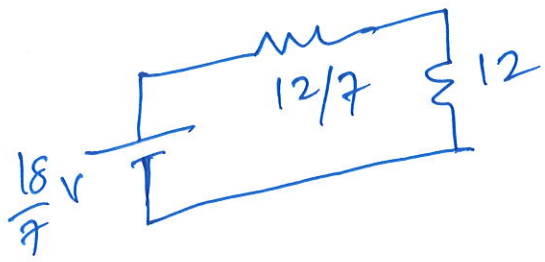
$I_2 = 4A$



$4 \| 3 = 12/7\ \Omega$

$1.5 \times \frac{12}{7} = \frac{18}{7}\ A$

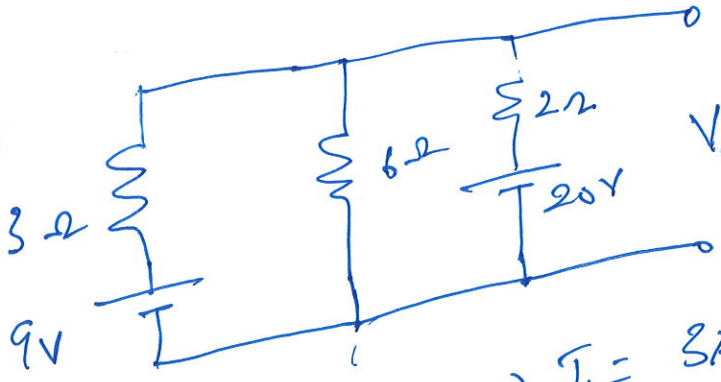




$$I = \frac{18/7}{\left(\frac{12}{7}+12\right)} = \frac{3}{16}\ A$$

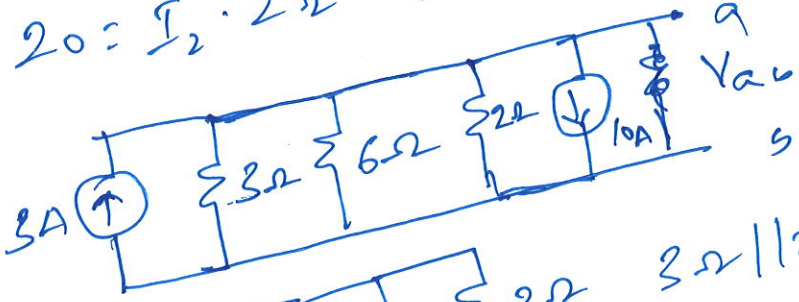
(3)

5)

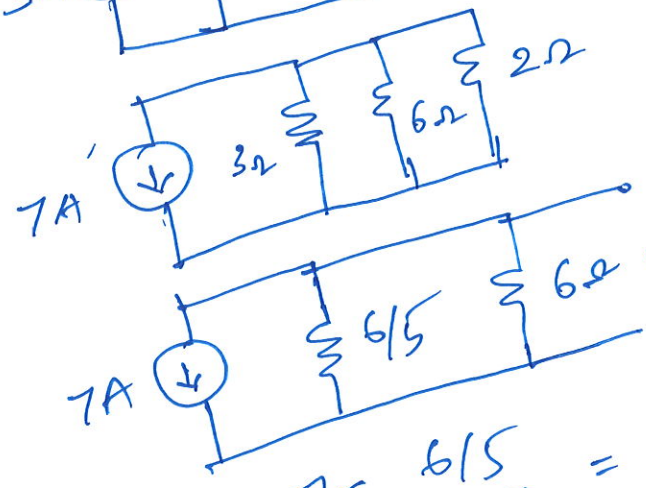


$9 = I_1 \cdot 3\Omega \Rightarrow I_1 = 3A$

$20 = I_2 \cdot 2\Omega \Rightarrow I_2 = 10\ A$



$3\Omega \| 2\Omega = \frac{6}{5}\Omega$

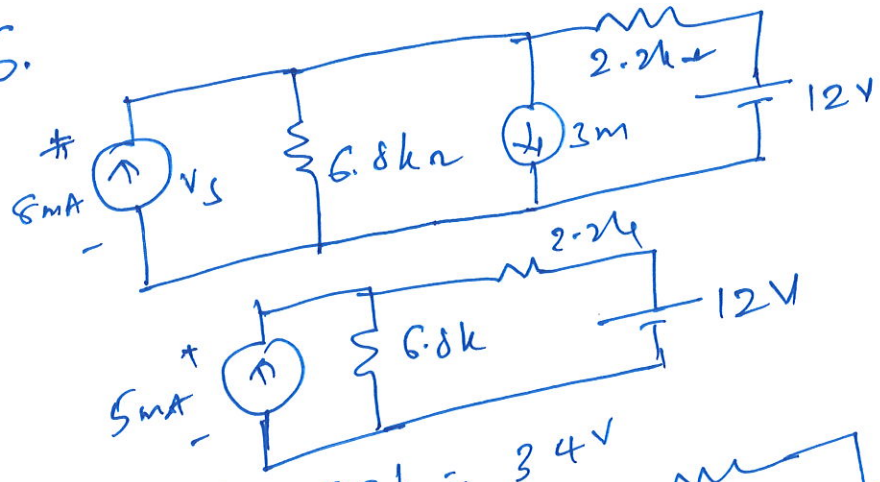


$$I_{6\Omega} = \frac{7 \times 6/5}{(6+6/5)} = \frac{7}{6}\ A$$

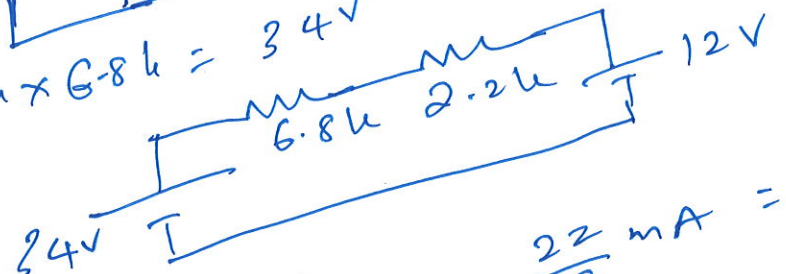
$V_{ab} = -7\ V$

$V_{6\Omega} = 7\ V$

6.

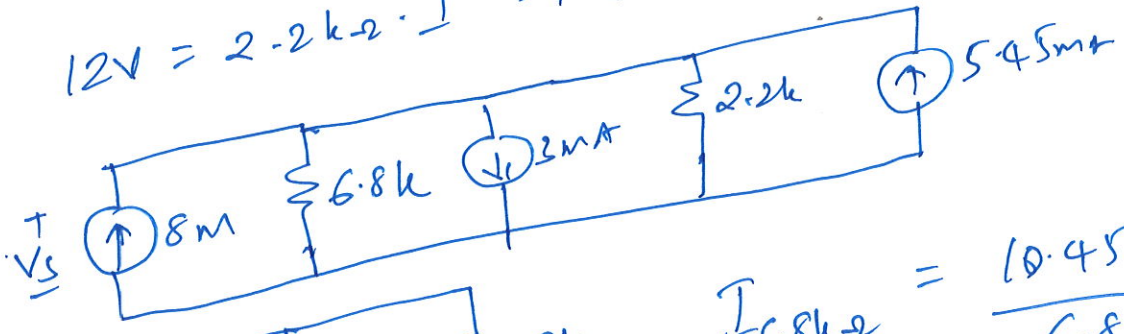


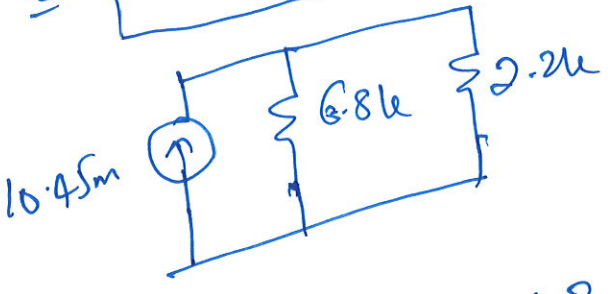
$V = 5m \times 6.8k = 34V$



$I_{24V} = \frac{34-k}{9k\Omega} = \frac{22}{9}mA = 2.44mA$

$12V = 2.2k\Omega \cdot I \Rightarrow I = 5.45mA$





$I_{6.8k\Omega} = \frac{10.45 \times 2.2}{6.8+2.2} = 2.55mA$

$V_{6.8k\Omega} = 6.8k \times 2.55 = 17.35V$