
Analog Electronic Circuits Lab (EC2.103, Spring 2024)
Practise Problems (KCL/KVL) (Due: Monday 8th JAN, 6 pm)
(Instructor: Prof. Abhishek Srivastava, CVEST, IIIT Hyderabad)

Instructions:

1. Submit your practise set solutions as a single pdf (Name_RollNo.pdf) at moodle on or before the due date
 2. Hand-written/typed (latex/word) submissions are allowed
 3. Use moodle for discussion
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1. Find the current through each resistor in the circuit below using KVL. (Ans: $I_3 = 1.66\text{A}$, $I_6 = 1.16\text{A}$, $I_7 = 0.5\text{A}$)

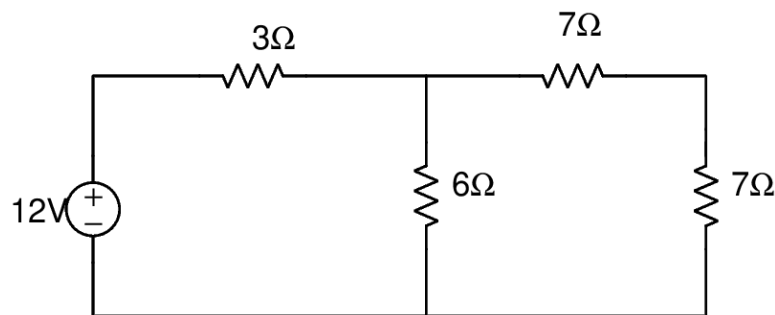


Figure 1

2. Identify the mesh and find the mesh current in the below circuit using mesh analysis. (Ans:(clockwise from left) $I_{mesh1} = 3\text{A}$, $I_{mesh2} = 2\text{A}$, $I_{mesh3} = 3\text{A}$)

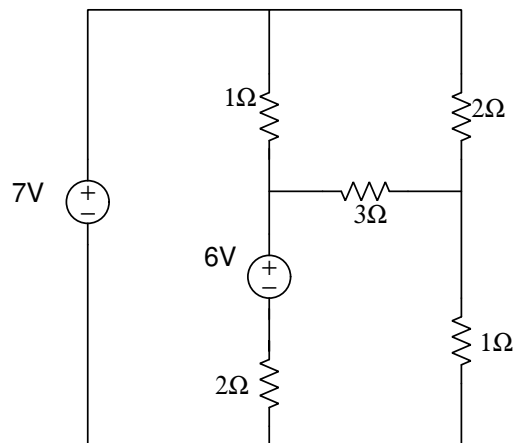


Figure 2

3. Calculate I in the circuit below. (Ans: $I = 2.8\text{A}$)

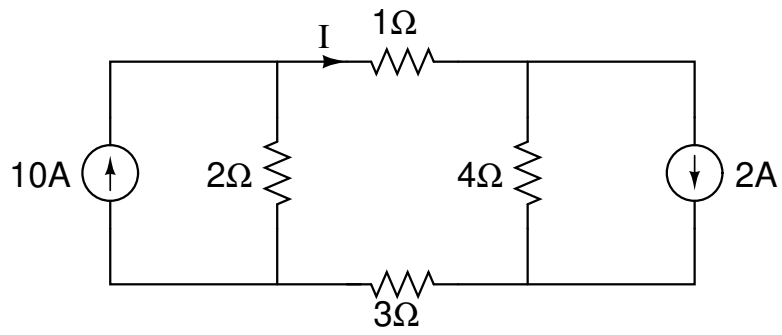


Figure 3

4. Calculate I_s and V_s in the circuit below. (Ans: $I_s = -13\text{A}$, $V_s = 20\text{V}$)

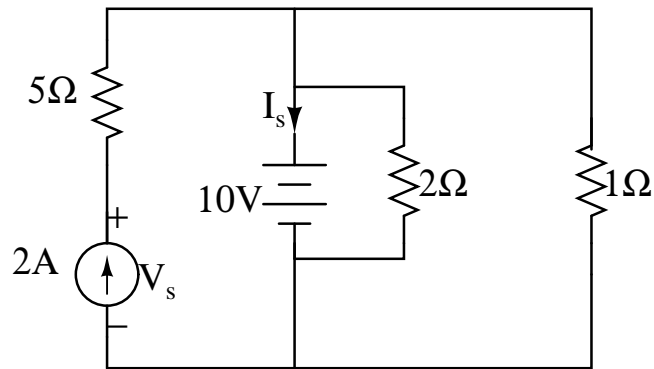


Figure 4

5. Calculate V_x . (Ans: $V_x = -1.5\text{V}$)

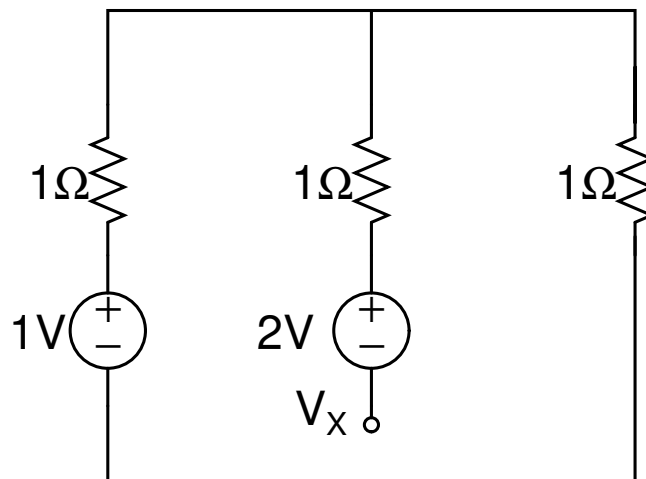


Figure 5

6. Calculate I and V in the circuit below. (Ans: $I = 8A$, $V = 16V$)

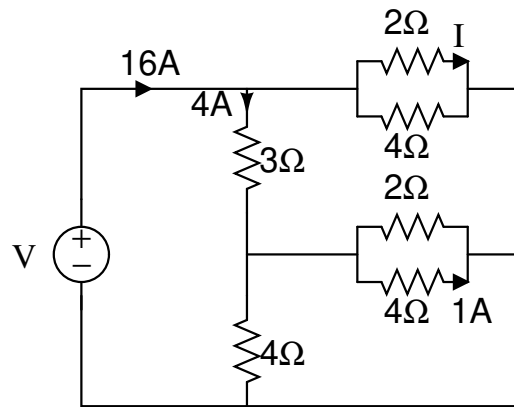


Figure 6

7. Find the value of V_0 by using the nodal analysis. (Ans: $V_0 = 1.11V$)

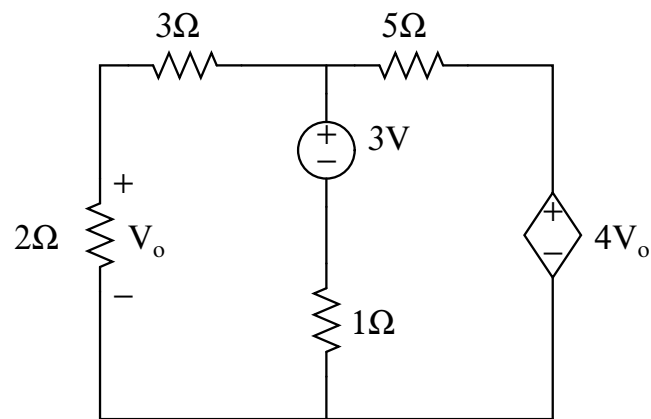


Figure 7

8. In the following circuit find out the value of V_x and the current passing through the 11ohm resistor. (Ans: $V_x = -39/2V$, $I_{11} = 2.85A$)

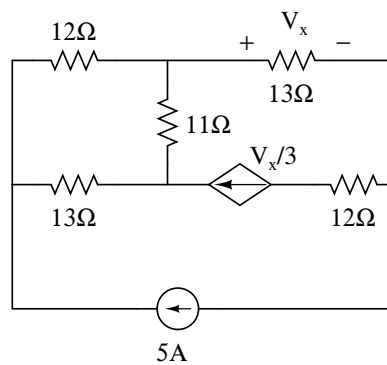


Figure 8

9. Calculate V_{out}/V_{in} in the circuit below. (Ans: $V_{out}/V_{in} = -g_m * R_D$)

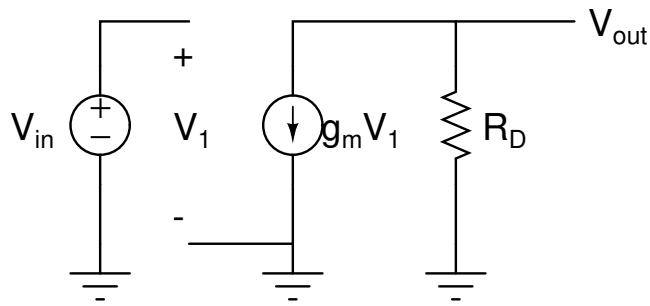


Figure 9

10. Calculate V_{out}/V_{in} in the circuit below. (Ans: $V_{out}/V_{in} = -g_m * (R_D || r_o)$)

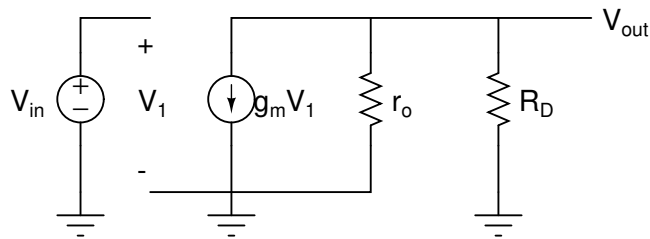


Figure 10

11. Solve solved/unsolved examples of CH-3 (voltage and current laws) and CH-4 (basic nodal and mesh analysis) from Engineering Circuit Analysis by Hayt 7th edition; McGrawHill. (No need to submit this part).