The Hong Kong University of Science and Technology
Department of Electronic and Computer Engineering

ELEC2400 **ELECTRONIC CIRCUITS** FALL 2021-22

HOMEWORK 1

Issued on Sept 19, 2021 (Sunday)
Due on Oct 4, 2021 (Monday, 11:59pm)
Submit your homework online https://canvas.ust.hk
Do not do your work on the question papers. Use separate blank papers

Q1. Determine the power consumed by each circuit element (P_A, P_B, P_C, P_D, P_E and P_F), respectively, and specify whether each circuit component is supplying power or absorbing power (dissipated power) shown in Fig. 1 and Fig. 2.

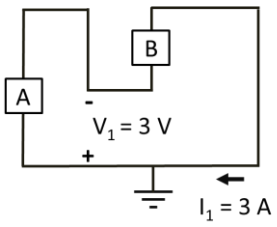

Fig. 1

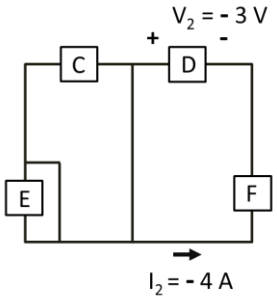

Fig. 2

Q2. Find the resistance R_{AB} between node A and node B in the circuit shown in Fig. 3.

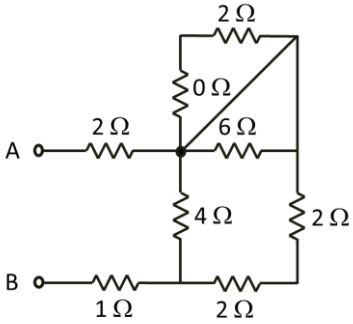

Fig. 3

Q3. Find I_1, V_1 and V_2 for the circuit shown in Fig. 4.

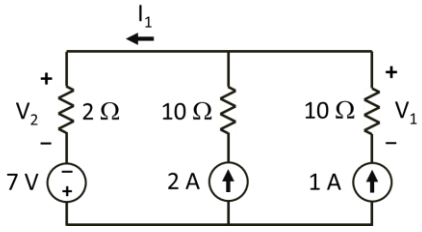

Fig. 4

Q4. Use superposition to find I_1 and V_1 in Fig. 5.

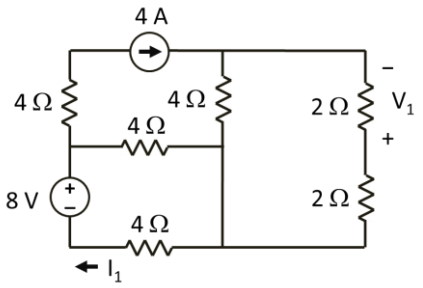

Fig. 5

Q5. Use nodal analysis to find V_1 in the circuit shown in Fig. 6.

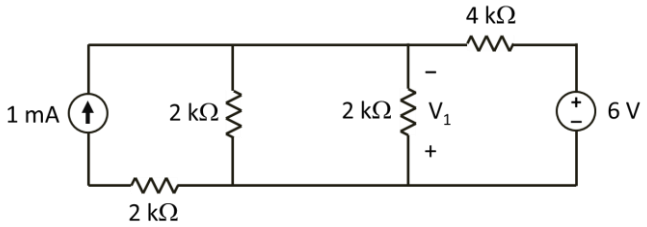

Fig. 6

Q6. Use source transformation(s) to find V_1 and I_1 in Fig. 7.

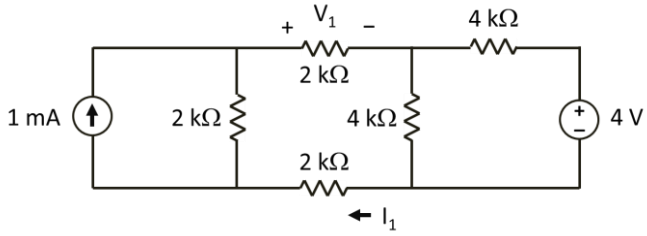

Fig. 7

Q7. Find V_1 and I_1 in Fig. 8.

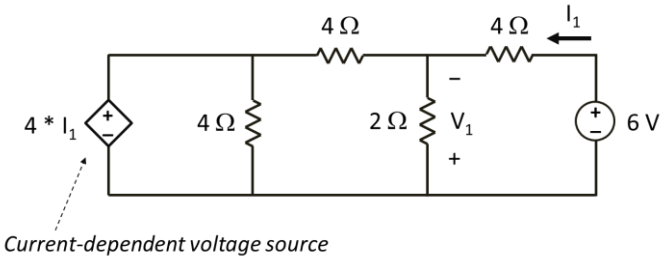

Fig. 8

Q8. Determine the power consumed by each circuit element in Fig. 9. Specify whether each circuit component is supplying or absorbing power (dissipating power), and show the power balance.

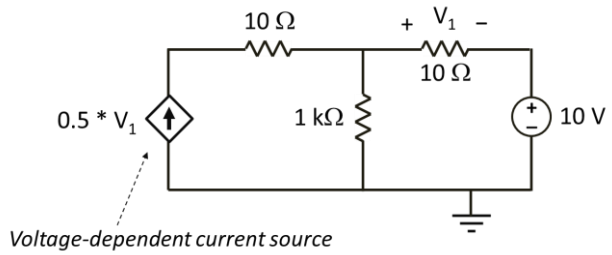

Fig. 9

Q9. Find and draw the Norton's equivalent circuit with respect to terminals a, b in Fig. 10.

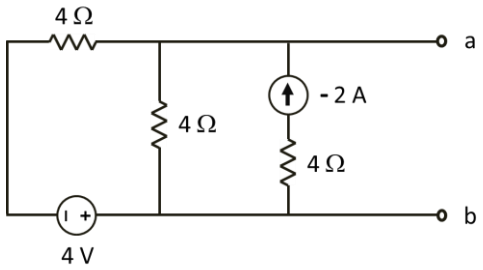

Fig. 10

Q10. Use the Norton's equivalent circuit in Q9 to find V_1 in Fig. 11.

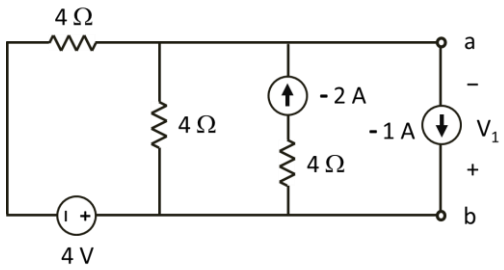

Fig. 11

Q11. Use the Norton's equivalent circuit in Q9 to find and draw the Thevenin's equivalent circuit with respect to terminals a, b in Fig. 12.

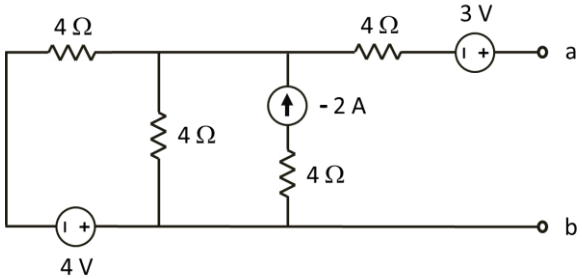

Fig. 12