Assignment-1

1. Find the equivalent resistance between X and Y in the circuit shown in Fig. 1 where R1= 8Ω, R2=R3=2Ω, R4=7Ω.

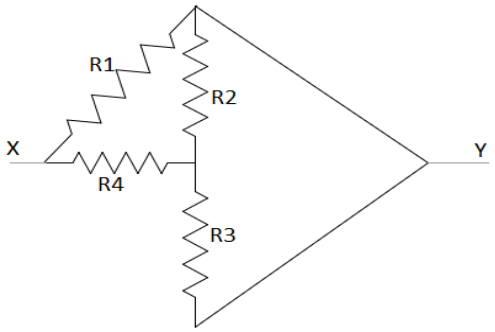

Fig. 1

2. In Fig. 2a and Fig. 2b, R1=50Ω, R2=500Ω, R3=100Ω, R4=50Ω, R5=25Ω and R6=50Ω.
(a) Use current division to find current through R5 in Fig. 2a. I=5mA.
(b) Use voltage division to find voltage across R2 in Fig. 2b. V=10V.

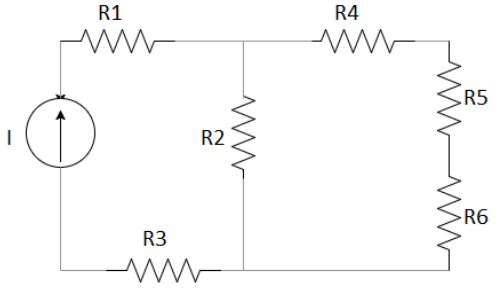

Fig. 2a

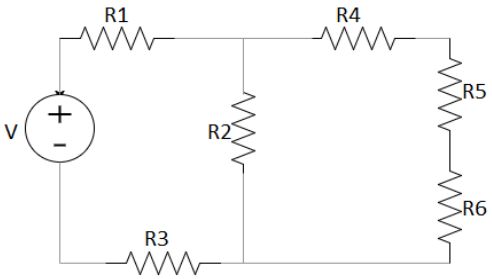

Fig. 2b

3. The digital multi-meter (DMM) is a device commonly used to measure voltages. It is equipped with two leads (usually red for the positive reference and black for the negative reference) and an LCD display. Let's suppose a DMM is connected to the circuit of Fig.3 with the positive lead at the top node and the negative lead on the bottom node. Using KCL, explain why we would ideally want a DMM used in this way to have an infinite resistance as opposed to zero resistance.

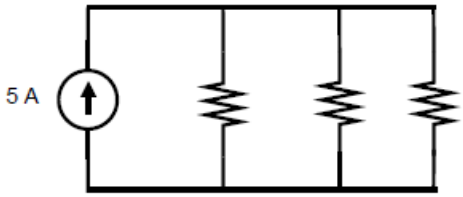

Fig. 3

4. Determine the power dissipated in the 10Ω resistor in Fig. 4.

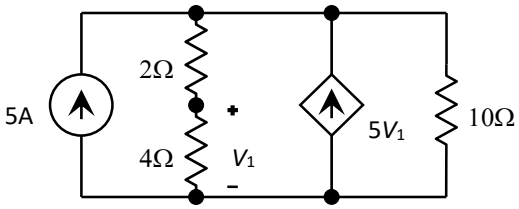

Fig. 4

5. Three appliances --- an 850W coffee maker, a 1200W microwave oven, and a 900W toaster --- are connected in parallel to a 120V circuit with a 15A circuit breaker.
(a) Draw a schematic diagram of this circuit.
(b) Which of these appliances can be operated simultaneously without tripping the circuit breaker?

6. Find V_0 in Fig. 6 using Nodal Method.

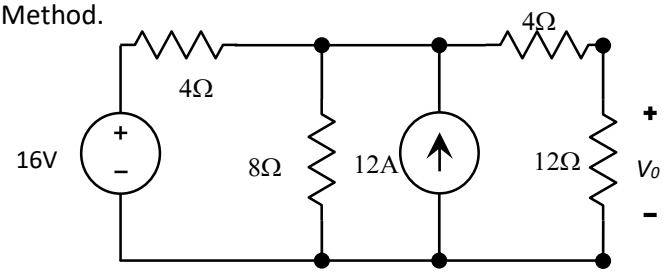

Fig. 6