1. In the circuit shown in Fig.1, determine v_x anb the power absorbed by the 40-Ω resistor. *(20%)*
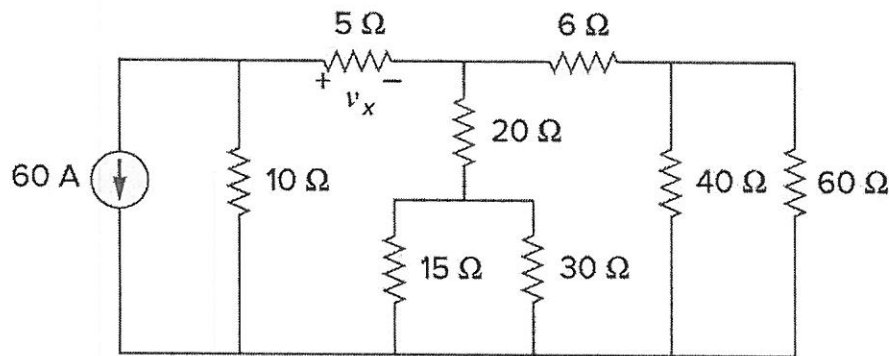

Fig.1

2. The circuit, which shown in Fig.2, is desiged to control the output voltage by the environment light intensity. If the resistance of photo-resistor is 500 kΩ and 1 kΩ with or without light irradiation, respectively. (a) If the potentiometer (variation resistor, R_1) is set at 1 KΩ, calculate the output voltage (V_{out}). (b) If a yellow LED, whose turn on voltage (V_D) is around 2.0 V, is connected to the ourpur terminals, which resistance value of the potentiometer is fit to contral the LED on/off? *(20%)*
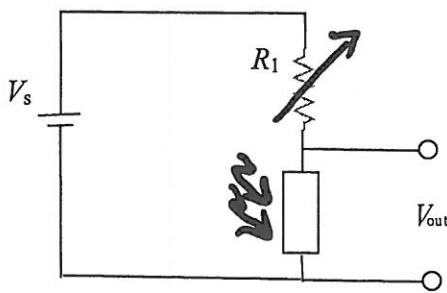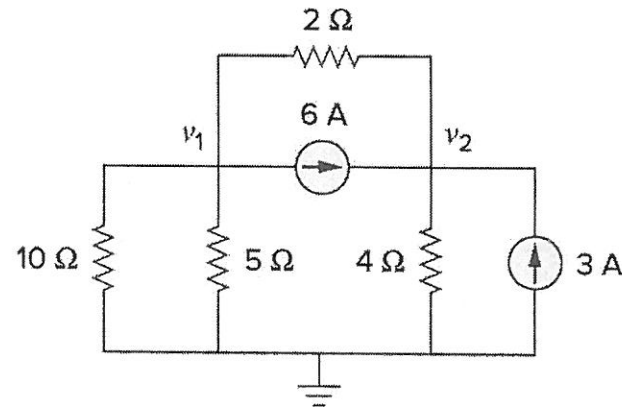

Fig.2

Fig.3

3. For the circuit in Fig.3, find the node voltage v_1 and v_2. *(20%)*

4. (a) Define the meaning of the Thevenin equivalent in a circuit. (b) Find the Thevenin equivalent of the circuit in Fig.4 at the terminals *a-b*. Then find the current through R_L=6 Ω. *(20%)*
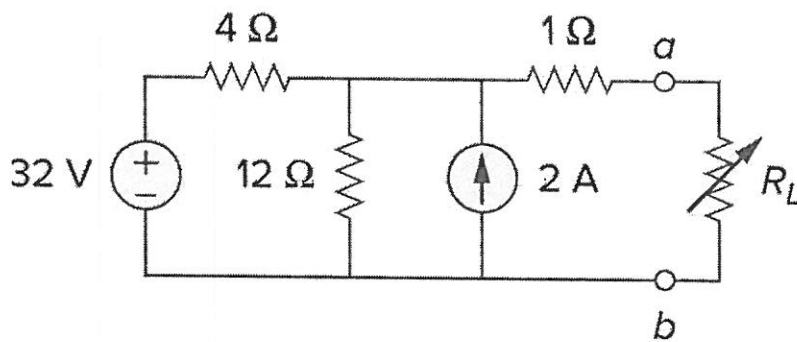

Fig.4

5. (a) What's the meaning of 1000 Ah? (b)Calculate the charge stored on 3-μF capacitor with 20 V across it. (c) Find the energy Stored in the capacitor. *(20%)*