Menoufia University		Department: Civil Engineering
Faculty of Engineering		Subject: Electrical Engineering
Academic Year: 2018-2019		Time Allowed: 2 hours
Second Semester		Date: 3/6/2019

Allowed Tables and Charts: (None), Total marks: 50

Answer of the following questions and assume any missing data.

Question (1)   (15 Marks)

(1-a) What are the step and touch potential? Describe brefely how to decrease these potentials. Give an example

(1-b) A potential difference of 250 V is applied to a field winding at 15 °C and the current is 5 A. What will be the temperature of the winding when current has fallen to 3.91 A, applied voltage being constant. Assume $\alpha_{15} = 1/254.5$ /°C. Also, calculate the power losses in the field winding for the two cases (5A and 3.91 A).

Question (2)   (20 Marks)

(2-a) In the circuit given in Fig. 1, calculate (i) current through the 20 Ω resistor (ii) supply voltage V. All resistances are in ohms.

(2-b) Apply Kirchhoff's Law to find current through 4 ohm resistance in the network shown in Fig. 2. All resistances are in ohms.

(2-c) For the circuit shown in Fig. 3, calculate the current I. Use Thevenin's theorem only.

Question (3)   (15 Marks)

(3-a) A tungsten filament bulb rated at 500 W, 100 V is to be connected to series with a capacitance across 220 V, 50 Hz supply. Calculate:

(i) the value of capacitor such that the voltage and power consumed by the bulb are according to the rating of the bulb.

(ii) the power factor of the current drawn from the supply.

(iii) draw the phasor diagram of the circuit.

(3-b) A star-connected alternator supplies a delta connected load. The impedance of the load branch is (8 + j6) ohm/phase. The line voltage is 230 V. Determine (a) current in the load branch, (b) power consumed by the load, (c) power factor of load, (d) apparent power of load.
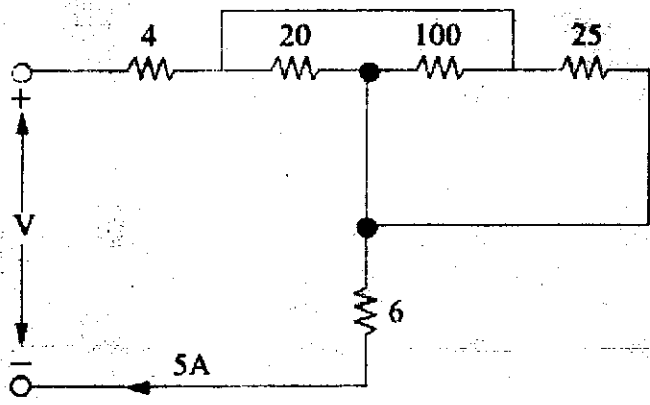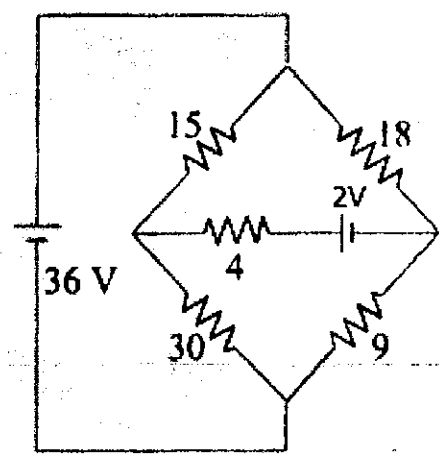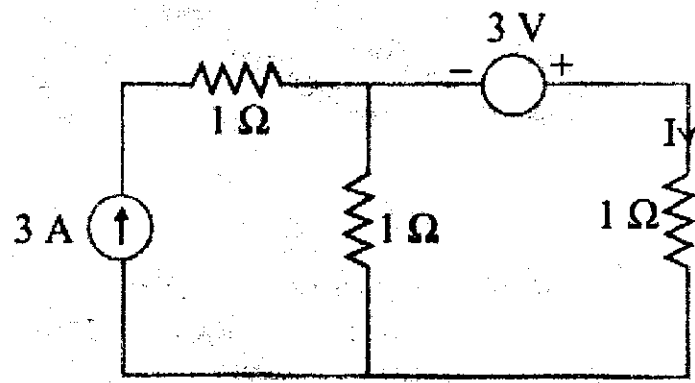
Fig. 1

Fig. 2

Fig. 3

Good Luck ……………………………………………….. Ass. Prof. Amr Abdel-Hady