

Level : B.E./B.Sc.

Course : ENGG 112

Year : I

Semester : II

Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date 15 JAN 2025

SECTION "A"

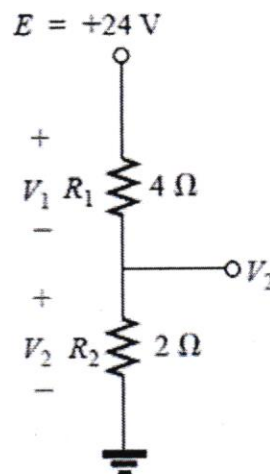
[20Q. \times 0.5 = 10 marks]

Choose and encircle the most appropriate answer. Symbols have their usual meanings.

- What is the resistance of a 100 ft length of copper wire with a diameter of 0.020 in. at 20°C?
a. 4.54 Ω b. 1.57 Ω c. 8.53 Ω d. 2.59 Ω
- How long can a 205-W television set be on before using more than 4 kWh of energy?
a. 19.5 h b. 15.7 h c. 23.9 h d. 11.3 h
- Which of the following elements of electrical engineering cannot be analyzed using Ohm's law?
a. Capacitors b. Inductors c. Transistors d. Resistors

- The value of V_1 and V_2 of the given figure are _____ respectively.

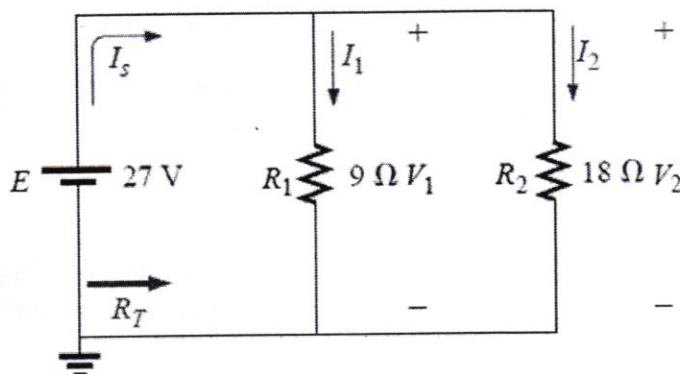
- 16 V, 8 V
- 6 V, 8 V
- 16 V, 2 V
- 4 V, 4 V



- In superposition theorem, when effect of one voltage source is considered, all the other voltage sources are _____
a. Shorted b. Opened c. Removed d. Undisturbed

- The value of branch current, I_1 in the given figure is _____

- 1.5 A
- 6 A
- 3 A
- 8 A



KATHMANDU UNIVERSITY
End Semester Examination [C]
January 2025

Level : B.E./B.Sc
Year : I
Time : 2 hrs. 30 mins.

15 JAN 2025

Course : ENGG 112
Semester : II
F. M. : 40

SECTION "B"

[4Q. × 10 = 40 marks]

Attempt ANY FOUR questions. Symbols have their usual meaning. Students are required to write answer in their own words as far as practicable.

1.
 - a. Find the cutoff frequencies and expression for bandwidth in series RLC circuit. Also obtain the relationship between the Quality factor, resonance frequency and bandwidth for the series RLC circuit. [3+2]
 - b. Find the current I_4 and voltage V_2 for the network of figure-1 [5]

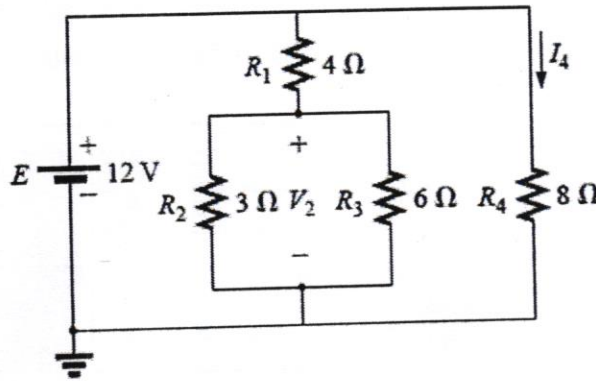


Figure-1

2.
 - a. Find the Thevenin equivalent circuit for the network in the shaded area of the bridge network of figure-2. [5]

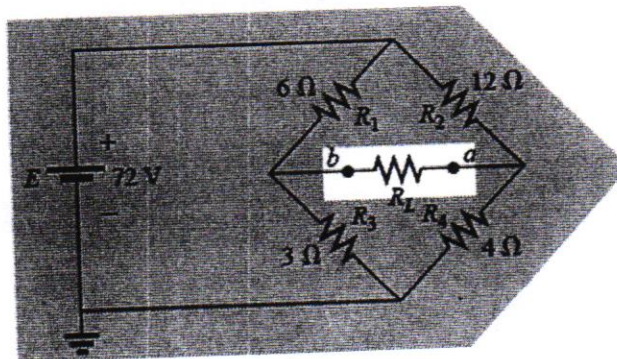


Figure-2

P.T.O.

- b. Using mesh analysis, determine the current through the 5Ω resistor for the network of figure-3. Then determine the voltage V_a . [5]

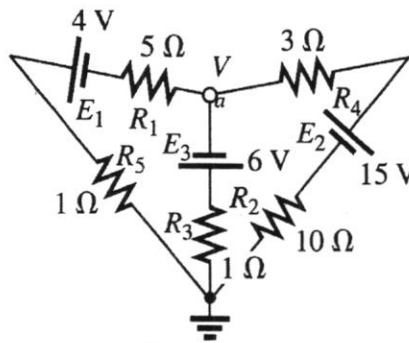


Figure-3

3.

- a. For the iron-core transformer ($k = 1$) of figure-4 (a) find the magnitude of the induced voltage E_s (b) find the maximum flux ϕ_m (c) if the maximum flux passing through the core is 12.5 mWb , find the frequency of the input voltage. [5]

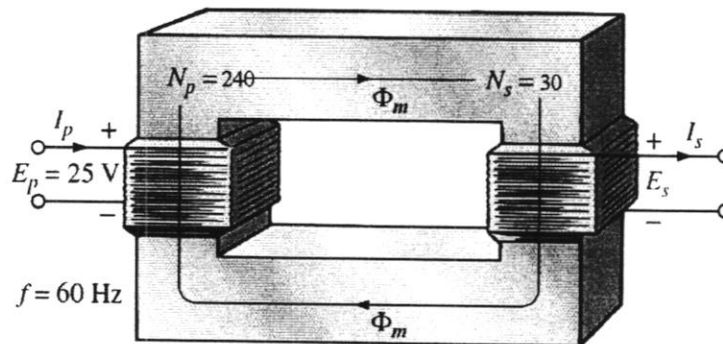


Figure 4

- b. Find the current I_s for the network shown in figure-5. [5]

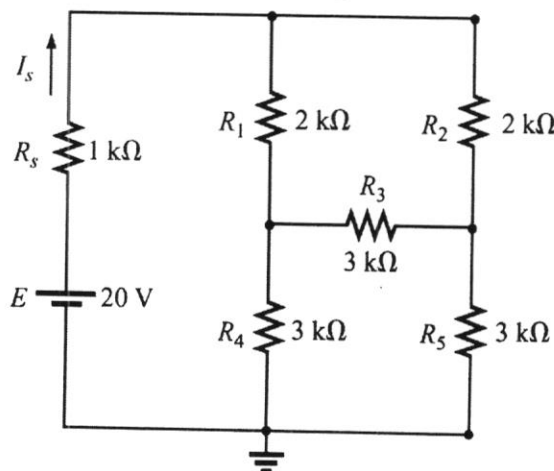


Figure-5

5 JAN 2025

4.

- a. With the help of suitable diagrams, show that the magnitude of the line current of a Δ -connected three phase generator is $\sqrt{3}$ times the phase current and line voltage is equal to phase voltage. [5]
- b. Using superposition theorem, find the current I through 4Ω reactance for the network of figure-6. [5]

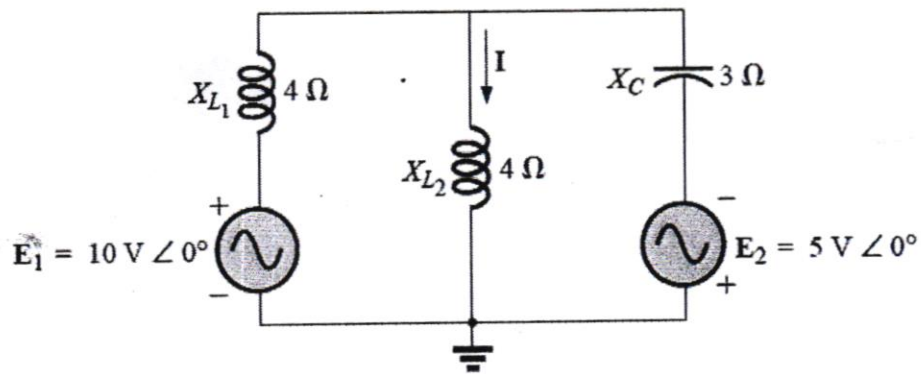


Figure-6

5.

- a. Determine the nodal voltages V_1 and V_2 of Figure-7 using the concept of a super node [4]

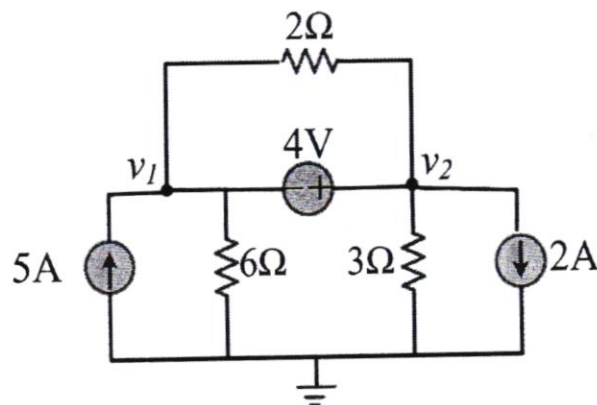


Figure-7

- b. How does a DC motor work? Explain with the help of suitable diagram. [2]

- c. The phase sequence of the Y-connected generator in figure 8 is ABC. (a) find the phase angle θ_1 and θ_2 (b) Find the magnitudes of the line voltages (c) Find the line currents (d) Verify that, Since the load is balanced, $I_N = 0$ [4]

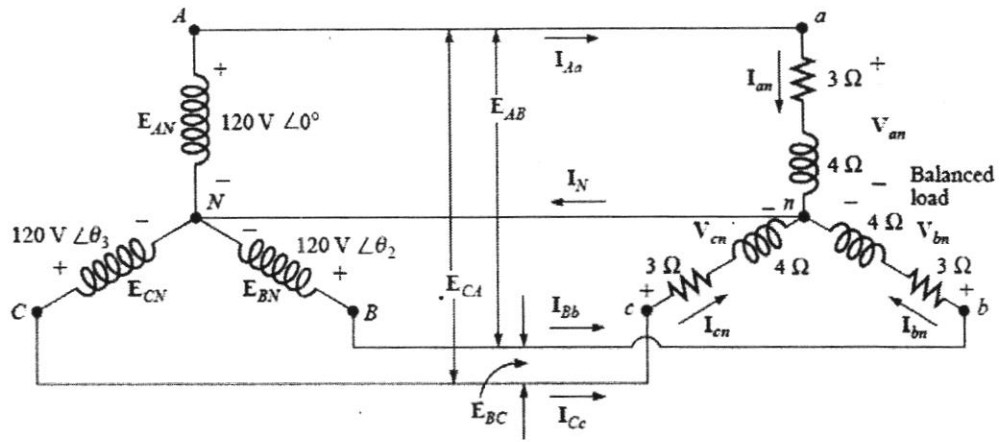


Figure-8