

Reg. No. \_\_\_\_\_

# Karunya University

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

## End Semester Examination – May / June 2009

Subject Title: ELECTRIC CIRCUIT ANALYSIS

Time : 3 hours

Subject Code: EE201

Maximum Marks: 100

### Answer ALL questions

#### PART – A (10 x 1 = 10 MARKS)

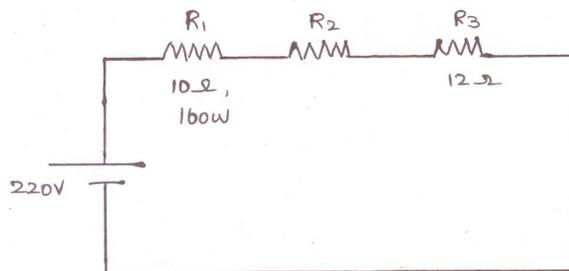
1. Dependent sources are also known as \_\_\_\_\_
2. State True or False: In a pure series electric circuit Kirchoff's voltage law is only applicable.
3. In a pure capacitive circuit current \_\_\_\_\_ the voltage by  $90^\circ$ .
4. Write down the equation of power factor in terms of resistance and impedance.
5. For a circuit with n nodes, we can write \_\_\_\_\_ number of nodal equations.
6. State True or False: current sources are converted into voltage sources in mesh current method.
7. \_\_\_\_\_ theorem is useful when there is change in the value of circuit elements.
8. Express the relationship between Thevenin's voltage and Norton's current.
9. What is the transient current in a series RL circuit with DC excitation?
10. Give the time constant of RC network.

#### PART – B (5 x 3 = 15 MARKS)

11. What are the types of controlled sources?
12. Define Q factor with its expression.
13. The number of turns in an ideal transformer are  $N_1 = 5$  and  $N_2 = 50$ . Determine the primary impedance if the secondary load is  $4 \text{ K } \Omega$ .
14. State Millman's theorem.
15. Write down the conditions for various damping in series RLC circuit with DC excitation.

#### PART – C (5 x 15 = 75 MARKS)

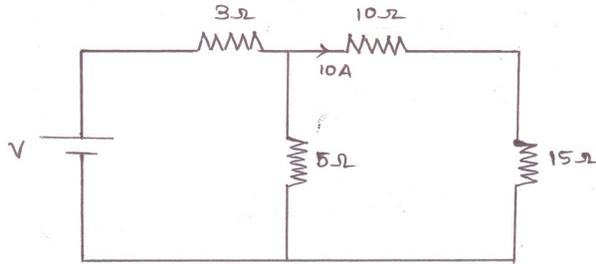
16. a. Obtain the value of resistance  $R_2$  when the power absorbed by  $10 \Omega$  resistance is  $160 \text{ W}$ .(8)



[P.T.O]

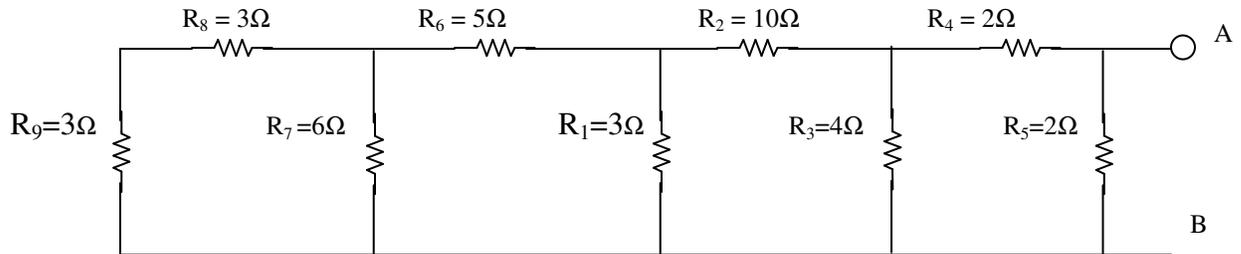
b. Determine the voltage source V.

(7)

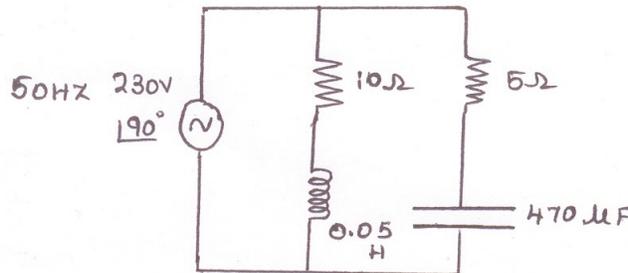


(OR)

17. Find the equivalent resistance across AB.



18. For the network shown, determine a) each arm impedance b) each arm current c) over all current d) over all impedance e) over all power factor f) apparent power g) Active power h) Reactive power

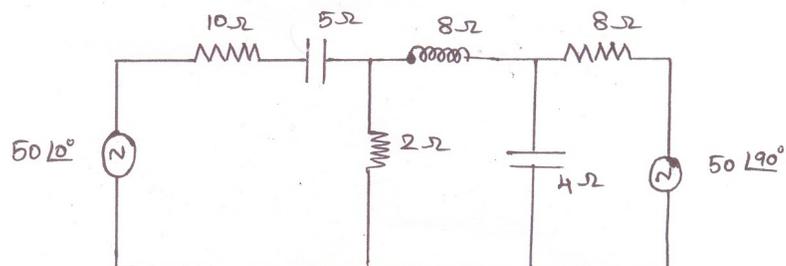


(OR)

19 a. Explain how 3 Φ power can be measured using two wattmeter method with neat circuit diagram. (7)

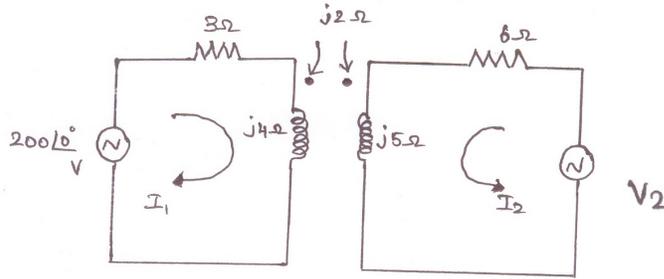
b. A Coil of resistance 50 Ω and inductance 0.2 H is connected in series with a capacitor. The resonant frequency of the circuit is 75 Hz. If the supply voltage is 200V, 60 Hz determine  
 i) circuit impedance at line frequency    ii) Line current    iii) Voltage across the coil  
 iv) voltage across the capacitor    v) power factor (8)

20. Obtain the loop currents for the circuit shown in fig. using mesh current method.

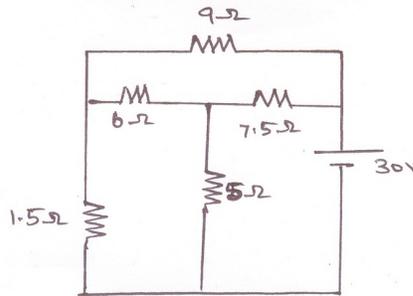


(OR)

21. In the coupled circuit shown find  $V_2$  if  $I_1 = 0$ .

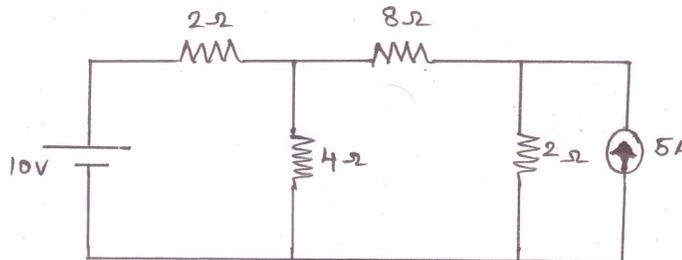


22. Find the current through  $1.5\ \Omega$  resistor using Thevenin's theorem for the circuit shown in fig.

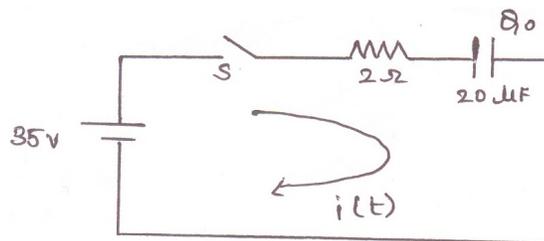


(OR)

23. Find the current through  $8\ \Omega$  resistor shown in circuit diagram using superposition theorem



24. In the circuit shown in figure, the initial charge on the capacitor is  $520\ \mu\text{C}$ . If the switch is closed at  $t = 0$ . Find the circuit current  $i(t)$ .



(OR)

25. Find the transient current of the circuit shown in figure. Assuming zero initial current.

