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

**Karunya University**

**(Karunya Institute of Technology and Sciences)**

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

**Supplementary Examination - June 2011**

**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. What are the lumped elements?

2. Write the VI relationship of a capacitor.

3. What is power factor?

4. Write the expression for the readings of two wattmeters in 3 phase power measurement using two-wattmeter method.

5. What are the basic laws for Mesh and Nodal analysis?

6. What is an ideal transformer?

7. To which circuit the superposition theorem is applicable?

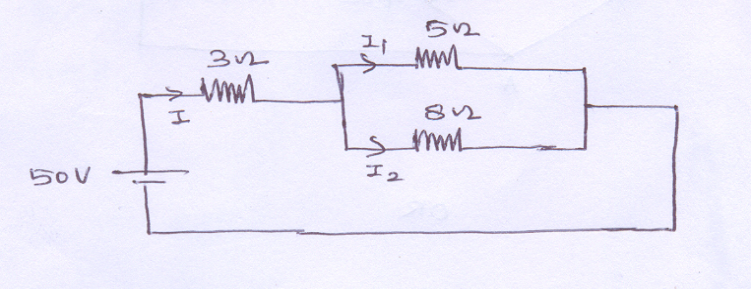
8. Draw the Norton’s equivalent circuit.

9. What is meant by free response of a circuit?

10. Define time constant of RC circuit.

**PART – B (5 x 3 = 15 MARKS)**

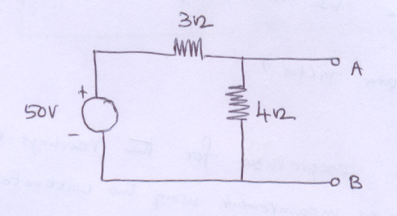
11. Use current division method and find the current flow through all the elements of circuit shown in figure below.



12. Find the impedance and voltage across resistor, if a resistor of 1 kΩ and an inductor of 500mH are connected in series to a source of 10V, 10 kHz.

13. Derive the relationship between mutual inductance and self inductances of two magnetically coupled coils.

14. Determine the Norton’s equivalent circuit between terminals AB for the circuit shown in figure below.

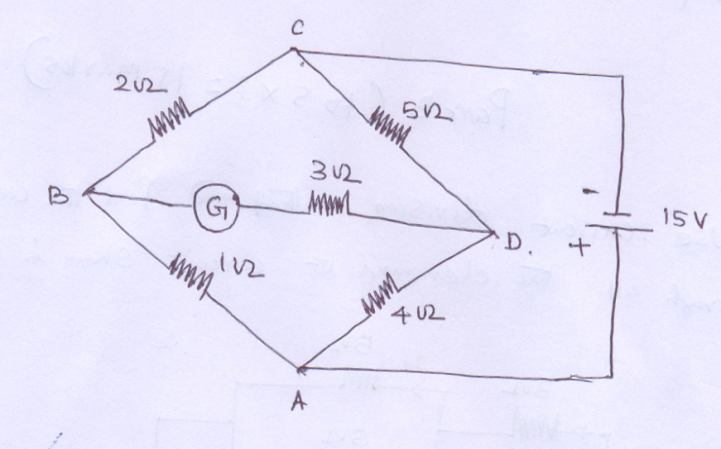


15. Draw the response of RLC circuit with step input for different damping cases.

[P.T.O]

**PART – C (5 x 15 = 75 MARKS)**

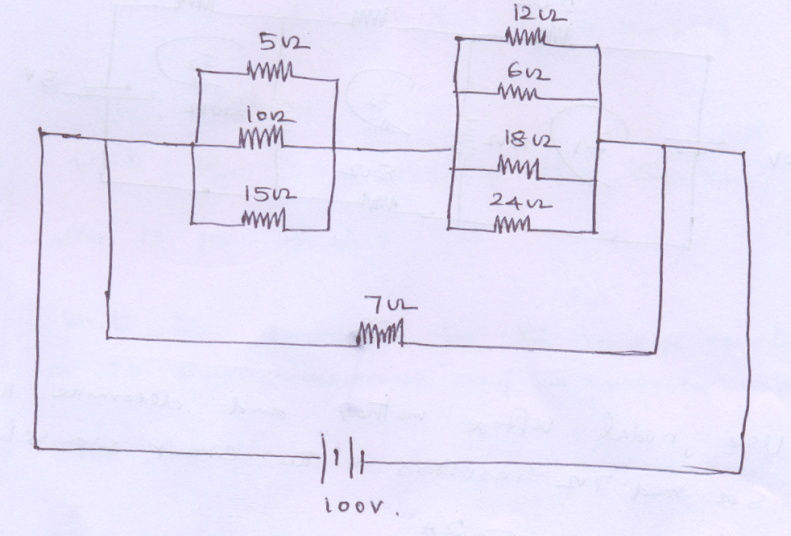
16. Find the current through the galvanometer of internal resistance 3Ω in the unbalanced Wheatstone bridge network shown in figure below. Use Kirchhoff’s laws.



(OR)

17. For the circuit shown in figure below, calculate (a) The total current (b) Current in 5 Ω

(c) the power dissipated in 6 Ω and 7 Ω

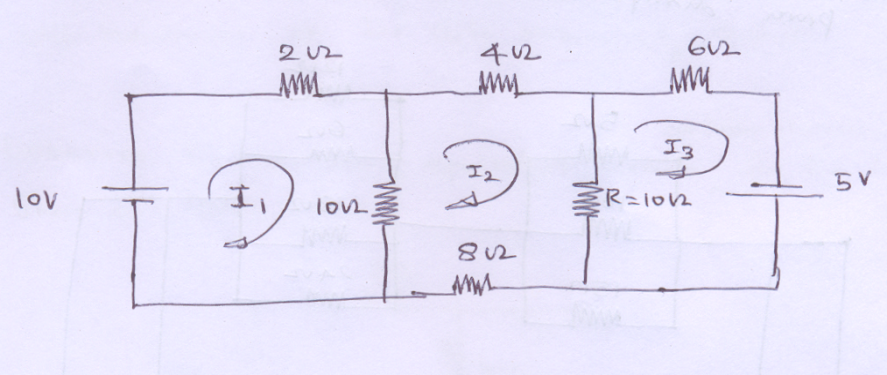


18. A series resonant circuit has the following parameters: resonance frequency = 3.1 x 106 rad/sec, bandwidth = 105 rad/sec, and R = 4 Ω. Calculate L and C of the network, half power frequencies and quality factor.

(OR)

19. In a three phase balanced delta connection with impedance of 4 + j8 Ω is connected across balanced 440V supply. Calculate phase currents, line currents, phase voltages, line voltages and power absorbed by the load.

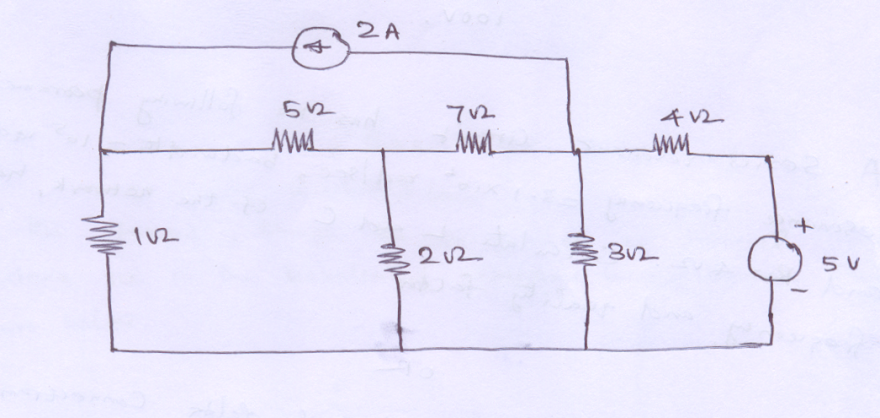
20. Find the loop currents and voltage across R in the network shown in figure below using mesh analysis.



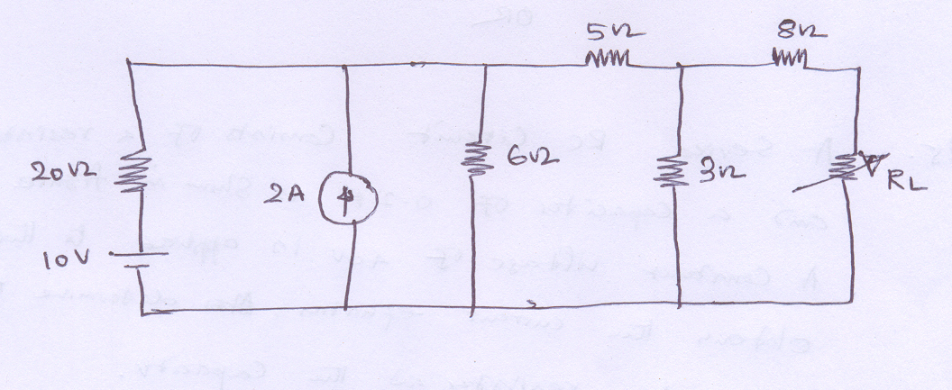
(OR)

[P.T.O]

21. Use nodal voltage method and determine the power in 5 Ω and 7 Ω resistors in the circuit given below.

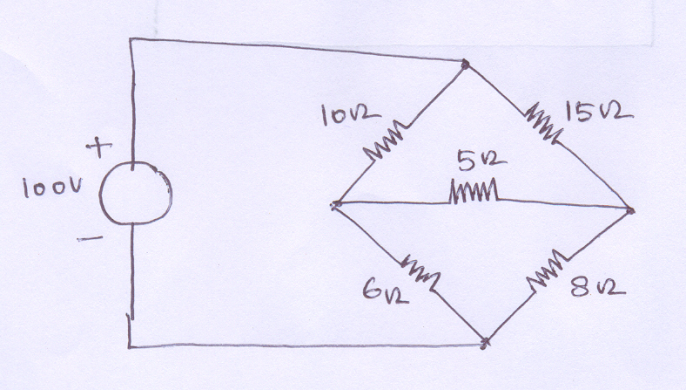


22. Obtain the condition for maximum power transferred to load and also find the maximum power of the circuit given below.



(OR)

23. Use Thevenin’s theorem to find the current through the 5 Ω resistor.



24. Obtain the transient response of a RL series circuit with DC input and explain the significance of time constant.

(OR)

25. A series RC circuit consists of a resistor of 20 Ω and a capacitor of 0.2F as shown in figure below. A constant voltage of 40 V is applied to the circuit at t= 0. Obtain the current equation. Also determine the voltage across the resistor and the capacitor.

