Karunya University

(Karunya Institute of Technology and Sciences)
(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – April/May 2010

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. State Kirchoff's current law.
2. What is a graph?
3. Define quality factor.
4. Draw the phasor representation of current and voltage in a capacitor.
5. What is a super mesh?
6. What is the other name of datum node?
7. Draw Thevenin's equivalent circuit.
8. What is the application of substitution theorem?
9. Write the equation of an exponentially decaying function with an initial value of 10 and time constant 4 sec.
10. Write down the equation of critical resistance in RLC series circuit.

PART – B (5 x 3 = 15 MARKS)

11. Two 50 ohms resistors are connected in series. When a resistor R is connected across one of them, the total circuit resistance is 60 ohms. Calculate the value of R.
12. The power input to a 2000V, 50Hz, 3 phase motor is measured by two wattmeters which indicate 300 kW and 100 kW respectively. Calculate (i) the input power   (ii) power factor   (iii) the line current
13. What is an Ideal transformer?
14. State the superposition theorem.
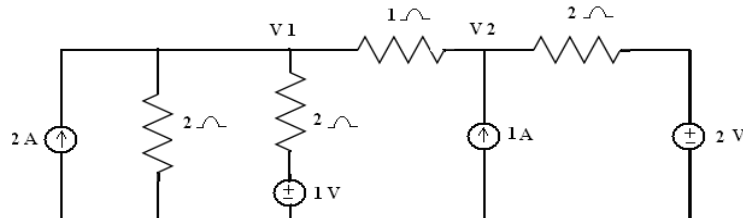15. What is the time constant of RC series circuit?

PART – C (5 x 15 = 75 MARKS)

16. Calculate the resistance between the terminals A-B
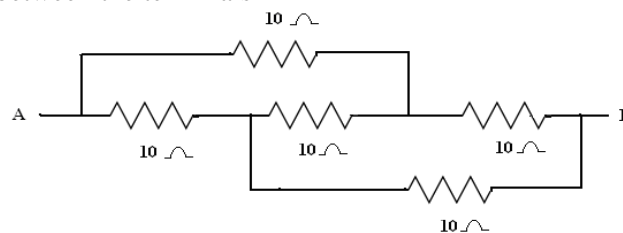
(OR)

17. Using source transformation, find V_1 and V_2 in the Circuit.

18. A series RLC circuit consists of R=100Ω, L=0.02 H and C=0.02µF. Calculate frequency of resonance. A variable frequency sinusoidal voltage of constant rms value of 50 V is applied to the circuit. Find the frequency at which voltage across L and C is maximum. Also calculate voltages across L and C at frequency of resonance. Find the maximum current in the circuit.
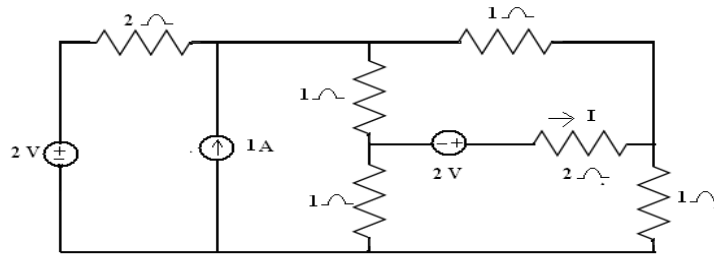
(OR)

19. With the help of neat circuit diagram and phasor diagram, explain how three phase power is measured by two wattmeter method?

20. By nodal analysis, find i_1, i_2, i_3, V_1 and V_2 shown in the figure given below.
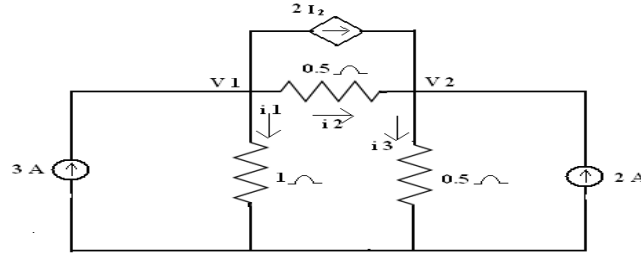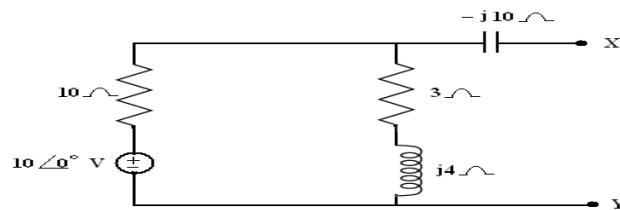

(OR)

21. For the circuit shown in the figure below, find the current I flowing through 2Ω resistance, using loop analysis.
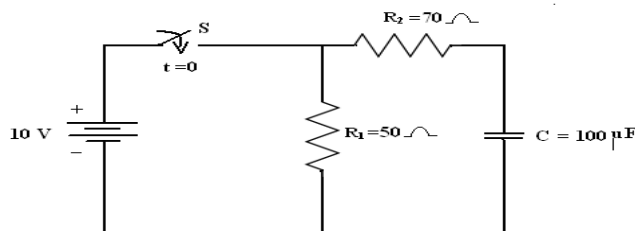

22. Obtain the Thevenin's equivalent of network shown in the figure below, between terminals X and Y.

(OR)

23. With the help of suitable circuit, prove the Norton's Theorem.

24. In the figure shown below the switch S is closed at t = 0. Find the time when the current from the battery reaches to 500mA

(OR)

25. In the network shown in the figure below the switch K is closed and a steady state is reached in the network. At t = 0, the switch is opened. Find an expression for the current in the inductor, i_2 (t).