ANNA UNIVERSITY COIMBATORE

B.E / B.Tech DEGREE EXAMINATIONS JAN / FEB 2009

REGULATIONS - 2007

070280003 / 4EE1201 – CIRCUIT THEORY / ELECTRIC CIRCUIT ANALYSIS

OMMON TO SECOND SEMESTER FULL TIME EEE, ECE, EIE, ICE , BIOMEDICAL, MEDICAL

ELECTRONICS & FIRST SEMESTER PART TIME EEE, ECE)

: 3 HOURS   MAX.MARKS : 100

PART A

(20 x 2 = 40 MARKS)

ANSWER ALL QUESTIONS

State Maximum power transfer theorem.

What is the need for reciprocity theorem.

State and draw Kirchhoff's Current law

Draw the circuit symbol of dependent and independent current sources.

What are the differences between mesh analysis and nodal analysis?

Define 'Q' factor.

What is parallel resonance? What is its significance over series resonance?

What is the average power absorbed by a passive network?

Give the relationship between form factor and peak factor.

0.Three resistors of value 'R' ohms are connected in parallel with the a Voltage source 12V. Find the thevenin equivalent resistance across 12V source.

1.What is the condition of Maximum power transfer in AC circuits?

2.Obtain the relationship between the line and phase quantities of balanced delta load.

3.In the course of measurement of power in three phase circuits the (two) watt meter readings are related as follows. Find the power factor when, W1 = 2W2

4.List any three advantages of using a 4 wire system instead of a 3 wire system

5.Draw the phasor diagram of a three phase system with a balanced load of 0.8 lead.

6.Write the OC forward and reverse transfer impedance in a two port network.

7.Draw the transient response of RL circuit to impulse input voltage

18.what do you mean by mutual induction?

19.What is dot and cross rule.

20.what is the meaning of ABCD parameters.

PART – B

(5 x 12 = 60 MARKS)

ANSWER ANY FIVE QUESTIONS

21.(a)   Find the current through the 5 Ω resistor using Kirchoff equations.   (8)

(b)   Show pictorially why Capacitors and inductors have a phase difference between their voltage and current.   (4)

22.   State thevenin's theorem and Use star-delta transformation to the circuit shown in Fig 1, to find the current through 6.3Ω resistor. All the DC voltage sources have 11V output.   (12)

23.   (a)Use mesh method of analysis to find the current through 4Ω resistor in the circuit shown in Fig 2. All the DC voltage sources have 12V output.   (6)

(b) Derive the expression of resonance frequency for an RL & C parallel circuit.
                                                                                                                    (6)

24.   Find the impedance to be connected to enable a maximum power flow by the AC voltage source connected across AB for the circuit shown in Fig 3. Also find the Maximum power.flow through the 3.2-j4 impedance. All Voltage source have 12-j8 volts output.   (6+6)

25.   a) Prove how three phase power can be measured using two wattmeter's   (6)

b) The power input to a load was measured by two-wattmeter method. The readings were 600W and 400W, the later readings having been obtained by reversing the potential coil connections. Find active and Reactive power and power factor of load.   (6)

26. (a) Find the voltage across 6 Ohms Resistor. (8)

(b) Determine the z-parameters of a T network having: (4)
   Z1 = (2+j5)☐, Z2 =3☐-60☐, Z3 = (3.2+j4.5)☐

27. (a) a three phase balanced delta connected load of (4.3+j7) ohm is connected across a 400V, 3 phase balanced supply. Determine the phase currents and line currents. Assume the RYB sequence. Also calculate the complex power drawn by the load. (6)

(b) Write short note on, average power, apparent power, reactive power and power factor in a balanced three phase system. (6)

28. (i) Consider an RLC series circuit with R=3.2 Ohms, L=1.2 H and C=0.5F.The Circuit is initially relaxed and supplied with a 18V DC source. When a switch between the DC source and RLC is closed at t=0+. Calculate the transient Current and voltage across the capacitor. (ii) replace the 18V source by "10sin60t" source and Calculate the transient Current and voltage across the capacitor.
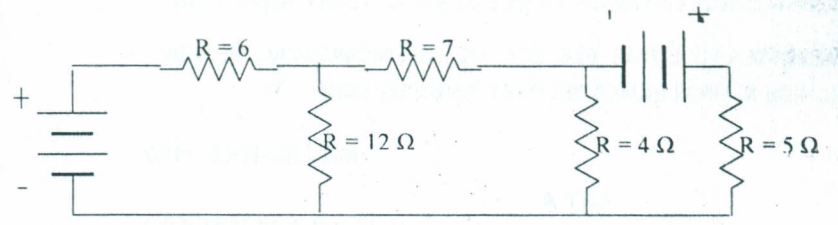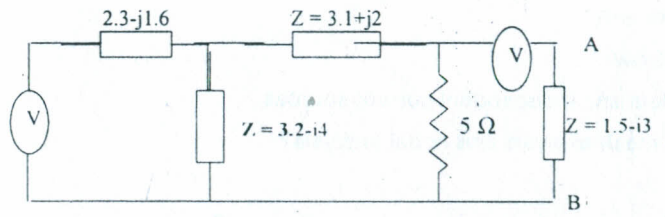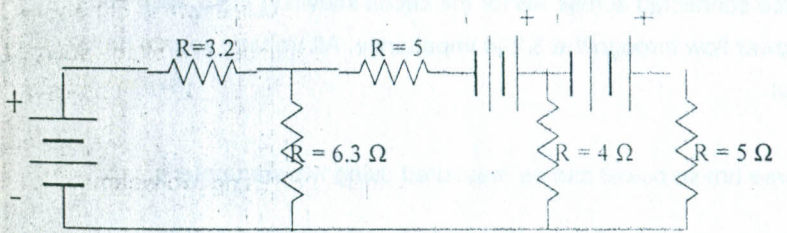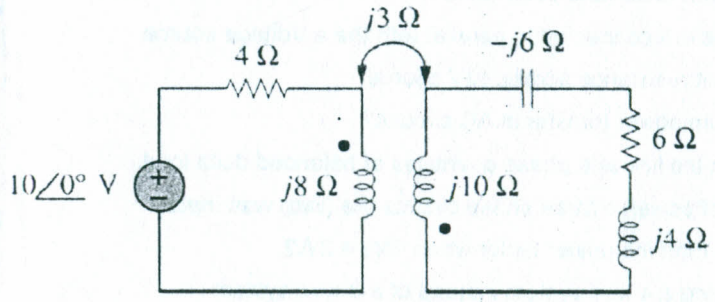

Figure 2

Figure 3

Figure 1

Figure 4

*******THE END*******