B.E / B.Tech (Full time) DEGREE END SEMSESTER EXAMINATIONS, APRIL / MAY 2011
ELECTRICAL AND ELECTRONICS ENGINEERING BRANCH
SECOND SEMESTER
EE 181 – ELECTRIC CIRCUIT ANALYIS
(REGULATIONS 2004)

Time: 3 Hours **Max. Marks: 100**

Answer ALL Questions

PART A **(10 x 2 = 20 Marks)**

1. What do you meant by lumped and distributed elements?
2. Define the term: RMS value
3. A DC voltage of 100 volts is applied to a series RL circuit with R= 25 Ω. What will be the current in the circuit at twice the time constant
4. What do you meant by the term damping ratio?
5. In a RLC series circuit, the applied voltage is 5 V. Drops across the resistance and inductance are 3V and 1 V respectively. Calculate the voltage across the capacitor.
6. Define the term Q factor.
7. Write the Compensation theorem.
8. What are the various steps for the Thevenin's theorem?
9. Define the term co-efficient of coupling.
10. Write the relationship line voltage and phase voltage in star connected systems.

PART B **(5 x 16 = 80 Marks)**

11. (i) Derive the relationships between the resistances for conversion of 3 phase delta connected resistance into equivalent star connected network resistance. (8)

(ii) Reduce the following circuit as shown in Figure 1 to a single source equivalent. (8)

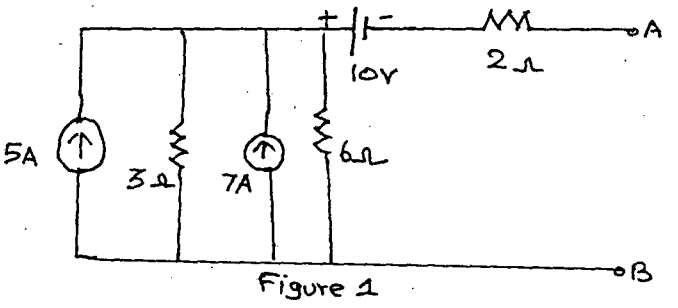


Figure 1

12. (a) What do you meant by natural and forced responses? Explain the concept of RLC transients with step input DC voltage.

(OR)

(b) (i) Find the expression for the transient current and the initial rate of growth of the transient current for the figure 2. (8)

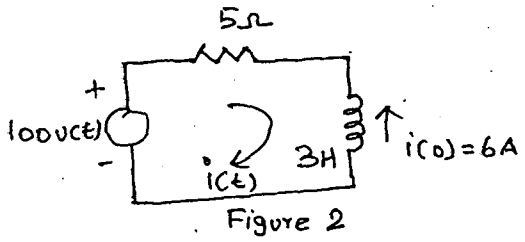


Figure 2

(ii) A resistor is connected across the terminals of a 20 μF capacitor which has been previously charged to a potential difference of 500 V. If the potential difference falls to 300 V in 0.5 min, calculate the resistance in mega ohms. (8)

13. (a) A coil of resistance of 40 Ω and inductance 0.75 H forms a part of a series circuit for which the resonant frequency is 55 Hz. If the supply is 250 V, 50 Hz find (i) the line current (i) power factor (iii) voltage across the coil.

(OR)

(b) Write short notes on:

i) Active power

ii) Reactive power

iii) Apparent power

iv) Power Triangle

14. (a) Write down the steps involved in the mesh analysis. And also determine the voltage V_2 such that the current in the 2+j3 impedance is zero (Figure 3).

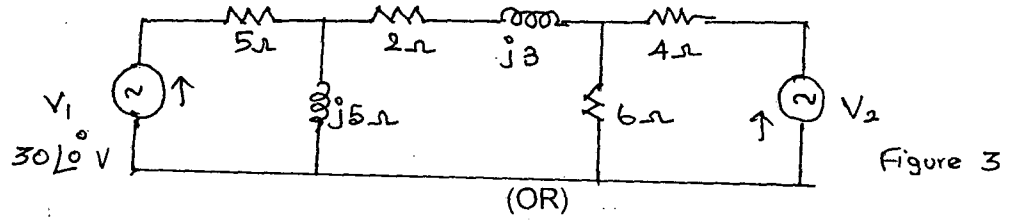
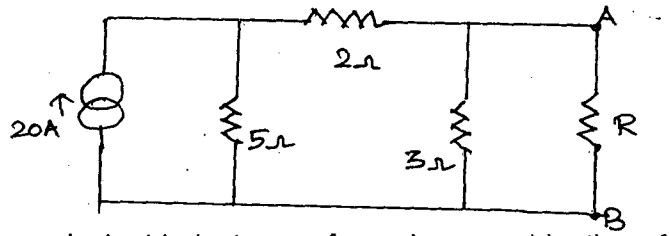


Figure 3

(OR)

(b)The circuit shown in the figure 4, the resistance R absorbs maximum power. Calculate the value of R and maximum power.



15. (a) Derive the equivalent inductances for various combination of conductively connected mutually coupled circuits as shown below.

(i) Series connection (Aiding)

(ii) Series connection (Bucking)

(iii) Parallel combination (Aiding)

(iv) Parallel combination (Parallel)

(OR)

(b) A Three phase delta connected load has Z_{ab} = (100+j0) Ω; Z_{bc} = (-j100) Ω and Z_{ca} = (70.7+j70.7) Ω and is connected to a balanced 3 phase 400 V supply. Determine the line currents in the network.