B.E/ B.Tech DEGREE END SEMESTER EXAMINATIONS, APR/MAY 2012

B.E/ B.Tech (FULL TIME)

ELECTRICAL AND ELECTRONICS ENGINEERING BRANCH

EE - 181/ Electric Circuit Theory

II - SEMESTER (REG: 2004)

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

Answer ALL Questions

Part-A(10*2 =20 Marks)

1. State and explain kirchhoff's voltage law with an example.
2. Convert equal impedances connected in delta connection to star connection.
3. Define time constant of R-L series circuit.
4. State initial and final value theorem.
5. What will be the value of power factor at series resonance condition.
6. Write the expressions for real, reactive and apparent power.
7. Write the nodal equation for the following circuit.(Figure .1)

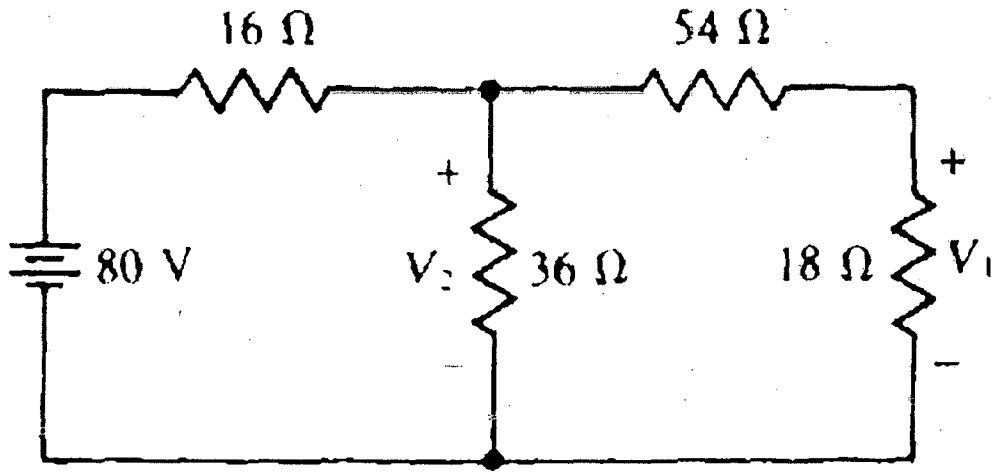

Figure 1.

8. Mention the drawbacks of superposition theorem..
9. Two watt meters in power measurement shows equal values. Find the power factor.
10. Define coefficient of coupling..

Part B-(5*16=80 Mark)

11. (i). Find 'I' using current division.(Figure .2) (16)

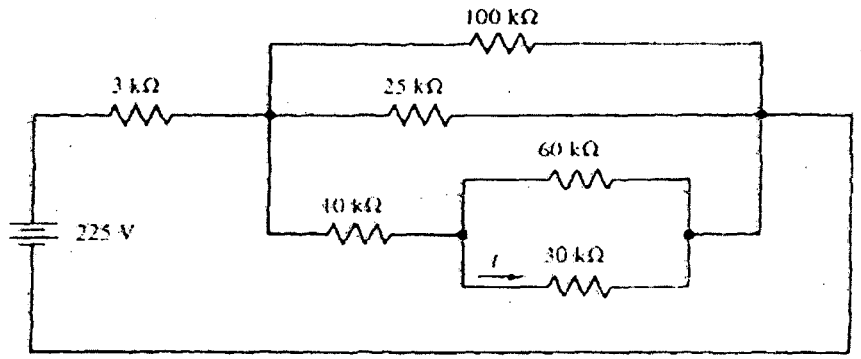

Figure. 2

(ii) Find 'I' using network reduction technique. (Figure 3)

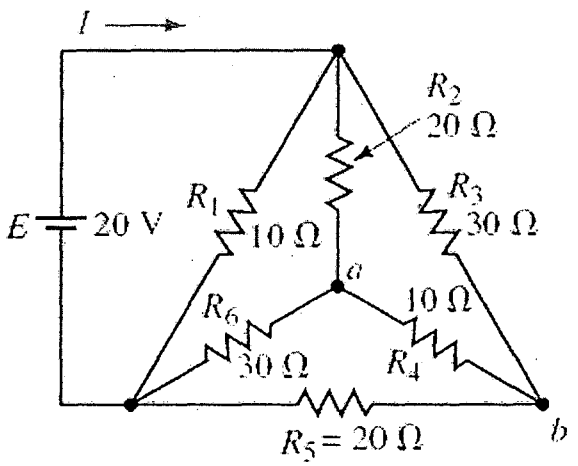

Figure 3.

12.a Find the indicated currents, a long time after the switch has been in position 1. (Figure-4) (16)

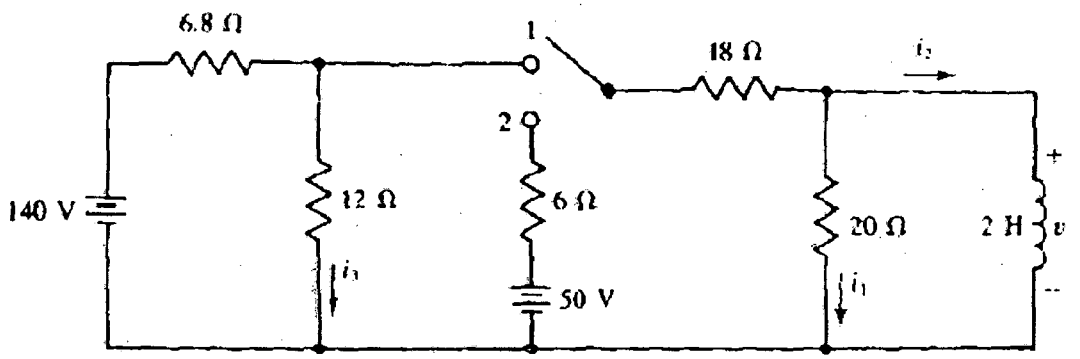

Figure-4

Or

12.b. After a long time in position 1, the switch in the circuit shown in Figure .5 is thrown to position 2 for 2 s. after which it is returned to position 1. Find v for $t \geq 0$ (16)

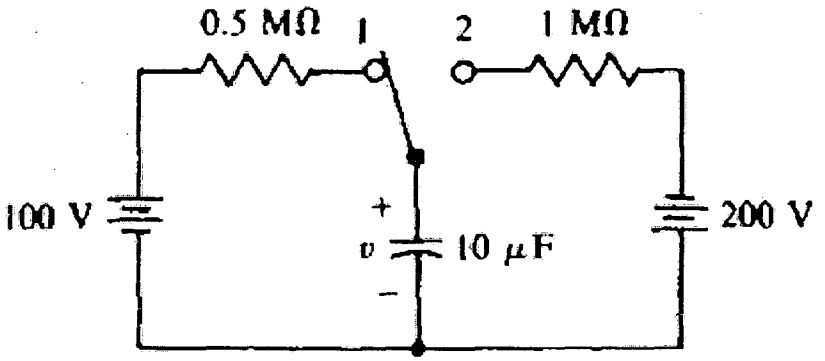

Figure .5

13.a. A **200V, 60Hz** a.c. supply is applied to a coil of **0.06 H** inductance and **2.5 Ω resistance** connected in series with a **6.8 μF** capacitor. Calculate **impedance, current, power factor angle, power factor and power consumed**. [4+4+2+2+4]

Or

13.b Design a series RLC circuit that will resonate at 10KHz,having a bandwidth of 1 kHz and draw 15.3 W from a 200 V generator operating at the resonant frequency of the current. (16)

14.a. Find 'I' using mesh analysis. (Figure.6)

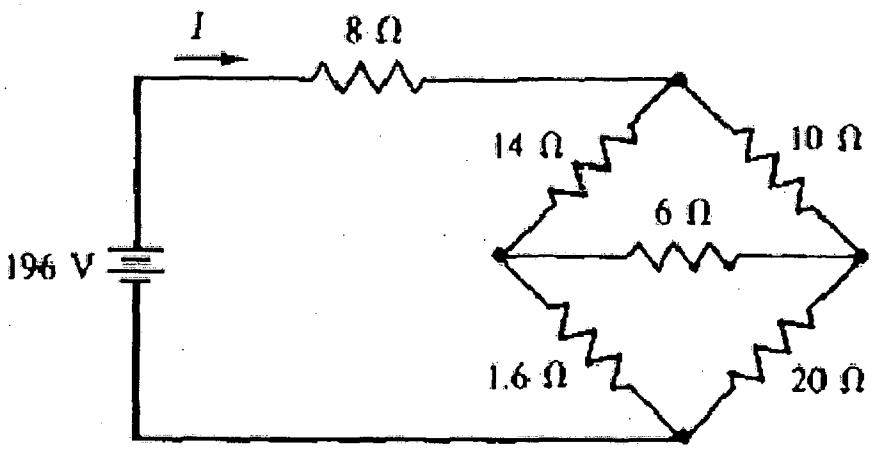

Figure.6

(16)

Or

14.b. Find the Norton's equivalent circuit across the open circuit terminals shown in Figure 7.

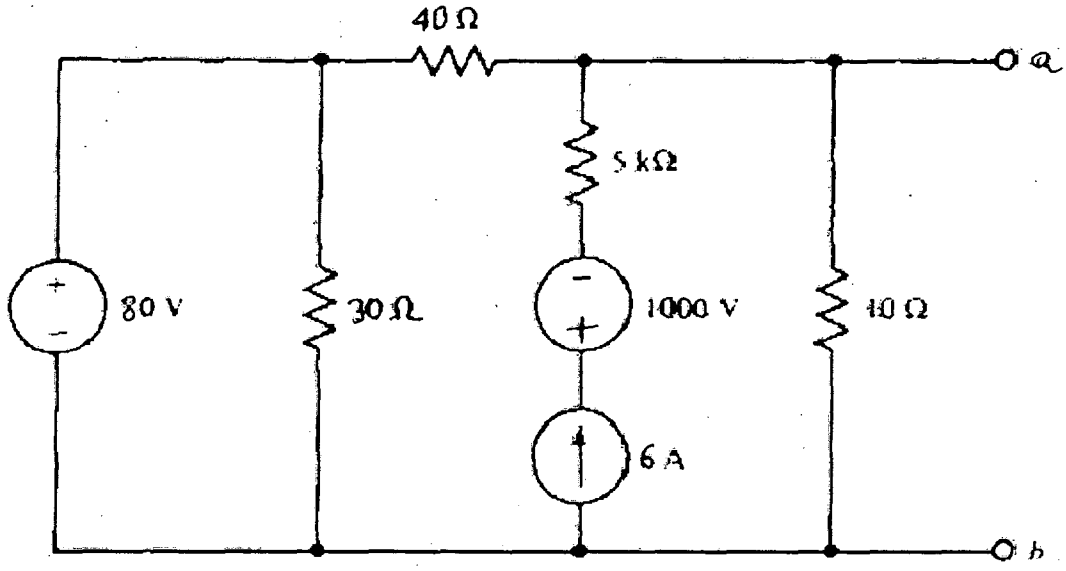

Figure.7 (16)

15.a Prove that the power consumed in delta connected resistive load is greater than star connected resistive load. Assume the value of resistive load as 'R' (16)

Or

15.b. While performing a load test on a three phase induction motor by two watt meter method, the readings on the two watt meters were **16.2 kW** and **- 8.2 kW**. The line voltage was 440 Volts. Determine (i) Total active power drawn by the motor; (ii) Total Reactive power, (iii) Power Factor, (iv)The line current. (4*4=16)