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

B.E- Computer Science Engineering (FULL TIME)

EE - 9262/ Electrical Engineering and Control Systems

IV - SEMESTER (REG: 2008)

41

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. For what value of capacitive reactance the circuit power factor will be unity. Inductive reactance of the circuit is given as five ohms.
3. Why shunt motor is known as constant speed motor?
4. What is meant by voltage regulation?
5. Define transfer function.
6. Explain mason's gain formula.
7. Gain margin for the given system is 20 dB. Comment about the stability of the system.
8. Mention the corner frequency for $(1+j\omega T)$.
9. What are the advantages of state model?
10. Write the solution for the state equation of the given system without input.

Part B-(5*16=80 Mark)

11. Obtain the state model for the following.(Figure .1) (16)

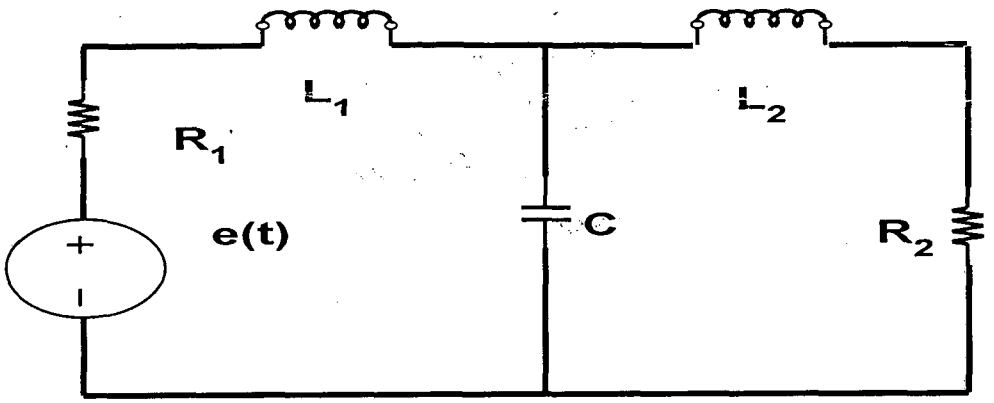

Figure. 1

12.a (i) Derive the EMF equation of DC generator (10)

(ii) An ideal **25KVA** transformer has **500** turns on the primary winding and **40** turns on the secondary winding. The primary is connected to **3000V, 50Hz** supply. Calculate primary current and secondary current on full load , and the maximum core flux. (6)

Or

12.b. Explain double field revolving theory and the operating principles of single phase induction motor. (16)

13.a. Obtain the transfer function using Signal Flow Graph method.(See Figure 2)

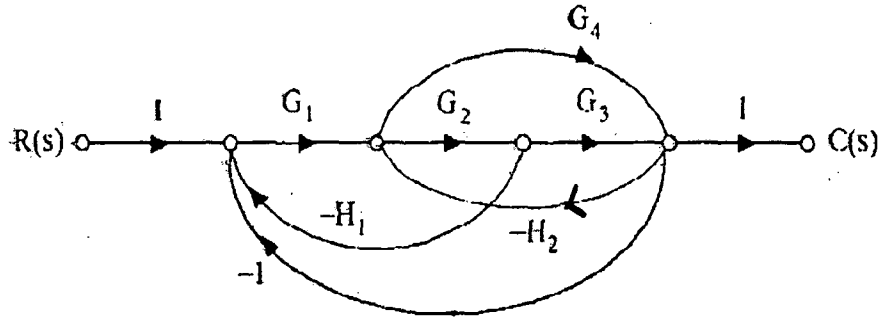

Figure .2 (16)

Or

13.b Obtain C/R using Block diagram reduction. (See Figure 3)

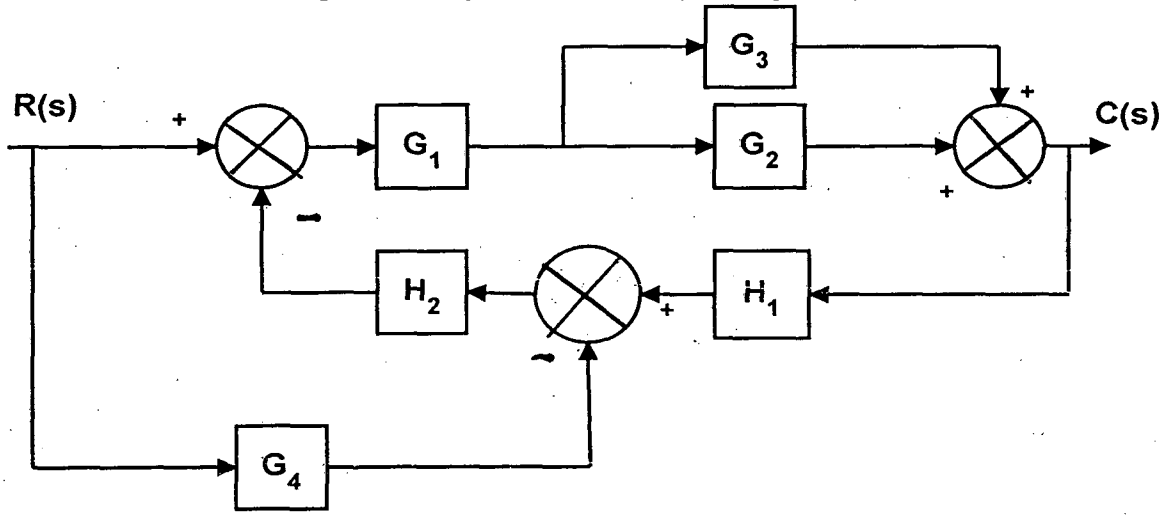

Figure 3 (16)

14.a. Draw the bode plot for the given open loop transfer function G(s)H(s).

$$G(s)H(s)=\frac{35}{s(1+0.5s)(1+0.1s)}$$

Find gain and phase margin also. (16)

Or

14.b. The forward path transfer function of a certain unity negative feedback control system is G(s) . The system is subjected to unit step input. From the transient response curves, it is observed that the system peak overshoot is **20%** and the time at which it occurs is **π/2** seconds. Determine the closed loop transfer function of the system, rise time and time constant of the system. (12+2+2)

15.a (i) Find V_a using nodal analysis (Figure .4) (6)

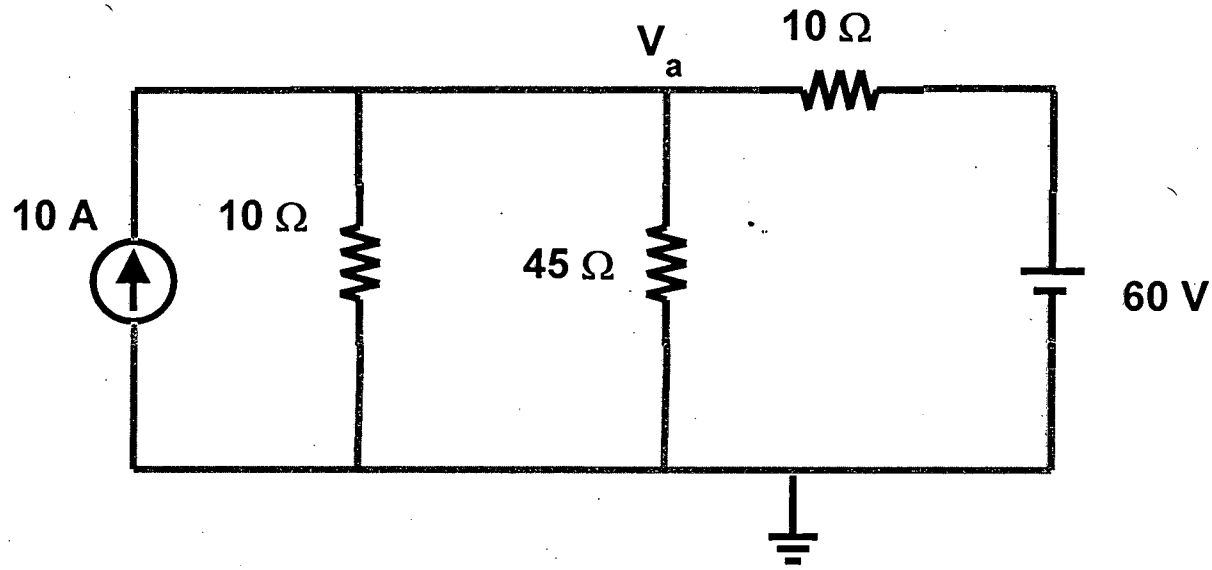

Figure .4

(ii) Find **'i'** using superposition theorem (Figure .5) (10)

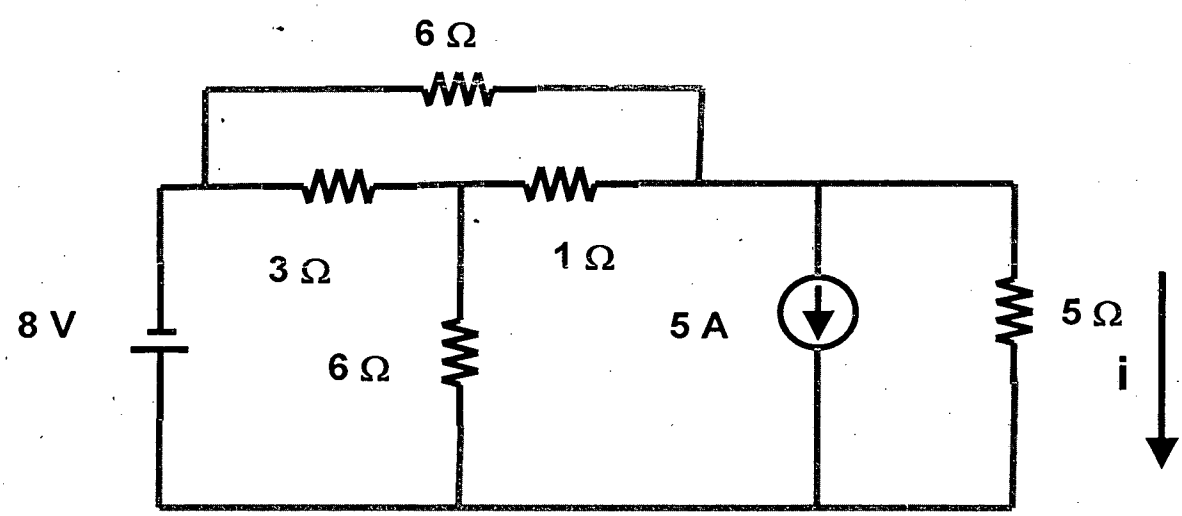

Figure.5

Or

15.b. A **230V, 50Hz** 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]