

I B. Tech II Semester Supplementary Examinations, November - 2021
NETWORK ANALYSIS
 (Com. to ECE, EIE)

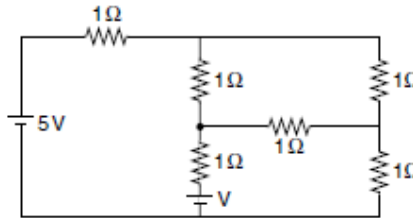
Time: 3 hours

Max. Marks: 75

Answer any five Questions one Question from Each Unit
All Questions Carry Equal Marks

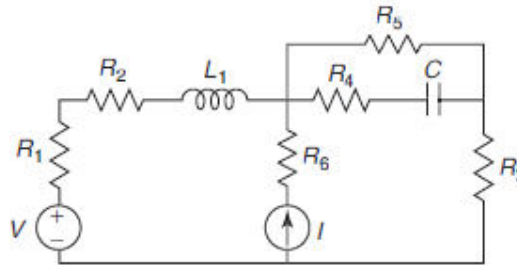
UNIT I

1. a) Explain the following: (8M)
 i) Linear and Non – linear elements ii) Active and passive elements
 iii) unilateral and bilateral Elements iv) lumped and Distributed elements
- b) For the given circuit, the current through 5V source is zero, find the unknown voltage V by using mesh analysis (7M)



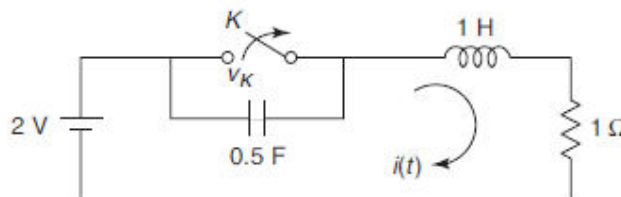
Or

2. a) Explain the following terms: (8M)
 i) Average Value ii) RMS Value iii) Form factor iv) Peak factor
- b) For the following circuit, draw the oriented graph and write the
 i) incidence matrix and ii) tie set matrix (7M)



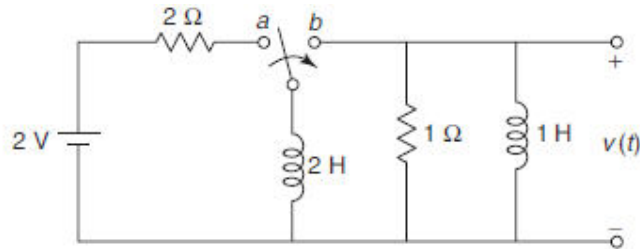
UNIT II

3. a) Explain the significance of initial and final conditions of a network and give these conditions for Resistance, inductance and Capacitance elements. (7M)
- b) The network shown below attains steady state with the switch closed. At $t = 0$, the switch is opened. Find the voltage across the switch V_K and dV_K/dt at $t=0^+$. (7M)



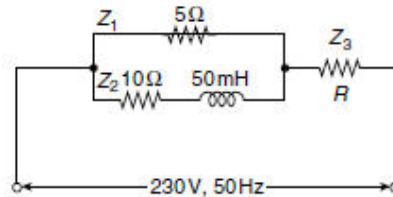
Or

4. a) Derive the Laplace transforms of the following functions: (8M)
 i) Unit – step function ii) Unit ramp function
 iii) Unit impulse function iv) Sine function
- b) The following network was initially in the steady state with the switch in the position a. At $t = 0$, the switch goes from a to b. Find the expression for voltage $v(t)$ for $t > 0$ (7M)



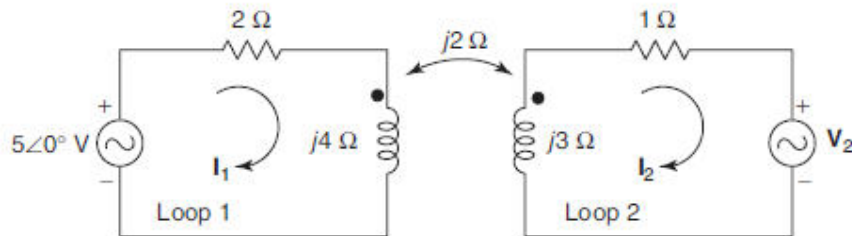
UNIT III

5. a) Explain the step-by-step process of converting Star connected network in to a Delta connected network (8M)
- b) What should be the value of R for which a current of 25 A will flow through it in the circuit shown below. Also find the voltage across inductance. (7M)



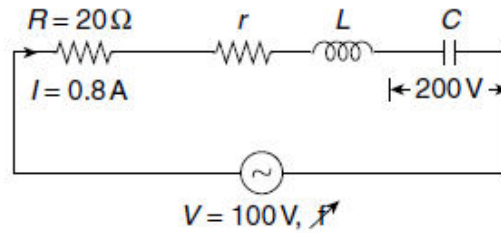
Or

6. a) Explain the following terms w.r.t magnetic circuits: (8M)
 i) Self Inductance ii) Mutual inductance
 iii) Coefficient of Coupling iv) Cumulative and differential Coupling
- b) Find the voltage V_2 in the circuit shown below, such that the current in the loop 1 is zero (7M)



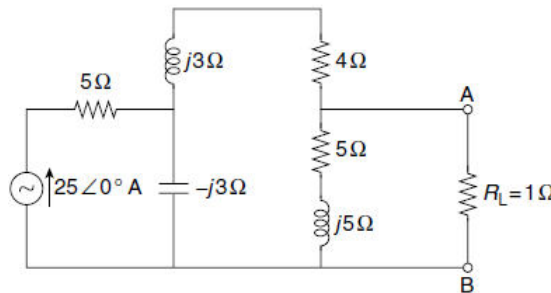
UNIT IV

7. a) Explain the effect of variation of frequency of supply voltage on the current, power factor, and voltage drops in an $R-L-C$ series circuit (7M)
- b) A resistor, an inductor and a capacitor are connected in series across at a 100 V variable frequency supply source, as shown in the following Figure. At a frequency of 250 Hz, the circuit resonates and the current is 1 A. At resonance, the voltage across the capacitor is measured as 200 V. Determine the values of r , L and C . (8M)



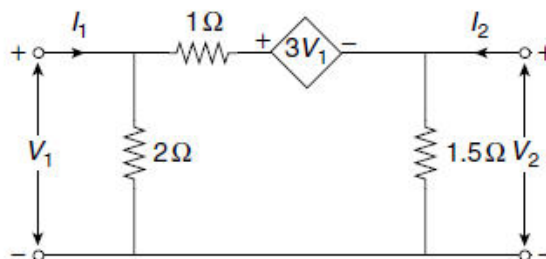
Or

8. a) State and explain Millman's theorem (5M)
- b) Find the current through the load resistance R_L in the following circuit using Norton's theorem (10M)



UNIT V

9. a) Derive the relationship between Impedance and Admittance matrix. (7M)
- b) Calculate the Y – parameters for the network shown below: (8M)



Or

- 10 Find A, B, C and D parameters for the following network: (15M)

