PVP 12

Code: EE3T5

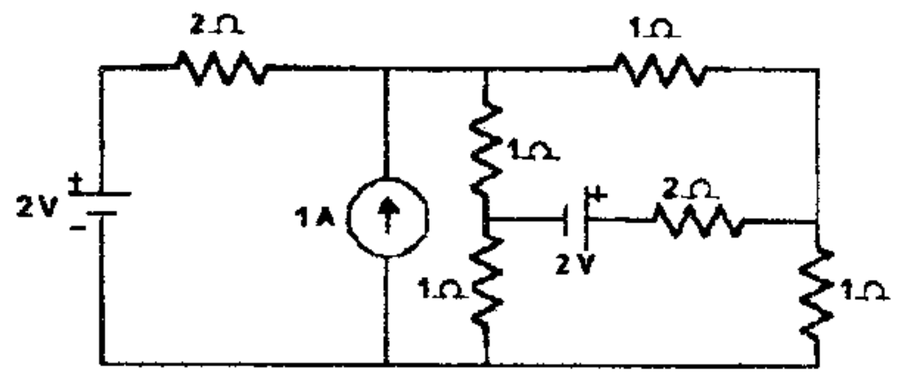
II B.Tech - I Semester – Regular Examinations - January 2014

ELECTRICAL CIRCUIT ANALYSIS - II
(ELECTRICAL & ELECTRONICS ENGINEERING)

Duration: 3 hours Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1 a) For the circuit shown find the current 'I' flowing through 2 ohm resistance using loop analysis. 7 M

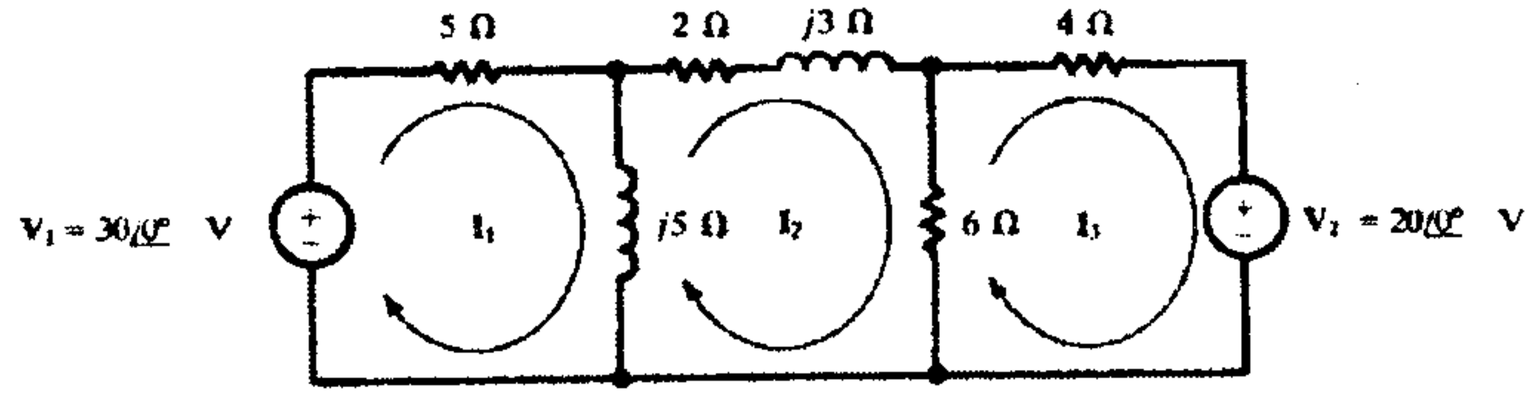


b) For the mesh-current analysis, explain the rules for constructing mesh impedance matrix and solving the matrix equation [Z] I = V. 7 M

2 a) Draw the Locus diagram for series RLC circuits with the help of necessary equations? 7 M

b) A series RLC circuit having a quality factor of 5 at 50 rad / sec. The current flowing through the circuit at resonance is 10A and the supply voltage is 100V. The total impedance of the circuit is 20 ohms. Find the circuit constants? 7 M

3 a) For the network given below, use the mesh current method to find the current in the 2+ j3 impedance due to each of the sources V_1 and V_2. 7 M



b) Prove that Thevenins and Norton's theorems are dual to each other? 7 M

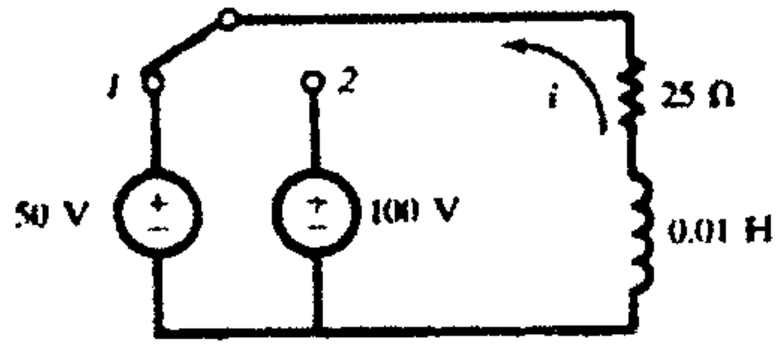
4 a) Derive the relationship between line and phase quantities in a 3-phase balanced,
i) Star connected system and
ii) Delta connected system 7 M

b) A balanced 3-phase Delta connected load absorbs a complex power of 100-kVA with a lagging power factor of 0.8 when the r.m.s line to line voltage is 2400 volts. Calculate the impedance of each arm of Delta connected load. 7 M

5 a) Is two wattmeter method applicable for both balanced and unbalanced 3φ circuits? If yes, prove it. 7 M

b) Explain the effect of power factor on the wattmeter readings in two wattmeter method. 7 M

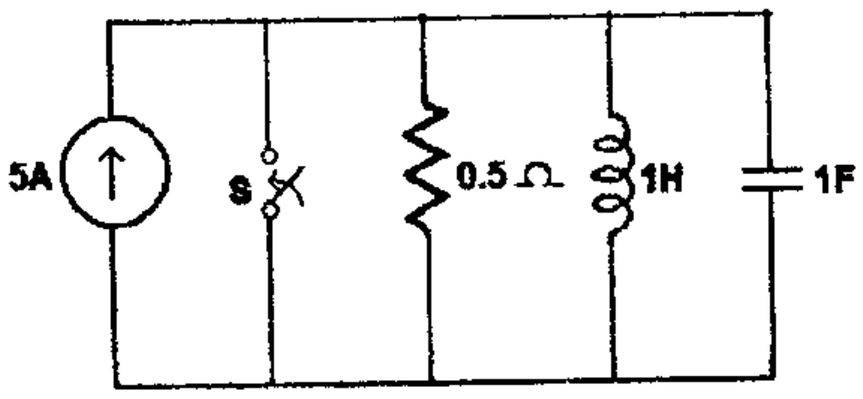
6 a) In the RL circuit shown in below, the switch is in position 1 long enough to establish steady state conditions, and at t=0 it is switched to position 2. Find the resulting current.



7 M

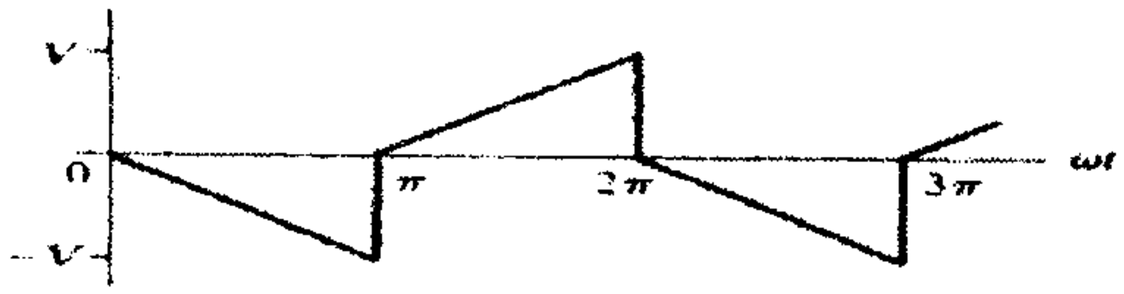
b) A series RC circuit, with R = 1 kilo ohm and C = 20 mF, has an initial charge Q_0 on the capacitor at the time the switch is closed, applying a constant-voltage source V=50V. If the resulting current is $i = 0.075e^{-50t}$ (A), find the charge Q_0 and its polarity? 7 M

7 a) For the circuit shown in figure, find the voltage across the resistor 0.5 ohm when the switch, S is opened at t=0. Assume that there is no charge on the capacitor and no current in the inductor before switching. 7 M



b) Derive an expression for current response of RLC series circuit transient. 7 M

8 a) Find the trigonometric Fourier series of the following wave shown in Fig. below and plot the line spectrum. 7 M



b) Figure below shows a full-wave-rectified sine wave representing the voltage applied to the terminals of an LC series circuit. Use the trigonometric Fourier series to find the voltages across the inductor and the capacitor. 7M