Reg. No. : | | | | | | | | | | |

Question Paper Code: 33403

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2019

Third Semester

Electronics and Communication Engineering

01UEC303 - CIRCUIT THEORY

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

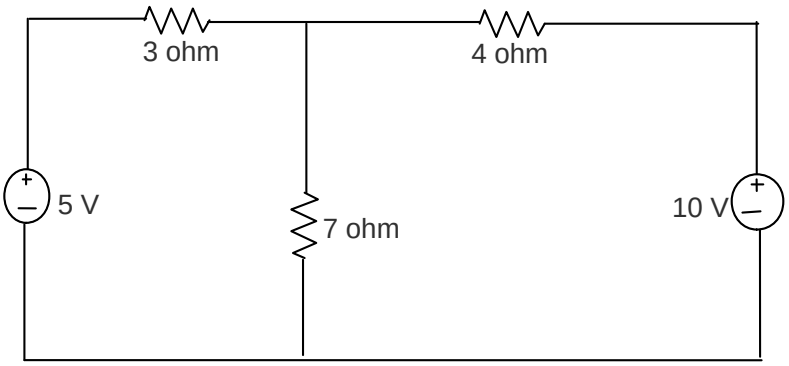
Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

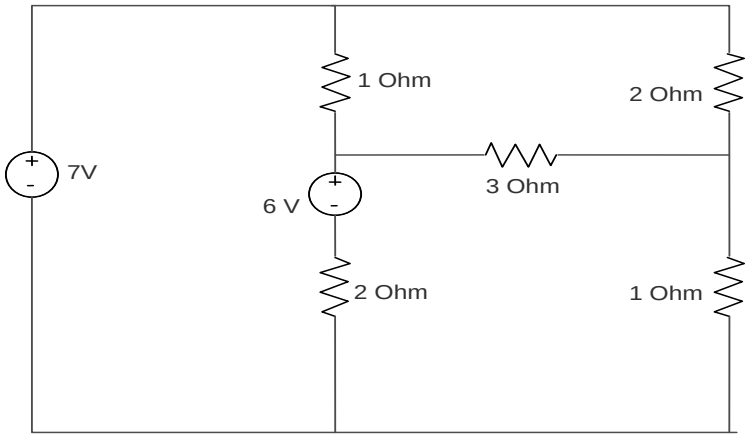
1. Define Kirchoff's current law.
2. Give the properties of tree in a graph.
3. List the applications of Thevenin's theorem.
4. State Norton's theorem.
5. List the characteristics of series resonance
6. Obtain the natural frequency and time constant of an RLC series circuit with R = 1kΩ, L=100 H and C=0.1 μF
7. Give the conditions for balanced star connected load.
8. Give the line and phase values in delta connection?
9. What is impedance matching?
10. Define driving point and transfer point impedance.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Draw the dual network of the given circuit. (6)

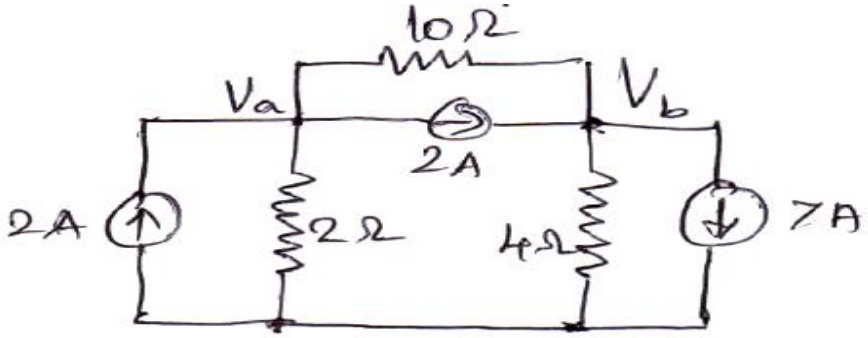


(ii) Determine the mesh currents of the given network using mesh analysis. (10)

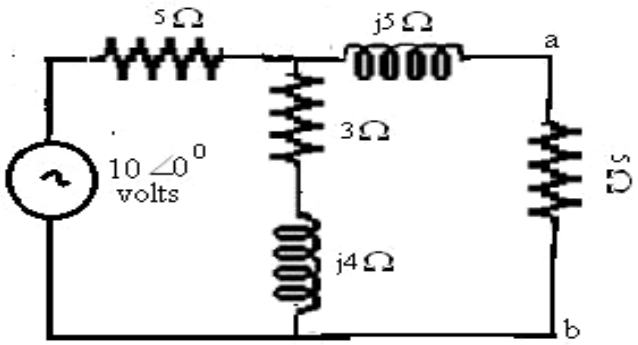


Or

(b) (a) (i) Find the node voltage V_a and V_b which is shown in Figure (16)

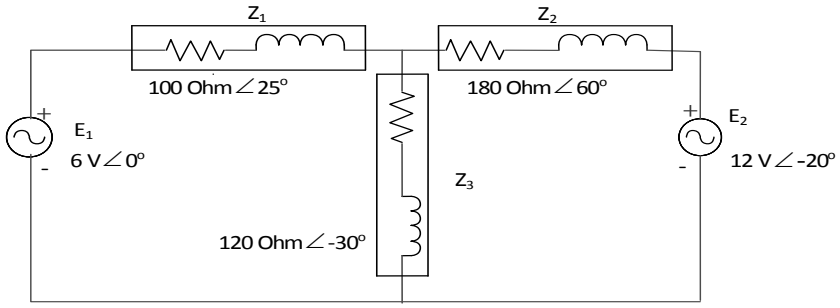


12. (a) State the Thevenin's theorem and find the current through branch a-b of the network shown in below figure. (16)



Or

(b) Using superposition theorem, Analyze the impedance network in the given figure and derive an equation for the current through Z_3. (16)



13. (a) A voltage *v (t)=10 sinωt* is applied to a series RLC circuit. At the resonant frequency of the circuit, the maximum voltage across the capacitor is found to be 500*V*. Moreover the bandwidth is known to be *400 rad/sec* and the impedance at resonance is 100Ω. Find the resonant frequency. Also find the values of *L* and *C* of the circuit. (16)

Or

(b) Express the current response of RL series circuit with an excitation of $V_m \sin\omega t$ and obtain the complete solution. (16)

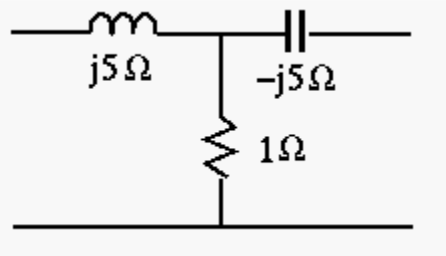
14. (a) (i) Explain the single tuned circuit with neat diagram and obtain the gain and mutual inductance. (10)

(ii) Define mutual inductance and derive the coefficient of coupling. (6)

Or

(b) A three phase balanced Delta connected load of $4 + j8$ is connected across $400V$, 3-phase balanced supply. Find the phase and line currents, also power drawn by the load. (16)

15. (a) Convert the given T-network to a Π network. (16)



Or

(b) Find the h parameter of the network shown in figure (16)