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

Question Paper Code: 31327

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Second Semester

Electrical and Electronics Engineering

01UEE207- ELECTRIC CIRCUITS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

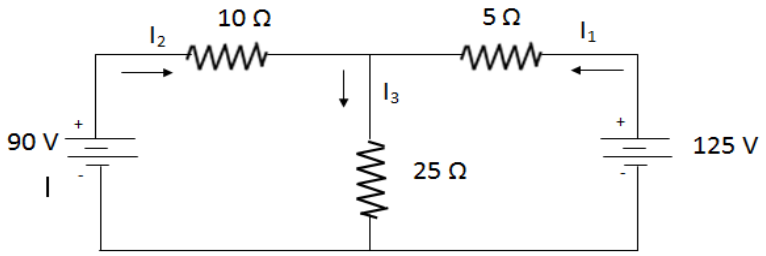
Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Draw the VI characteristics of ideal and practical voltage sources.
2. What are the limitations of Ohm's law.
3. Write the expression for delta to star transformation.
4. State Norton's theorem?
5. Define quality factor Q of a coil.
6. Sketch the frequency response of a single tuned circuit.
7. Write the purpose of Laplace transformation in the circuit analysis.
8. Give the condition for Critical Damping of an RLC series circuit.
9. List out the methods of power measurement in three phase balanced circuits.
10. In three phase power measurement using two wattmeter, what is the power factor if one wattmeter reads zero?

PART - B (5 x 16 = 80 Marks)

11. (a) Calculate the currents supplied by the two batteries in the network shown below.



(16)

Or

(b) Using nodal analysis, calculate the current through the 5 Ω resistor in the circuit shown in figure 2. (16)

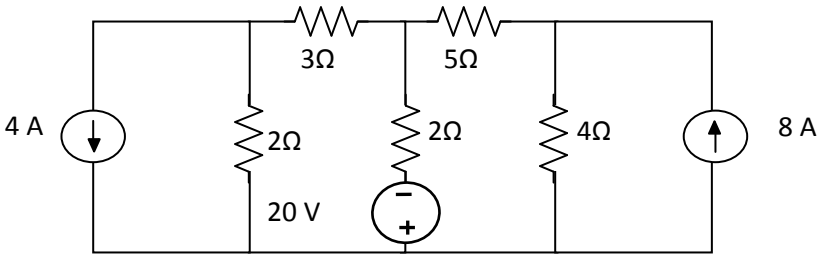
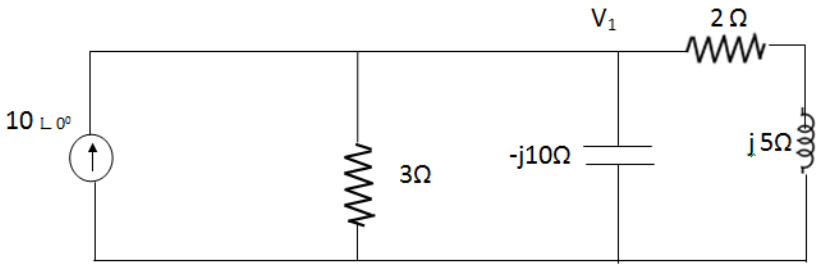


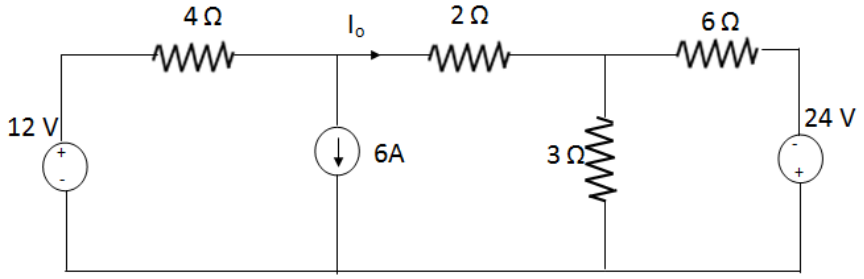
Figure 2

12. (a) Using nodal voltage method, determine the current through various elements in the circuit shown below. (16)

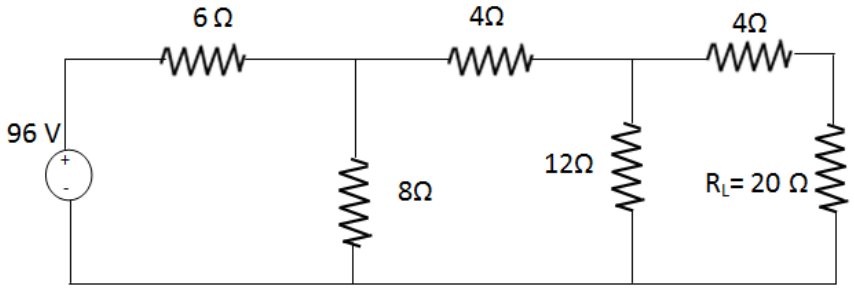


Or

(b) (i) Use source transformation to find I_0 in the circuit shown in figure. (8)



(ii) For the circuit shown in Fig., determine the load current using Thevenin's theorem? (8)



13. (a) A series RLC circuit consists of $R = 16\ \Omega$, $L = 5\ mH$ and $C = 2\ \mu F$. Calculate the quality factor, bandwidth and half power frequencies. (16)

Or

(b) Derive the formula for self inductance, mutual inductance and coefficient of coupling. (16)

14. (a) A RL series circuit is excited by a sinusoidal source $e(t) = 10 \sin 100t$ volts, by closing the switch at $t = 0$. Take $R = 10\ \Omega$ and $L = 0.1\ H$. Determine the current $i(t)$ flowing through the *RL* circuit. (16)

Or

(b) A series RL circuit has R= 25 Ω and L = 5 H. A DC voltage of 100 V is applied at t = 0. Find (i) the equation for current, (ii) voltage across R and L, (iii) the current in the circuit after 0.5 s and (iv) the time at which the voltage drops across R and L are same. (16)

15. (a) A symmetrical three-phase, three wire 440 V, supply is connected to a star-connected load. The Impedances in each branch are $Z_R = 2 + j3\ \Omega$, $Z_Y = 1 - j2\ \Omega$ and $Z_B = 3 + j4\ \Omega$. Find its equivalent delta connected load. (16)

Or

(b) Explain power and power factor measurements in three-phase circuits by two-wattmeter method. (16)
