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

Question Paper Code: 32307

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

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. Define Kirchhoff's law.
2. What are the limitations of Ohm's law.
3. Write some applications of maximum power transfer theorem.
4. Two resistors 10Ω and 20Ω are connected in parallel. If the total current is 3A, what will be the current through each resistor?
5. What is co-efficient of coupling?
6. Sketch the frequency response of a single tuned circuit.
7. Write the purpose of Laplace transformation in the circuit analysis.
8. A RL series circuit with R=10 Ω is excited by a dc voltage source of 30 V by closing the switch at t = 0. Determine the current in the circuit at $t = 2\tau$.
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 (i) the equivalent resistance across the terminals of the supply (ii) total current supplied by the source and (iii) power delivered to 16 Ω resistors in the circuit shown in figure 1.

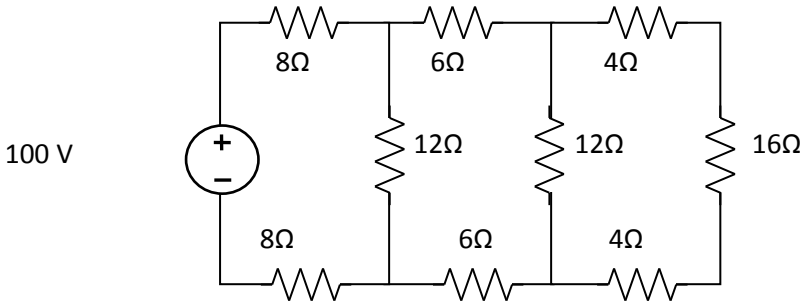


Figure 1

(16)

Or

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

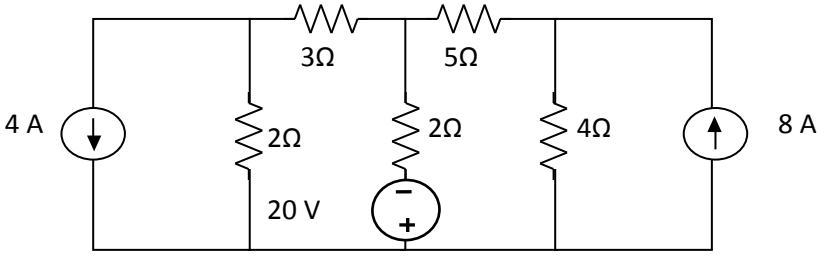
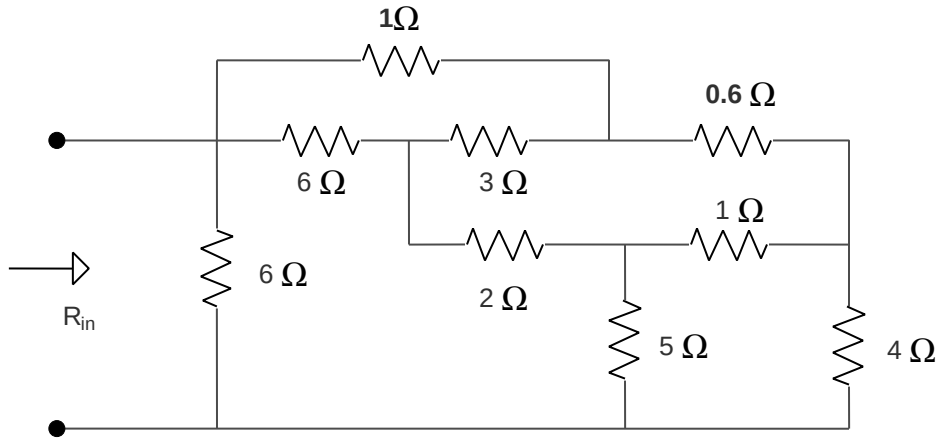


Figure 2

12. (a) Find R_{in} for the network shown in figure, by using Y - Δ and Δ - Y transformations. (16)



Or

(b) (i) Explain how three resistances connected in delta can be converted into equivalent star. Derive the relationship. (8)

(ii) An AC power source 100*V*, 50*Hz* has an internal impedance of 2 + j5 Ω. What will be the maximum power that can be delivered by this source to load? (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) Discuss about Single tuned and Double tuned circuits. (16)

14. (a) Derive the expression for transient response in series R-L-C circuit for DC excitation. Obtain the solution using Laplace transforms. (16)

Or

(b) Derive the expression for transient response in series R-L-C circuit for DC excitation. Obtain the solution using Laplace transforms. (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) A 500 V, three phase motor has an output of 3.73 *kW* and operates at a power factor of 0.85, with an efficiency of 90%. Calculate the reading of each of the two watt meter connected to measure the input. (16)