KUMARAGURU
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Register Number: ……..

B.E DEGREE EXAMINATIONS: NOV/DEC 2014

(Regulation 2009)

Second Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

EEE101: Electric Circuit Analysis

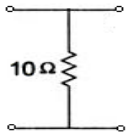
Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. If one of the resistors in a parallel circuit is removed, what happens to the total resistance?
   a) Decreases b) Increases
   c) Remain constant d) Exactly doubles
2. Apparent power is expressed in
   a) Volt-amperes b) Watts
   c) Volt-amperes or Watts d) VAR
3. The nodal method of circuit analysis is based on
   a) KVL and Ohm's law b) KCL and Ohm's law
   c) KVL and KCL d) KVL, KCL and Ohm's law
4. A network has seven nodes and five independent loops. The number of branches in the network is
   a) 13 b) 12
   c) 11 d) 10
5. In a series RLC circuit, $X_C = 150\Omega$, $X_L = 80\Omega$. What is the total reactance? What is the type of reactance?
   a) 70Ω, inductive b) 70Ω, capacitive
   c) 70Ω, resistive d) 150Ω, capacitive
6. What is the phase angle between the capacitor current and the applied voltage in a parallel RC circuit?
   a) 90° b) 0°
   c) 45° d) 180°

7. For single element two port network in circuit, z_{11} =?



a) 0 b) 5

c) 10 d) 20

8. When port 1 of a two- port circuit is short circuited, $I_1=4I_2$ and $V_2 = 0.25I_2$. Which of the following is true?

a) y_{11} =4 b) y_{12} =16

c) y_{21} =16 d) Y_{22} =0.25

9. A 3- phase load is balanced if all the three phases have the same _____

a) impedance b) power factor

c) impedance and power factor d) none of the above

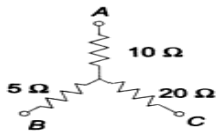
10. In two wattmeter method of measurement, if one of the wattmeters reads zero, then power factor will be

a) zero b) unity

c) 0.5 d) 0.866

PART B (10 x 2 = 20 Marks)

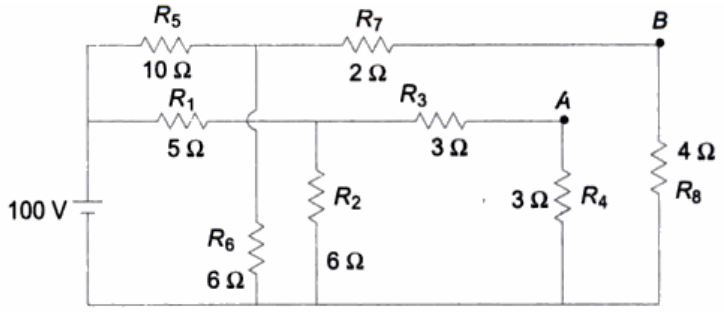
11. State ohm's law and give its limitations.
12. Find the equivalent current source for a voltage source of 100V with series resistance of 2Ω.
13. Obtain the delta-connected equivalent for given circuit.



14. Write the Norton's current equation.
15. Define Coefficient of coupling?
16. State dot rule for coupled circuits.
17. List the one port and two port networks
18. Draw the equivalent circuit of Z parameter**.**
19. What is balanced impedance?
20. Mention the advantages of 3-phase system over 1-phase system.

PART C (5 x 14 = 70 Marks)

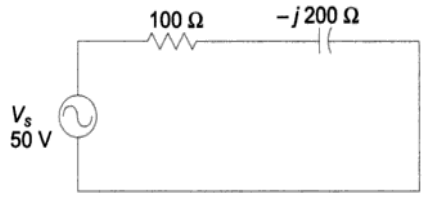
21. a) Determine the voltage across the terminals A and B.



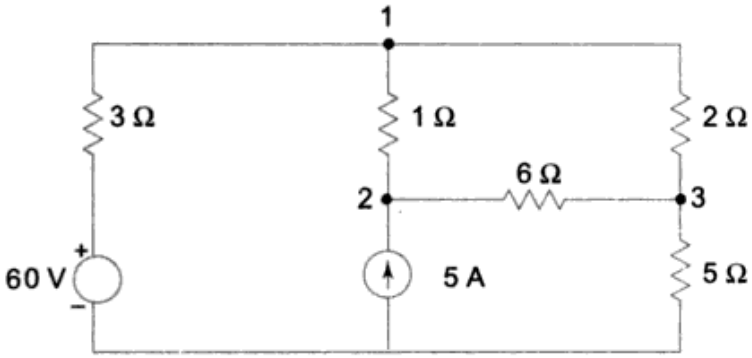
(OR)

b) (i) Derive the total resistance (R_T) expression for series and parallel circuits. (7)

(ii) Determine the power factor, true power, reactive power and apparent power of the circuit. (7)

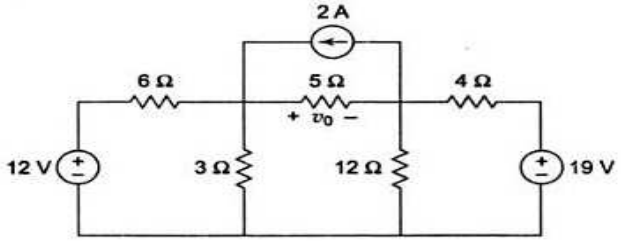


22. a) Use nodal analysis to find the power dissipated in 6Ω resistor.



(OR)

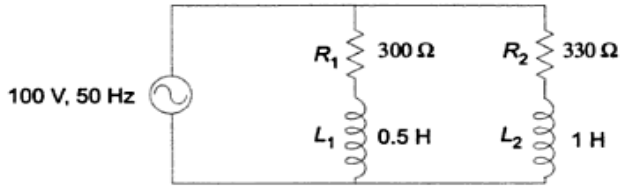
b) Find the voltage across 5Ω resistor using super position theorem.



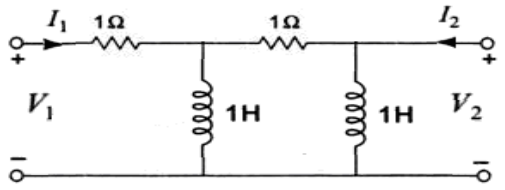
23. a) Derive the current and voltage expression for series RL circuit and draw voltage and current response.

(OR)

b) Determine the voltage across each element of the circuit.

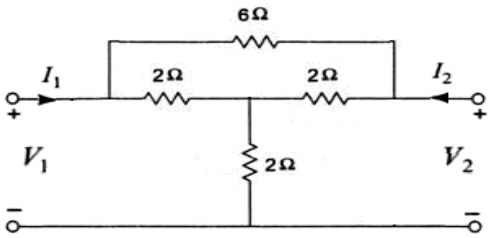


24. a) Find the Z- parameters for the given network.



(OR)

b) Find the Y- parameters for the given network.



25. a) With a neat circuit and phasor diagram explain the three phase power measurement by two wattmeter method and also derive the expression for Power Factor.

(OR)

b) (i) Balanced three phase star connected load with impedance 8+j6 ohm per phase is connected across a symmetrical 400V three phase 50Hz supply. Determine the line current, power factor of the load and total power. (7)

(ii) A Voltage source 100V with resistance of 10 ohms and inductance 50mH, a capacitor 50 microfarad are connected in series. Calculate the impedance when the frequency is a) 50HZ b) 500Hz c) the power factor at 100Hz. (7)

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