Question Paper Code: 50329

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

Second Semester

Electrical and Electronics Engineering

15UEE209 - ELECTRIC CIRCUITS

(Regulation 2015)

Duration: Three hours　　　　　　　　　　　　　　　　　　　　　　Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Kirchhoff's law is applicable to

    (a) AC circuits only　　　　　　　　　　(b) DC circuits only
    (c) AC as well as DC circuits　　　　　　(d) Passive networks only

2. Two resistances are connected in parallel and each dissipates 40 watts. The total power supplied by the source equals

    (a) 40 watts　　　　　(b) 80 watts　　　　　(c) 160 watts　　　　　(d) 20 watts

3. The super position theorem applicable to

    (a) current only　　　　　　　　　　　(b) voltage only
    (c) both current and voltage　　　　　　(d) current, voltage and power

4. A star circuit has each element of resistance $\dfrac{R}{2}$. The equivalent delta elements will be

    (a) R　　　　　(b) 3R　　　　　(c) $\dfrac{3}{2}R$　　　　　(d) $\dfrac{R}{6}$

5. In a parallel resonant circuit, the impedance is

    (a) maximum
    (b) minimum
    (c) equal to difference of inductive and capacitive impedances
   (d) none of these

6. A coil with 1000 turns carrying a current of 8 amps produces a flux of 6×10^{-8} weber. The inductance of the coil will be

    (a) 0.00075 H   (b) 0.0075 H   (c) 0.075 H   (d) 0.75 H

7. A DC voltage V is applied to series RL circuit at time $t = 0$. The current at time t is

    (a) $\frac{V}{R} \varepsilon \, (^{-Rt/L})$
                  (b) $\frac{V}{R} (1 - \varepsilon \, (^{-Rt/L}))$

    (c) $\frac{V}{R} \varepsilon \, (^{Rt/L})$
                  (d) $\frac{V}{R} (1 - \varepsilon \, (^{Rt/L}))$

8. A DC voltage V is applied to series RC circuit at time $t = 0$. The current at time t is equal to

    (a) $\frac{V}{R} \varepsilon \, (^{-t/RC})$
                  (b) $\frac{V}{R} \varepsilon \, (^{t/RC})$

    (c) $\frac{V}{R} (1 - \varepsilon \, (^{-t/RC})$
             (d) $\frac{V}{R} (1 - \varepsilon \, (^{t/RC})$

9. The minimum number of wattmeter required to measure power in a 3 phase unbalanced star connected load is

    (a) four   (b) three   (c) two   (d) one

10. If the power factor of the three phase load is 0.5, then one of the wattmeter will read

    (a) $\frac{\sqrt{3}W}{2}$
           (b) $\frac{W}{\sqrt{3}}$
           (c) $\frac{W}{2}$
           (d) zero

PART - B (5 x 2 = 10 Marks)

11. State ohms law.

12. Define dual networks.

13. What is meant by tuned circuit?

14. What is transient?

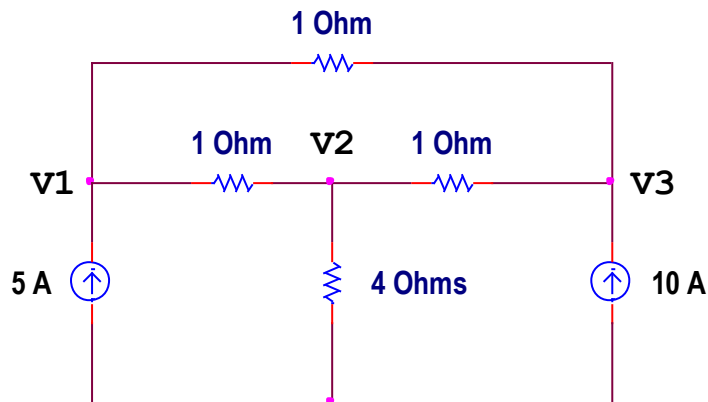15. Give the line and phase values in star connection.

16. (a) Find the current I in the network shown below. (16)
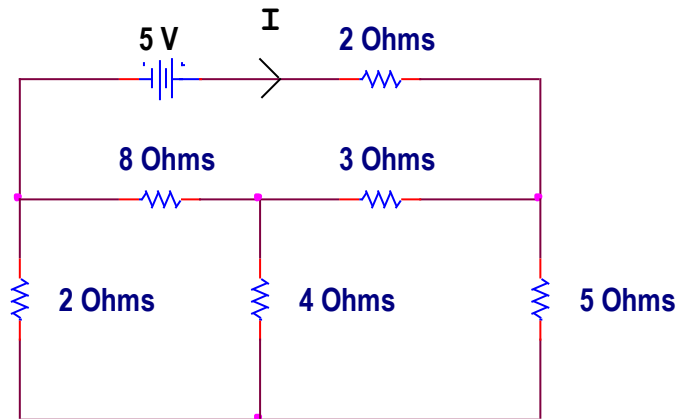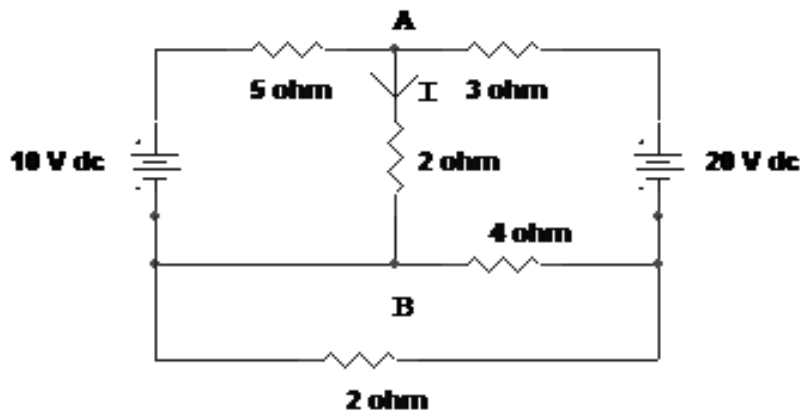

Or

(b) Find the node voltages V1, V2, V3 by the nodal method for the circuit given below. (16)

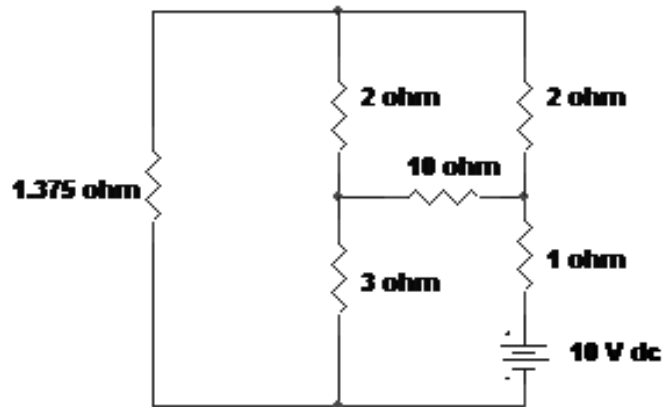17. (a) Find the current in the 2 ohm resistor between A and B for the network using superposition theorem. (16)

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Or

(b) For the circuit shown in the diagram below, find I3 and verify reciprocity theorem. (16)

18. (a) Obtain the expression for self inductance, mutual inductance and coefficient of coupling in magnetic circuit. (16)

Or

(b) Perform the analysis of single tuned coupled circuits. (16)

19. (a) Perform the analysis of RL transient circuit for both rise of current and decaying transient. (16)

Or

(b) A series RLC circuit with R = 300 Ohms, L = 1 Henry and C = 100 x 10^{-6} Farad has a constant voltage of 50 V applied to it at t = 0. Find the value of current. (16)

20. (a) Explain the two wattmeter method of measurement of three phase power with phasor diagram. (16)

Or

(b) Explain the line and phase values of three phase system in both star and delta connection. (16)

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