Register Number: ……………………..

B.E DEGREE EXAMINATIONS: MAY/JUNE 2014

(Regulation 2009)

Second Semester

ELECTRICAL AND ELECTRONCS ENGINEERING

EEE101**:** Electric Circuit Analysis

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

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The number of independent loops for a network with 'n' nodes and 'b' branches is

    a) n-1   b) b+n-1

    c) b-n+1   d) b-n

2. A sinusoidal current has peak value of 12A. What is its average value?

    a) 7.64A   b) 24A

    c) 8.48A   d) 12A

3. Norton's equivalent circuit consists of

    a) current source in series with resistance   b) current source in parallel with an resistance

    c) voltage source in parallel with an   d) voltage source in series with resistance
        resistance

4. The total power in a parallel circuit is 10W. There are five equal value resistors in the circuit.

    How much power does each resistor dissipate?

    a) 10W   b) 2W

    c) 1W   d) 50W

5. What is phase angle of RLC circuit at resonance?

    a) 0^0 b) 90^0

    c) 45^0 d) 30^0

6. If the two port network is reciprocal or symmetrical then

    a) $Z_{12}=Z_{21}$ b) $Z_{11}=Z_{21}$

    c) $Z_{11}=Z_{22}$ d) $Z_{22}=Z_{12}$

7. The parameters are widely used in transmission lines theory

    a) Image parameters   b) H parameters

    c) ABCD parameters   d) Z parameters

8. When the resistance in an RC series circuit is greater than the capacitive reactance, the phase

    angle between the applied voltage and the total current is closer to _____ degree

    a) 90   b) 0

    c) 45   d) 120

9. In two wattmeter method of power measurement, when one wattmeter reads zero and the other

    wattmeter gives positive reading. Then the power factor is

    a) 0.5   b) Zero

    c) Unity   d) 0.8

10. The maximum value of coefficient of coupling is _____

    a) 100 %   b) More than 100 %

    c) 90 %   d) 20 %

PART B (10 x 2 = 20 Marks)

11. State the limitations of ohms law

12. Give the relation between apparent power, average power and reactive power.

13. State Reciprocity Theorem

14. Define power factor.

15. Write the dot rules for coupled circuits.

16. Distinguish between self and mutual inductances.

17. Define time constant of a series RL circuit.

18. Define transfer admittance.

19. Express Z parameters in terms of Y parameters.

20. What is a graph of a network?

PART C (5 x 14 = 70 Marks)

21. a) (i)   A 100 V, 60 W lamp is connected in series with a 100 V, 100 W lamp across   (7)
             200 V supply. What will be the current drawn by the lamps? What will be the
             power consumed by each lamp and will such combination work?

        (ii) A series RL circuit with R=25 ohms and L=0.02H is connected to a 250V, 50Hz   (7)
              source. Calculate (a) the impedance (b) current (c) power and (d) power factor.

(OR)

   b) (i)   Determine the potential difference V_{AB} for the given network   (7)
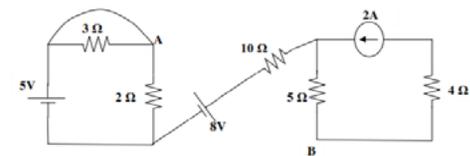
(ii) A unity power factor load of 3000watts is connected in parallel with a load of (7) 2700watts operating at a lagging power of 0.6. If the supply voltage is 150 volts, Calculate current in each load, the total current, total power and power factor

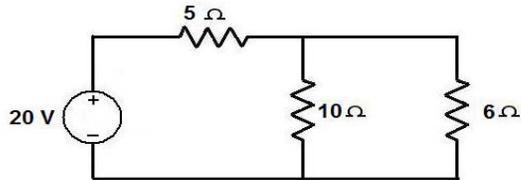22. a) (i) Find current flows through 3 ohm resistor using super position principle. (7)
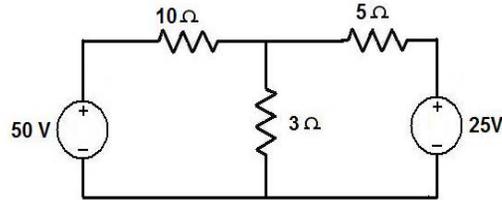
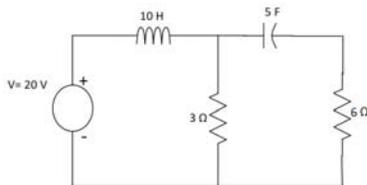(ii) Determine the load current I_L using Norton's Theorem. (7)
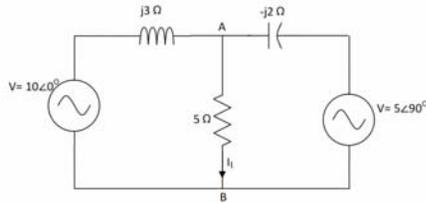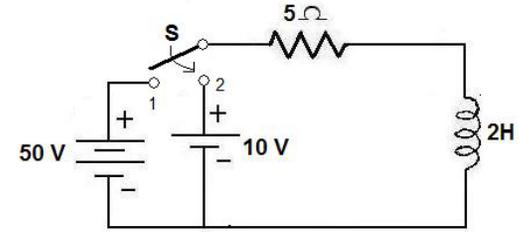

(OR)

b) (i) For the circuit shown below, determine the current flows through 6 ohm by (7) using Thevenin's theorem.

(ii) Draw the Dual for the network given below. (7)

23. a) In the circuit shown in figure, switch S is in position 1 for a long time and brought to position 2 at time t=0. Determine the circuit current.

(OR)

b) Explain the principle of series resonant circuit and derive the expressions for resonant frequency, upper and lower cutoff frequencies, and quality factor.

24. a) Derive an expression for image impedances of two port network.

(OR)

b) Derive the expressions for the Z parameters for T network

25. a) A 400V, three phase balanced source is connected to an unbalanced delta connected impedances of $Z_{ab}= 10 \angle 45\cdot$, $Z_{bc}= 10\angle 0\cdot$ and $z_{ca}= 10\angle -45\cdot$. Determine the line currents, phase currents and total power.

(OR)

b) (i) Explain the three phase power measurement by two wattmeter method in detail. (10)

(ii) Calculate the total power input and the readings of the two watt meters (4) connected to measure power in a three phase balanced load, if the reactive power input is 15 KVAR and the load power factor is 0.8.

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