SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
(AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : Electrical Circuits(16EE201) **Course & Branch**: B.Tech - EEE

Year & Sem: I-B.Tech & II-Sem **Regulation:** R16

UNIT –I

INTRODUCTION

1. Answer the following:

   (a) Define the following: (i) Resistance (ii) Conductance [L1] [2M]

   (b) State Ohm's Law? Also write the limitations of Ohm's Law? [L1] [2M]

   (c) Define the following: (a) Power (b) Energy [L1] [2M]

   (d) Define the following: (a) Inductance (b) Capacitance [L1] [2M]

   (e) State Kirchoff's Laws? [L1] [2M]

2. Derive the expression for Delta connected resistances in terms of Star connected resistances? [L3] [10M]

3. What are the types of sources? Explain them with suitable diagrams and Characteristics?

4. Find the current in the 5Ω resistor in the network shown in figure (1) [L3] [10M]

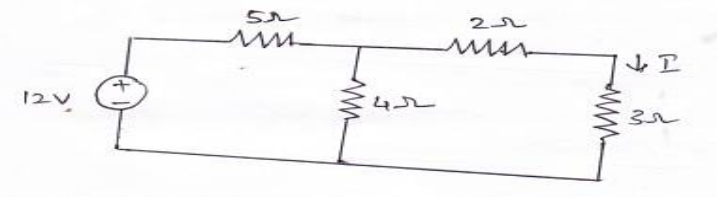

Fig. (1)

5. Derive an expression for total resistance when three resistances R_1, R_2 & R_3 are connected in Parallel? [L3] [10M]

6. Find the equivalent resistance across the terminals A and B of the network shown in fig (2) using Star-delta transformation. [L3] [10M]

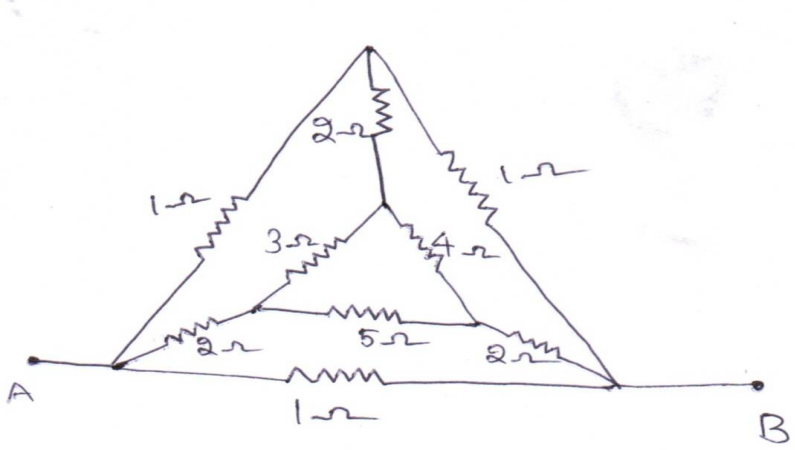

Fig. (2)

7. Find the current passing through each resistor for the circuit below in fig (3). [L3] [10M]

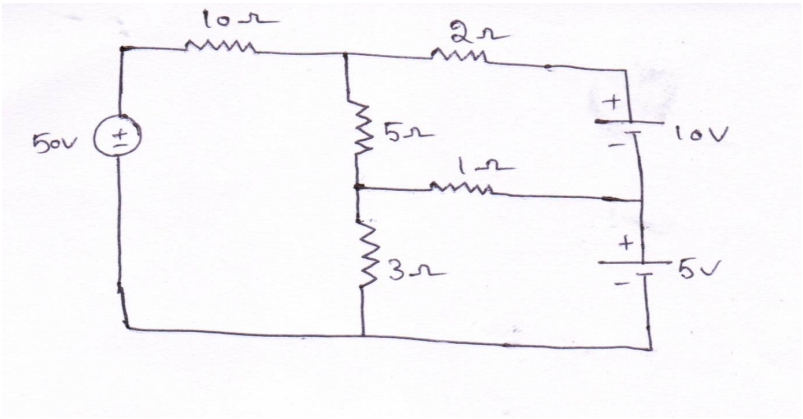

Fig. (3)

8. Determine the current in the 5Ω resistor in the network given in figure (4). [L3] [10M]

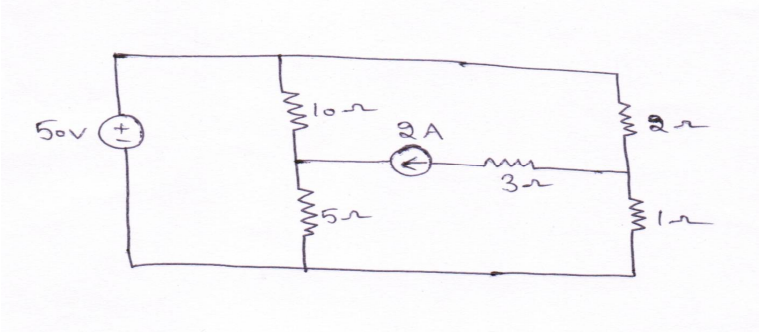

Fig. (4)

9. Determine the voltages at each node for the circuit shown in figure (5). [L3] [10M]

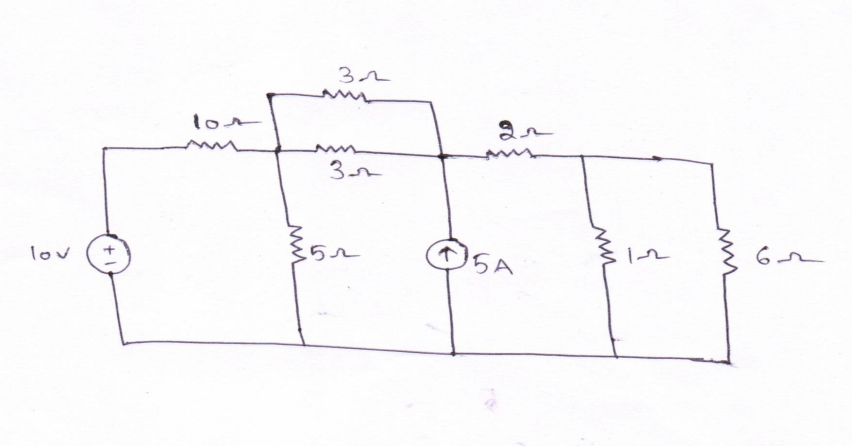

Fig. (5)

10. Determine the current in the 5Ω resistor in the network given in figure (6). [L3] [10M]

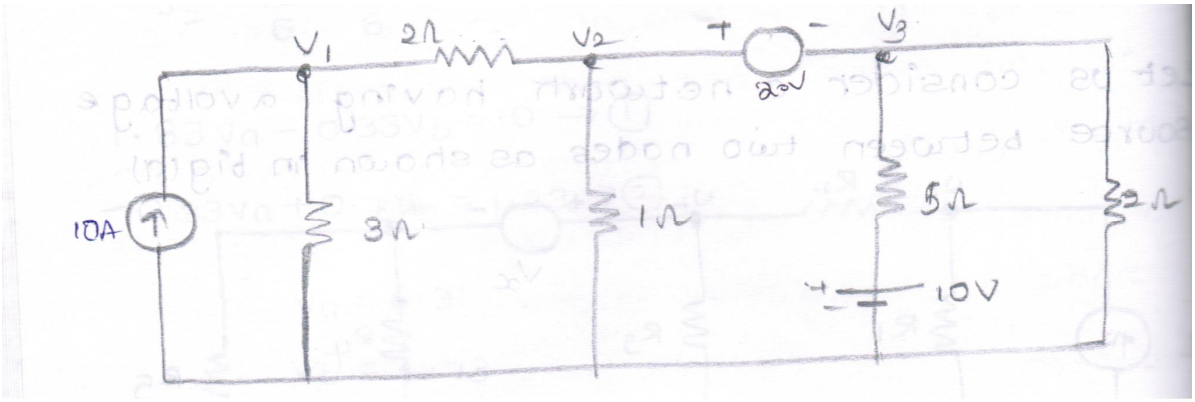

Fig. (6)

11. Write the node equations by inspection method for the circuit shown below in figure (7).

[L3] [10M]

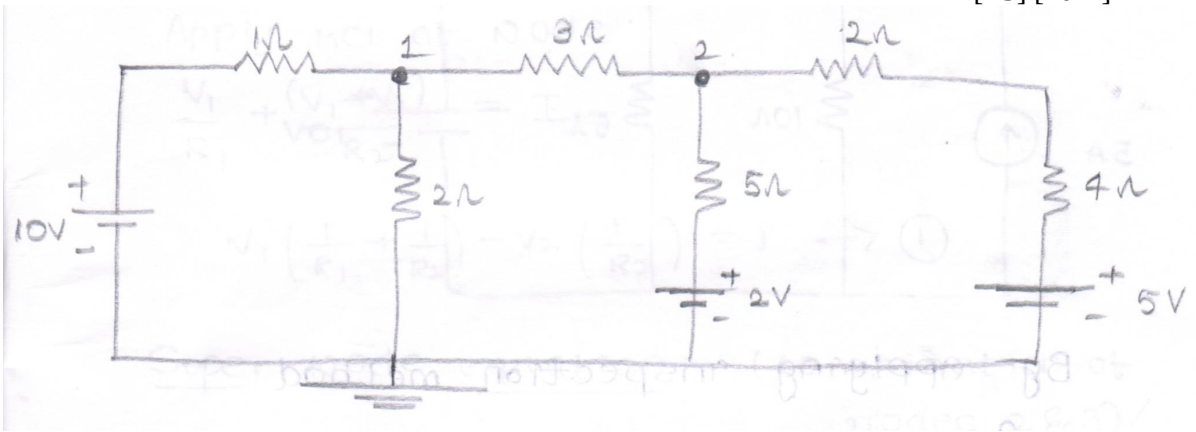

Fig. (7)

12. Derive an expression for total resistance when three resistances R_1, R_2 & R_3 are connected in Series? [L3] [10M]

.

SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
(AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : Electrical Circuits(16EE201) **Course & Branch**: B.Tech - EEE

Year & Sem: I-B.Tech & II-Sem **Regulation:** R16

UNIT-II

AC CIRCUITS

1. Determine the average value, RMS value, Form factor and peak factor of a pure sinusoidal Waveform? [L2] [10M]

2. Find the average value and RMS value of a full wave rectified sine wave. [L1] [10M]

3. Find the form factor of the half wave rectified sine wave shown in fig(A): [L1] [10M]

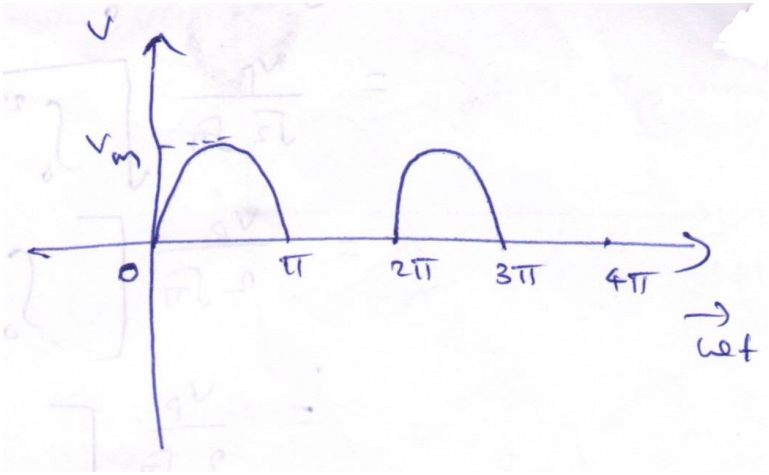

Fig. (A)

4. The full wave rectified sine wave shown in fig (B) has a delay angle of 60. Calculate the average value and RMS value? [L2] [10M]

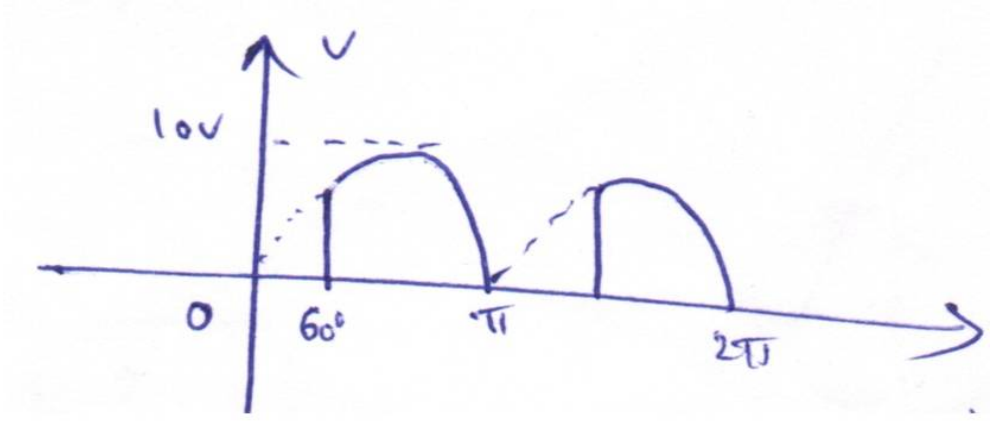

Fig. (B)

5. A 1KΩ resistor is connected in series with an inductance of 50mH across a 230V, 50HZ AC Supply. Find (a) Inductive reactance (b) Impedance (c) Current (d) Phase angle (e) Voltage drop across resistance (f) Voltage drop across Inductance. [L2] [10M]

6. A 50Ω resistor is connected in series with a 25μF Capacitor across a 230V, 50HZ AC Supply. Find (a) Capacitive reactance (b) Impedance (c) Current (d) Phase angle (e) Voltage drop across resistance (f) Voltage drop across Capacitance (g) Power Factor. [L2] [10M]

7. A resistance of 50Ω, inductance of 29.8mH, Capacitance of 3.4μF Capacitor are connected in series across a 200V, 250HZ AC Supply. Find (a) Impedance of circuit (b) Current (c) Power consumed in the circuit (d) Power factor (e) Voltage drop across resistance (f) Voltage drop across Inductance (g) Voltage drop across Capacitance. Also draw the phasor diagram for the circuit. [L2] [10M]

8. A Capacitor of 1μF is connected across an AC Voltage of V=170 sin (400t). Determine (a) Capacitive Reactance (b) Sinusoidal expression for current (c) Maximum current. [L1] [10M]

9. A Pure Inductive coil allows a current of 10A to flow from a 230V, 50HZ AC Supply. Find (a) Inductive Reactance (b) Inductance of the coil (c) Power Absorbed (d) Sinusoidal equations for Voltage and Current. [L1] [10M]

10. An AC Circuit consists of a pure resistance of 20Ω and it is connected across an AC supply of 230V, 50HZ. Find (a) Current (b) Power Consumed (c) Sinusoidal equations for Voltage and Current. [L1] [10M]

11. Find the form factor for the following waveform shown in fig(C): [L1] [10M]

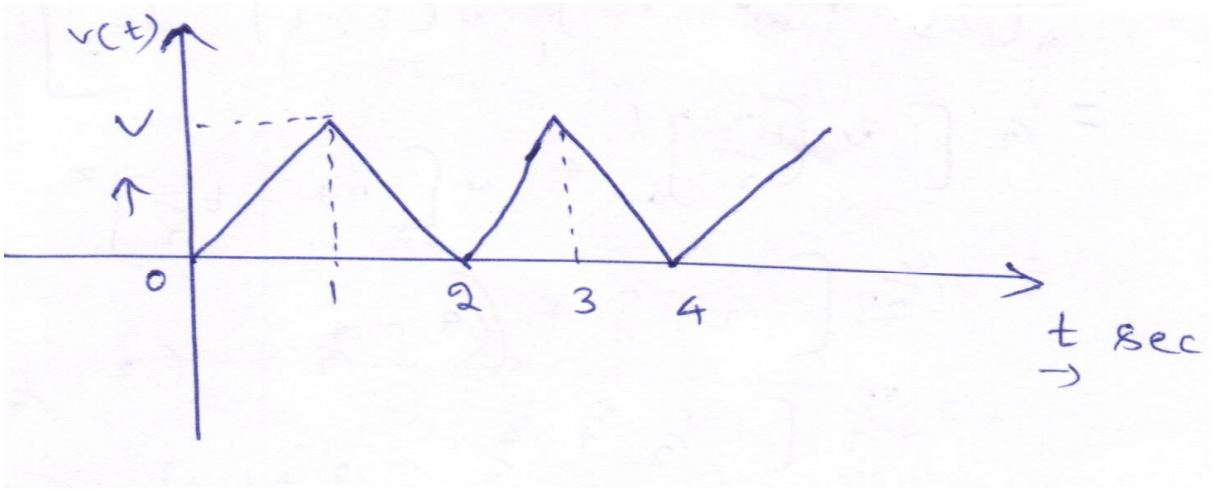

Fig. (C)

12. Find the form factor for the following waveform shown in fig(D): [L1] [10M]

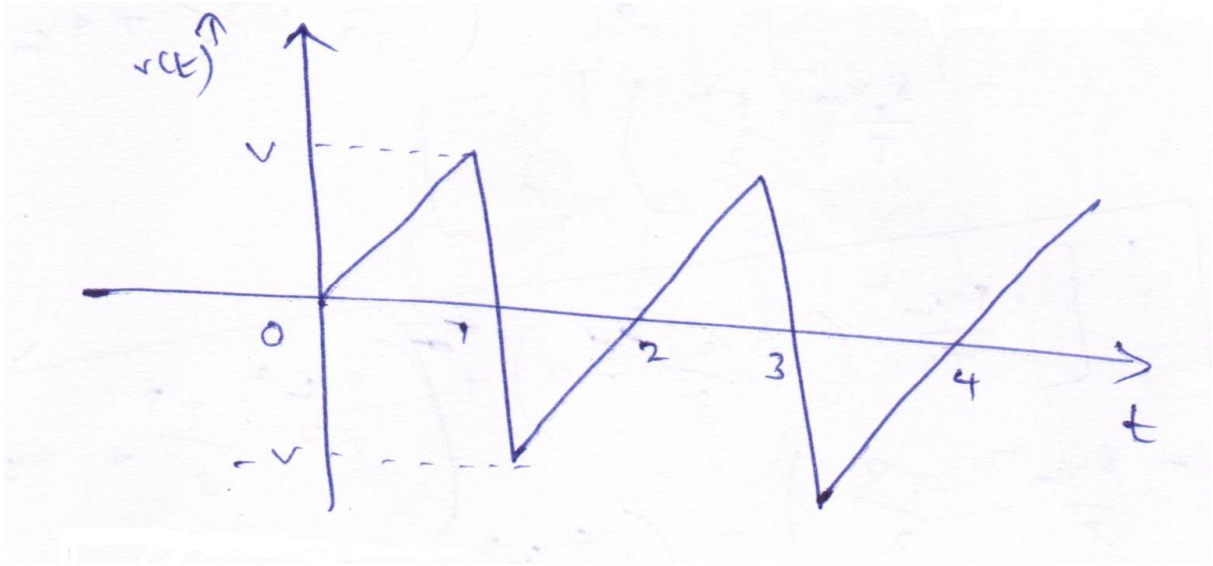

Fig. (D)

SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
(AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : Electrical Circuits(16EE201) **Course & Branch**: B.Tech - EEE

Year & Sem: I-B.Tech & II-Sem **Regulation:** R16

UNIT-III
LOCUS DIAGRAMS & RESONANCE

1. A series RLC circuit has R=10Ω, L=0.5H and C=40μF. The applied voltage is 100V. Find (a) Resonant frequency & Quality factor of a coil (b) Bandwidth (c) Upper and lower Half power frequencies (d) Current at resonance & current at half power points (e) Voltage across inductance & voltage across capacitance at resonance. [L3] [10M]

2. (a) In a parallel resonance circuit (Tank circuit) R=2Ω, L=1mH and C=10μF, Find the Resonant frequency, Dynamic impedance and Bandwidth. [L3] [5M]
   (b) Obtain the expression for resonant frequency for parallel RL-RC circuit. [L3] [5M]

3. Obtain the expression for resonant frequency, bandwidth and Q-factor for parallel R-L-C circuit. [L3] [10M]

4. Obtain the expression for resonant frequency, bandwidth and Q-factor for Series R-L-C circuit. [L3] [10M]

5. Two coils one of R_1=0.51Ω, L_1=32mH and other coil of R_2=1.3Ω, L_2=15mH are in series and are connected in series with a capacitor of C_1=25μF, C_2=62μF and a resistor of R_3=0.24Ω. Determine (a) Resonant frequency (b) Quality factor of the circuit (c) Bandwidth (d) Power dissipated in the circuit at resonance frequency if the supply is 230V AC Supply. [L3] [10M]

6. Write the comparison between series resonance and parallel resonance? [L2] [10M]

7. Draw the Locus diagram of a Series RL Circuit? [L3] [10M]

8. Draw the Locus diagram of a Series RC Circuit? [L3] [10M]

9. Derive the expression for resonant frequency of a Tank Circuit? [L1] [10M]

10. In a parallel Resonant circuit shown in figure. (1), find the Resonant frequency, Dynamic Impedance, Bandwidth, Q-factor and Current at resonance? [L3] [10M]

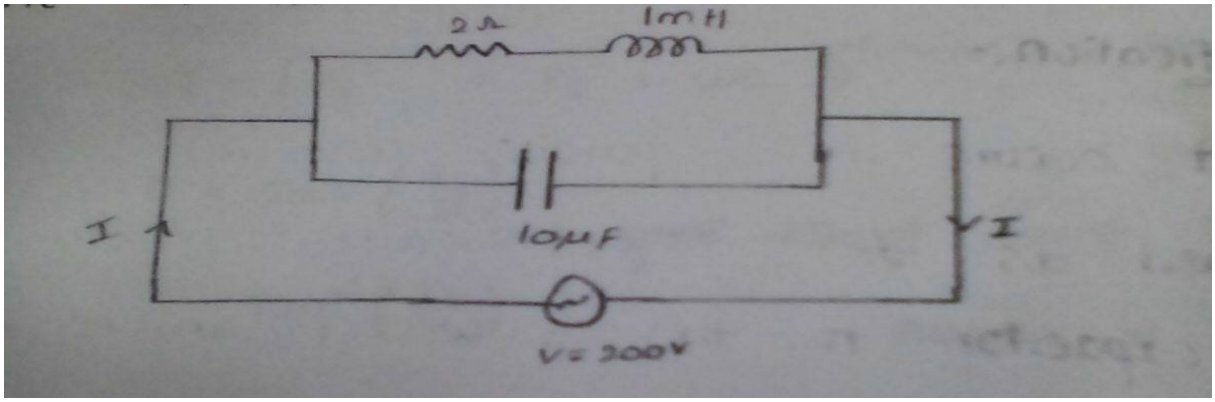

Fig.(1)

SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
(AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : Electrical Circuits(16EE201) **Course & Branch**: B.Tech - EEE

Year & Sem: I-B.Tech & II-Sem **Regulation:** R16

UNIT-IV
MAGNETIC CIRCUITS

1. Two coupled coils with L_1=0.02H, L_2=0.01H and K=0.5 are connected in four different ways Series aiding, series opposing, parallel aiding and parallel opposing. Determine the equivalent Inductances in all the four cases? [L3] [10M]

2. State and explain Faraday's Laws of Electro Magnetic Induction? [L1] [10M]

3. A coil of 100 turns is wound uniformly over a insulator ring with a mean circumference of 2m and a uniform sectional area of 0.025cm^2. If the coil is carrying a current of 2A. Calculate (a) the mmf of the circuit (b) magnetic field intensity (c) flux density (d) total flux. [L3] [10M]

4. Derive the expression for equivalent inductance when the coupled inductors are connected in Series aiding and series opposition? [L3] [10M]

5. Derive the expression for MMF for a composite series magnetic circuit? [L3] [10M]

6. Derive the expression for MMF for a parallel magnetic circuit? [L3] [10M]

7. Explain Self Inductance, Mutual Inductance and Co-efficient of coupling in detail? Give the relation between L1, L2, K & M? [L1] [10M]

8. Explain in detail about Statically Induced emf and Dynamically Induced emf? [L1] [10M]

9. Write the Comparison of Electric and Magnetic circuits? Also explain the analogy between the Electric and Magnetic circuits? [L1] [10M]

10. Derive the expression for equivalent inductance when the coupled inductors are connected in Parallel aiding and parallel opposition? [L3] [10M]

SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
(AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : Electrical Circuits(16EE201) **Course & Branch**: B.Tech - EEE

Year & Sem: I-B.Tech & II-Sem **Regulation:** R16

UNIT-V
NETWORK THEOREMS

1. Find the current passing through 3Ω Resistor for the circuit shown below in Fig(a) by using Superposition Theorem? [L3] [10M]

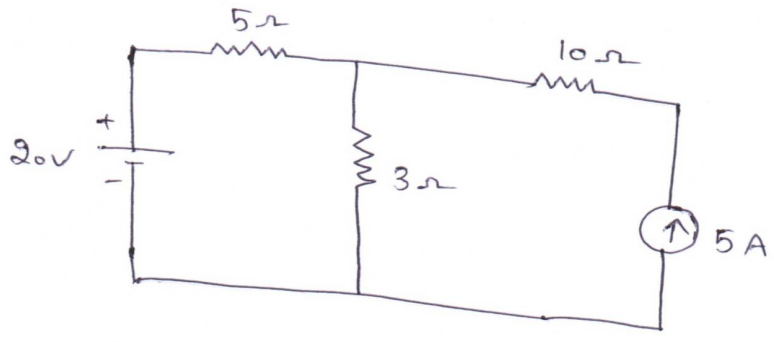

Fig. (a)

2. Determine the Norton's equivalent circuit for the circuit shown in Fig.(b) [L2] [10M]

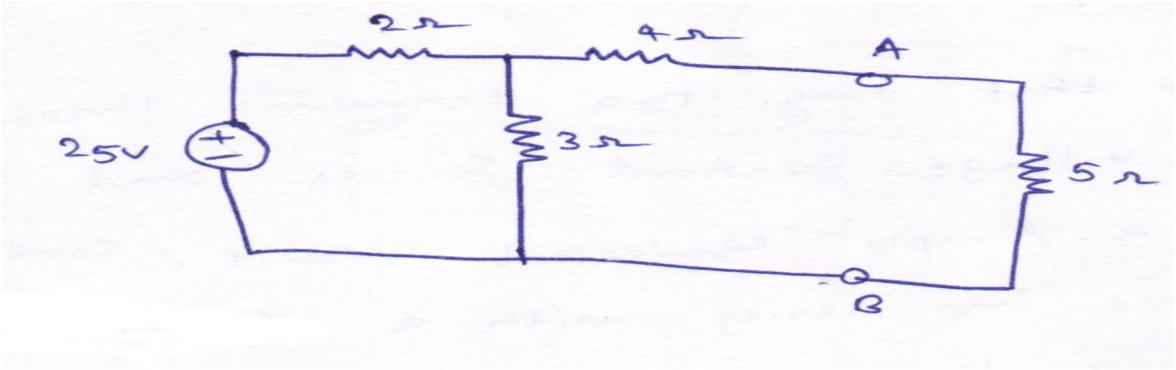

Fig.(b)

3. Using Millmann's Theorem, find the current in the 10Ω Resistor for the circuit shown in figure(c). [L2] [10M]

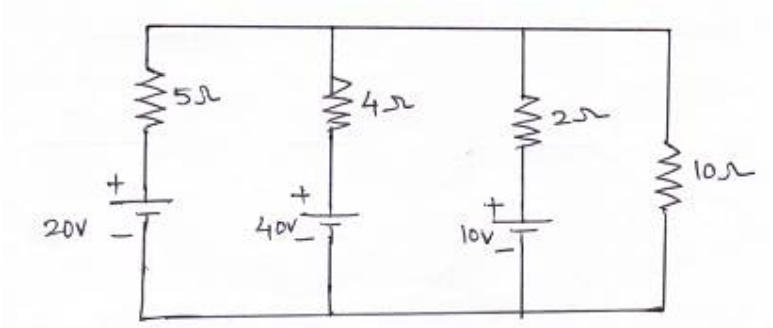

Fig. (c)

4. Verify Reciprocity Theorem for the network shown in figure (d) [L3] [10M]

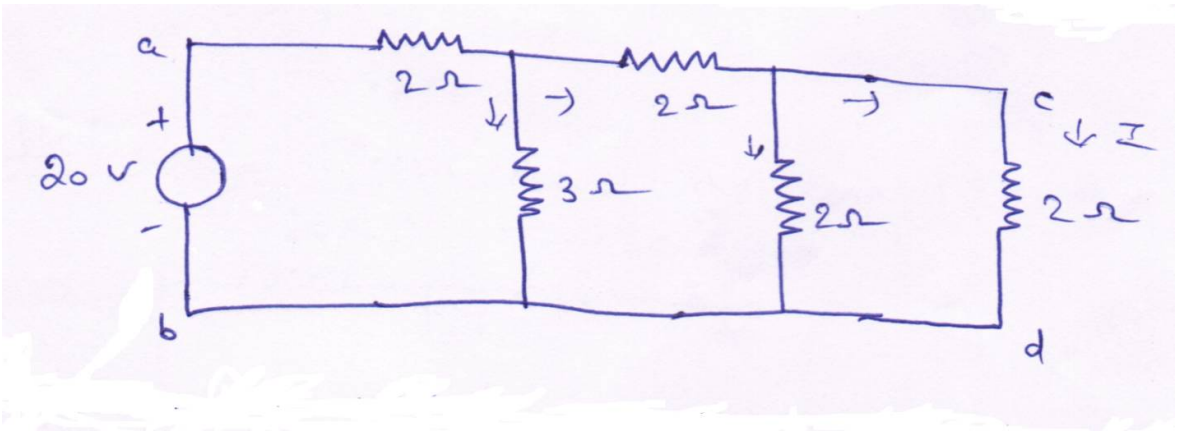

Fig. (d)

5. Determine the Norton's equivalent circuit for the circuit shown in Fig.(e) [L2] [10M]

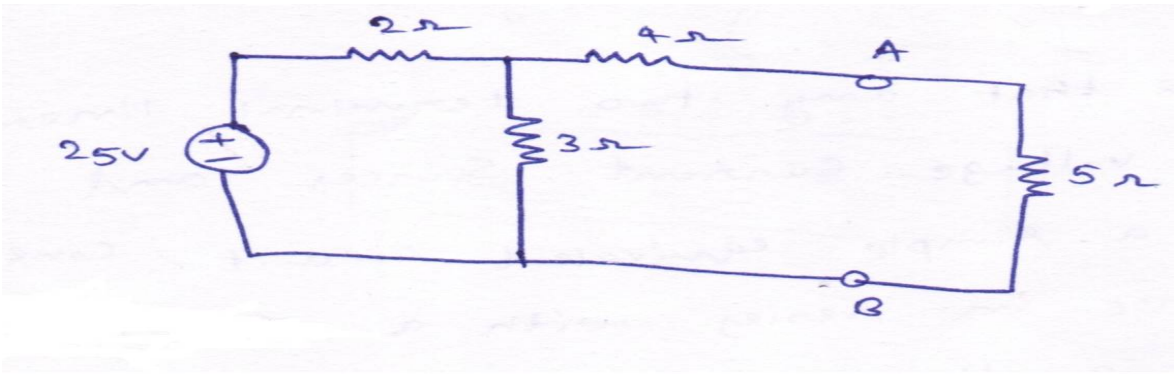

Fig. (e)

6. Determine the voltage across (2+j5) Ω impedance as shown in figure. (f) by using Super position Theorem? [L2] [10M]

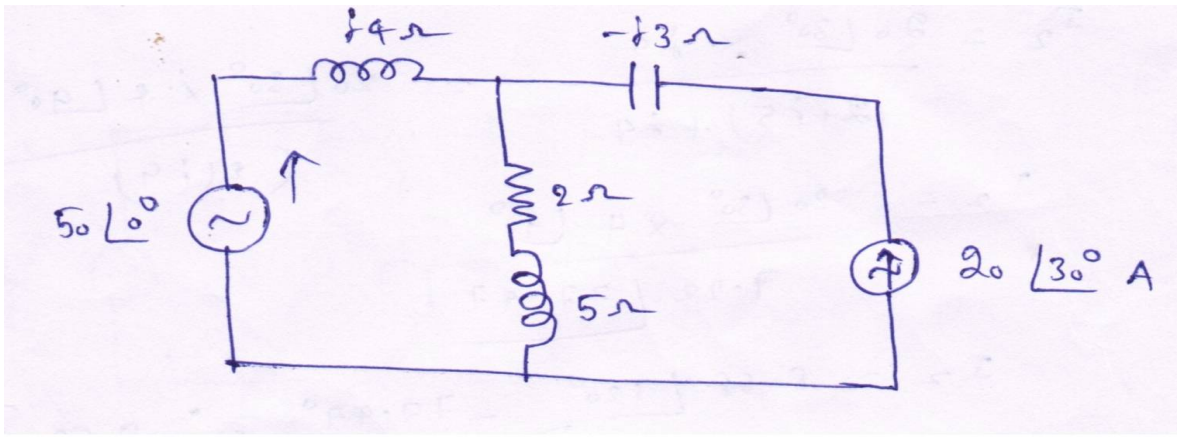

Fig. (f)

7. Determine the Thevenin's equivalent circuit for the circuit shown in figure. (g). [L2] [10M]

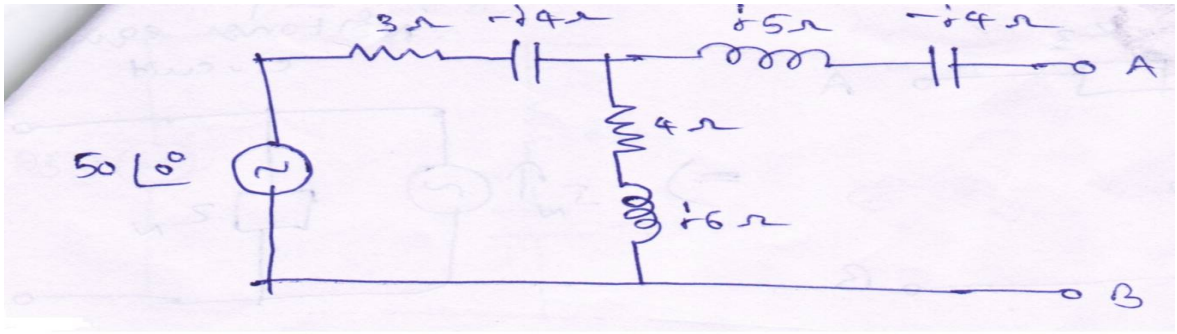

Fig. (g)

8. Determine the Norton's equivalent circuit for the circuit shown in figure. (h). [L2] [10M]

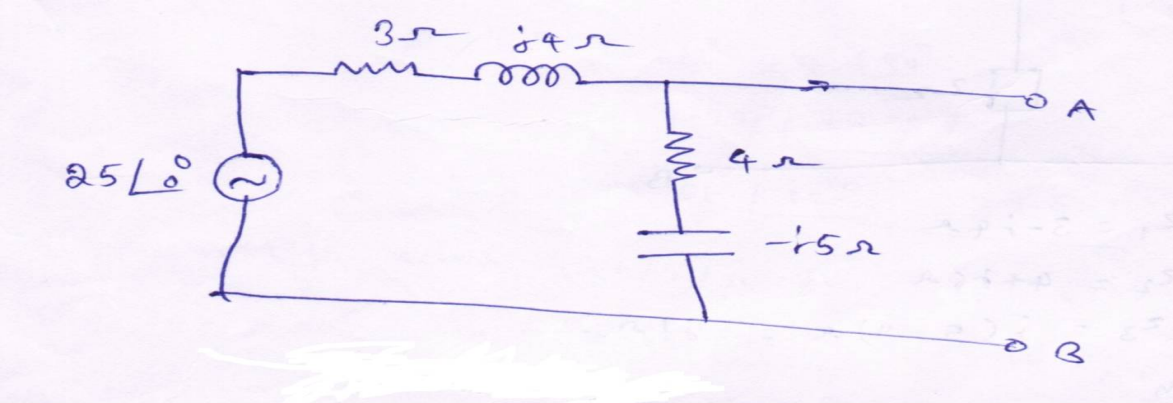

Fig. (h)

9. For the circuit shown in figure. (i), find the value of load impedance for which the source delivers maximum power. Also calculate the value of maximum power. [L3] [10M]

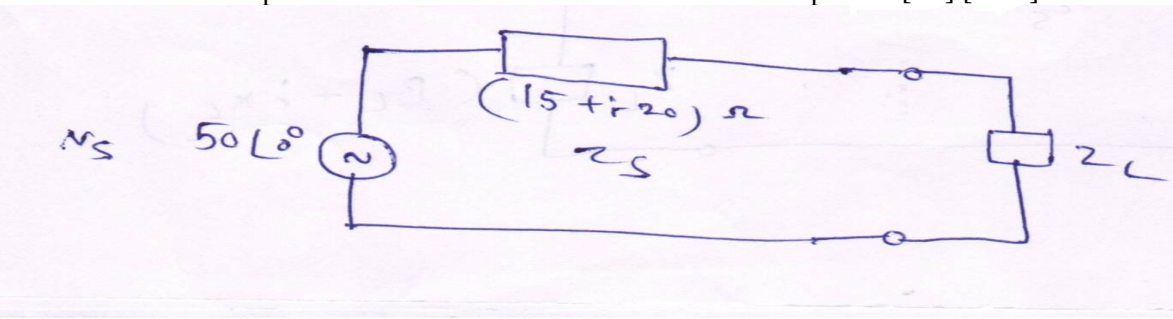

Fig. (i)

10. Derive the condition for the maximum power to be transferred from the source to the load. [L3] [10M]

Prepared by:

M SUBRAMANYAM
ASSISTANT PROFESSOR
DEPT. OF EEE
SIETK