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

QUESTION BANK (DESCRIPTIVE)

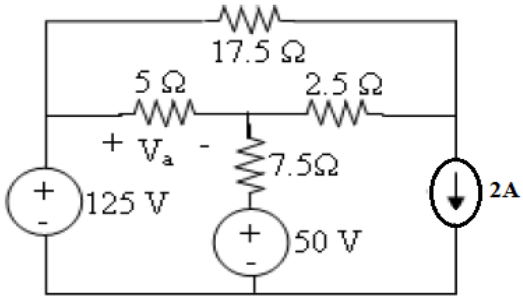
Subject with Code : Network Analysis(16EE205) **Course & Branch**: B.Tech - ECE

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

UNIT –I

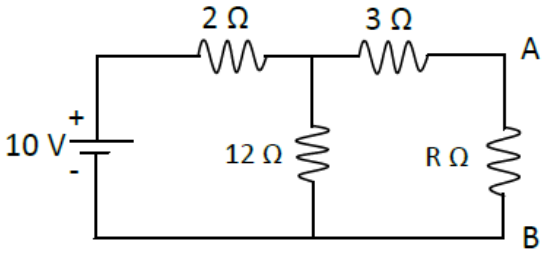
INTRODUCTION

1. a) What do you mean by an electric network and an electric circuit? [L1] [4M]
   b) Find the value of V_a for the following circuit using KVL. [L3] [6M]

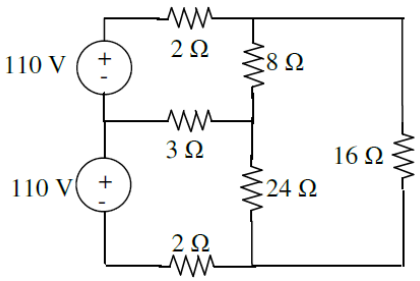


2. a) Explain the concept of source transformation? [L3] [4M]

   b) Find the maximum power delivered to the load by using maximum power transfer theorem for the following circuit. [L3] [6M]

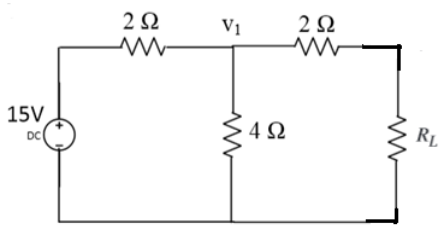


3. (a) State and explain Kirchhoff's laws? [L3] [4M]
   (b) Using nodal analysis find all branch currents for the following circuit [L3] [6M]



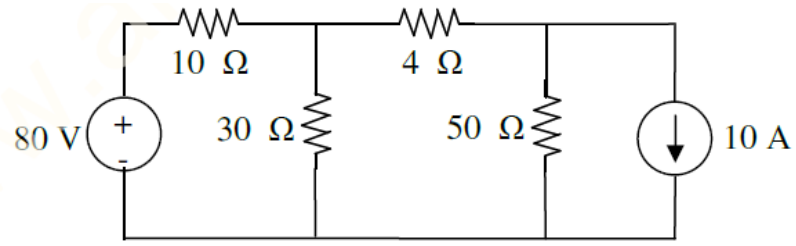
4. a) What is the condition for maximum power transfer to the load? [L3] [4M]

b) Find Thevenin's equivalent for the following circuit. [L3] [6M]



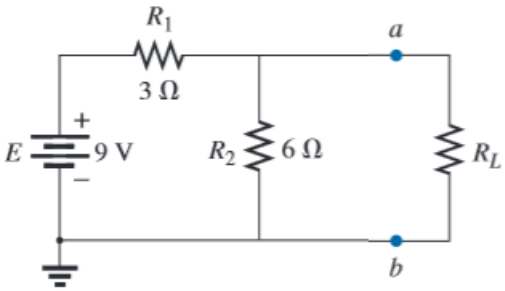
5. a) State and explain Superposition theorem? [L3] [4M]

b) Verify Superposition theorem for 4Ω resistor for the following circuit. [L3] [6M]



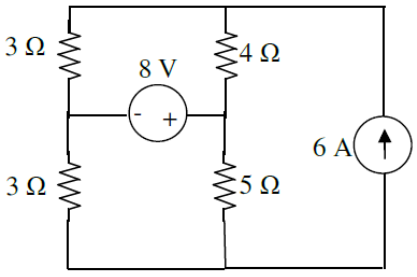
6. a) State and explain milliman's theorem. [L3] [4M]

b) Find Norton's equivalent for the following circuit. [L3] [6M]



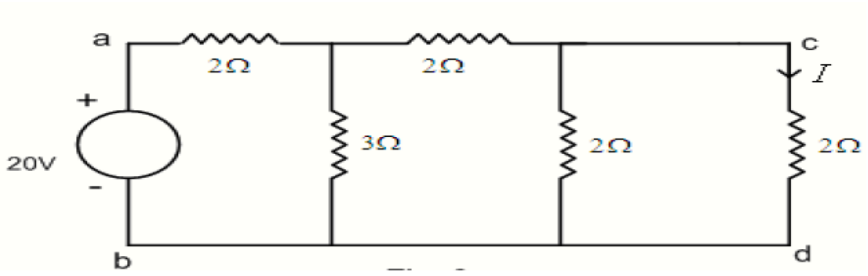
7. (a) State Kirchhoff's voltage law? [L3] [4M]

(b) Find branch currents for the following circuit. [L3] [6M]



8. a)State and explain Norton's theorem? [L3] [4M]

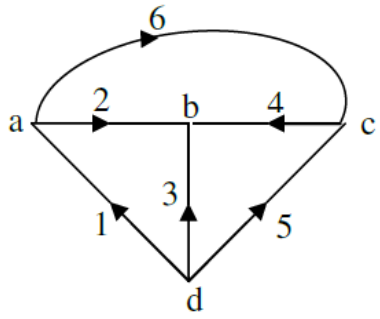
b) Verify the reciprocity theorem for the network shown in fig . [L3] [6M]



9. (a) Define the following terms

(i) Branch (ii) Sub graph (iii) Node (iii) Tree [L3] [4M]

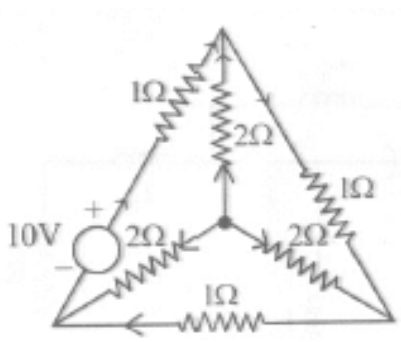
(b) For the graph shown below find incidence and cut set matrices. [L3] [6M]



10. (a) Define and state the properties of incidence matrix. [L2] [4M]

(b) For the network shown below draw the graph and find incidence and tie – set matrices.

[L3] [6M]



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. a) What is time constant? What are the time constants of series RL and RC circuits? [L3] [4M]
   b) Deduce the transient response source free series RC circuit. [L3] [6M]
2. (a) Explain about properties of Exponential Response of RLC circuits. [L3] [4M]
   (b) Deduce the transient response source free series RL circuit [L3] [6M]
3. (a) Explain about Source free RL and RC Circuits. [L3] [4M]
   (b) Explain the complete response of source free series RLC Circuits. [L3] [6M]
4. (a) Explain about Natural & Forced Response of RLC Circuits. [L3] [4M]
   (b) Explain the complete response of source free parallel RLC Circuits. [L3] [6M]

4.a) Define Admittance [L3] [2M]

b) The impedances of parallel circuit are Z1= (6+j8) ohms and Z2 = (8-j6) ohms. If the applied voltage is 120V, find (i) current and power factor of each branch (ii) overall current (iii) power consumed by each impedance. Draw the phasor diagram. [L3] [8M]

5. (a) Explain the phasor relation for R,L,C elements. [L3] [4M]
   (b) A resistor of 50Ω, inductance of 100mH and a capacitance of 100μF are connected in series across 200V, 50Hz supply. Determine the following [L3] [6M]
   (i) Impedance (ii) current flowing through the circuit (iii) power factor
   (iv) voltage across R,L &C (v) power in watts
6. (a) Explain the phasor relation for series RL and RC circuit. [L3] [4M]
   (b) A 120V AC circuit contain 10 Ω resistance and 30 Ω inductive reactance in series. What is average power of this circuit. [L3] [6M]
7. (a) Explain the phasor relation for parallel RLC circuit. [L2] [4M]
   (b) A parallel RLC circuit is supplied with a voltage source of 230 V, 50Hz. Determine circuit current and power factor if R=40Ω, L=0.2H and C=50μF. [L3] [6M]
8. (a) Define power factor, apparent power, active power and reactive power. [L3] [4M]

   (b) The impedances of parallel circuit are Z1= (4+j6) ohms and Z2 = (12-j8) ohms. If the applied voltage is 220V, find (i) current and power factor of each branch (ii) overall current (iii) power consumed by each impedance. Draw the phasor diagram. [L3] [6M]
9. (a) Explain the phasor relation for parallel RL and RC elements. [L3] [4M]

(b) A 120V AC circuit contain 10 Ω resistance and 30 Ω inductive reactance in series. What is average power of this circuit. [L3] [6M]

10. (a) Explain the characteristics of sinusoids. [L3] [4M]
(b) A resistor of 150Ω, inductance of 200mH and a capacitance of 10μF are connected in series across 500V, 150Hz supply. Determine the following [L3] [6M]
(i) Impedance (ii) current flowing through the circuit (iii) power factor
(iv) voltage across R,L &C (v) power in watts

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
RESONANCE & MAGNETICALLY COUPLED CIRCUITS

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] [6M]
(b) Obtain the expression for resonant frequency for parallel RL-RC circuit. [L3] [4M]
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. Show that the resonant frequency circuit $f_r^2 = f_1 f_2$ where f_1 and f_2 are the half power frequencies and f_r is the resonant frequency. [L3] [10M]
6. Write the comparison between series resonance and parallel resonance? [L2] [10M]
7. Define and explain self and mutual inductance. [L3] [10M]
8. a) Explain about dot convention in mutually coupled circuits. [L1] [4M]
b) Discuss briefly about energy considerations in mutually coupled circuits. [L3] [6M]
9. Explain about linear transformer and ideal transformer. [L2] [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]

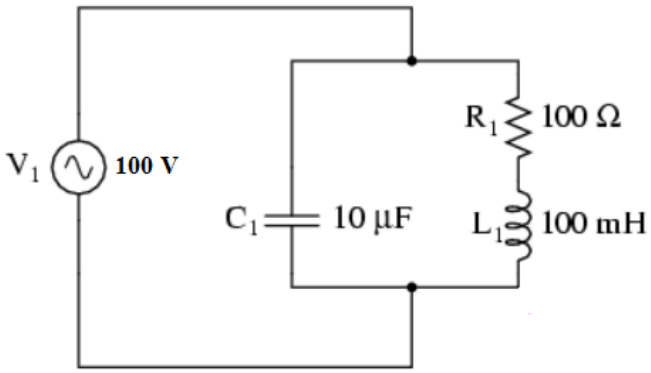


Fig.(1)

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

QUESTION BANK (DESCRIPTIVE)

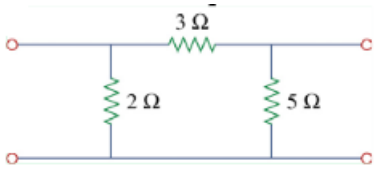
Subject with Code : Electrical Circuits(16EE201) **Course & Branch**: B.Tech - EEE

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

UNIT-IV

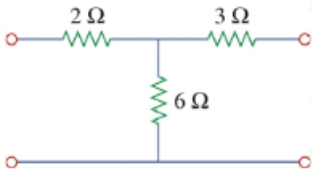
TWO PORT NETWORKS & STATE VARIABLE ANALYSIS

1. a) Find the Z- parameters for the following circuit. [L3] [6M]



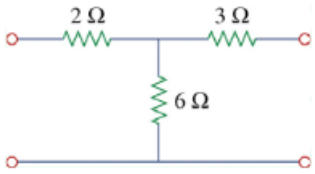
b) Express ABCD parameters in terms of h parameters. [L3] [4M]

2. a) Find the Y- parameters for the following circuit. [L3] [6M]



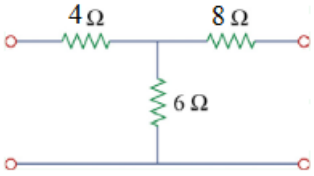
b) Express h parameters in terms of ABCD parameters. [L3] [4M]

3. a) Find the ABCD parameters for the following circuit. [L3] [6M]



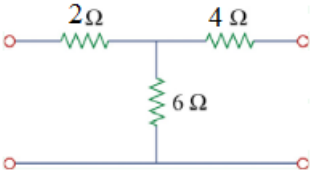
b) Express Y parameters in terms of h parameters. [L3] [4M]

4. a) Find the h- parameters for the following circuit. [L3] [6M]

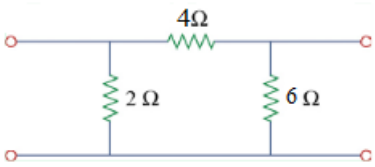


b) Find the relationship between Z and h parameters. [L3] [4M]

5. Find the Z and Y parameters for the following circuit. [L3] [10M]

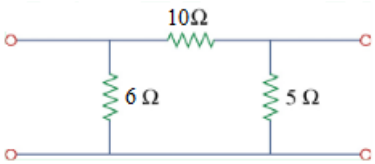


6. a)Find the Y- parameters for the following circuit. [L3] [6M]



b) Express Z parameters in terms of ABCD parameters. [L3] [4M]

7. Find the ABCD and h - parameters for the following circuit. [L3] [10M]



8. Explain about the state variables and state variables of circuits. [L3] [10M]

9. a) What are the advantages of state variable analysis. [L3] [4M]

b) The transfer function of a system is G(s)=2/(s+1)(s+2). Obtain a state variable representation for the system. [L3] [6M]

10. Explain about proper and improper behavior of the circuits. [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
FILTERS

1. a) Explain Neper and Decibel. [L2] [4M]
   b) What is a constant K low pass filter, derive its characteristics impedance. [L2] [6M]
2. a) What is a filter? Explain about various types of filters. [L2] [4M]
   b) Explain the classification of pass band and stop band in detail. [L2] [6M]
3. Derive the expression for characteristic impedance in a pass band filter. [L2] [10M]
4. Explain the design procedure for a constant K low pass filter and its characteristics. [L2] [10M]
5. Design a constant K high pass filter and explain its design procedure in detail. [L2] [10M]
6. What is high pass filter. Explain the general configuration and parameters of a contant-K high pass filter. [L2] [10M]
7. What is an m-derived filter? Explain the general configuration and parameters of m-derived low pass filter. [L2] [10M]
8. Derive necessary expressions for m-derived high pass filter. [L2] [10M]
9. Give the analysis for the design of constant-K band pass filter. [L2] [10M]
10. Design a band elimination filter and explain its design procedure in detail. [L2] [10M]

Prepared by:

C.R.HEMAVATHI
ASSISTANT PROFESSOR
DEPT. OF EEE
SIETK