Total No. of Questions :09]   [Total No. of Pages : 02

II/IV B.Tech. DEGREE EXAMINATIONS, NOV/DEC-2018
First Semester
EC/EE
NETWORK THEORY

Time: Three Hours   **Maximum marks:60**

Answer Question No.1 Compulsory   **12X1=12 M**
Answer ONE Question from each Unit   **4X12=48 M**

1. a) State kirchoff's current law?

    b) Define an ideal current source?

    c) Define the term 'tree'?

    d) Define the term Link?

    e) Define Phase?

    f) Define power factor?

    g) What are the initial conditions in RLC elements

    h) Explain the term time constant.

    i) State Norton's theorem.

    j) Write an expression for the band width of a series resonant circuit in terms of ϕ factor and resonant frequency?

    k) Define self inductance.

    l) State Tellegan's theorem.

UNIT-I

2. a) Reduce the network of fig into a single Resistance between A and B
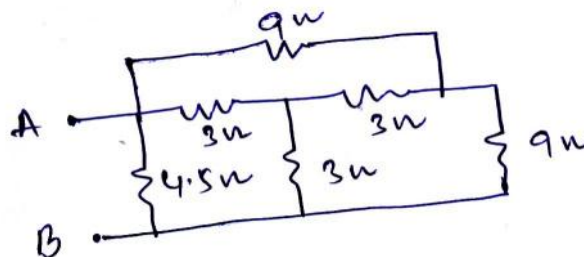
b)   Explain the following (i) Cutset matrices   (ii) loop matrices.

(OR)

3.   Explain the following

a)   Source transformation

b)   Star Delta transformation

c)   VI characteristics of passive elements

UNIT-II

4.   An RLC series circuit has R=10   , L=0.5 H and C=10 μ F connected across a 200V, 50 Hz supply. Find (i) Reactance (ii) Impedance (iii) Current (iv) Phase angle (v) Power factor (vi) Voltage across R,L and C.

(OR)

5.   Find the RMS value, average value, form factor and crest factor of a half rectified sinu soidal waveforms.

UNIT-III

6.   a)   Explain initial and final value theorems of Laplace transforms.

b)   Explain the pulse response of parallel RL circuit.

(OR)

7.   For a RC series circuit, a sinusoidal voltage V$_m$ sinwt=v(t) is applied at t=0. Find the expression for transient current using both differential equation approach and Laplace transform approach.

UNIT-IV

8.   State and explain the super position theorem.

Find the current through 3.75   resistor in the circuit shown in fig by superposition theorem.
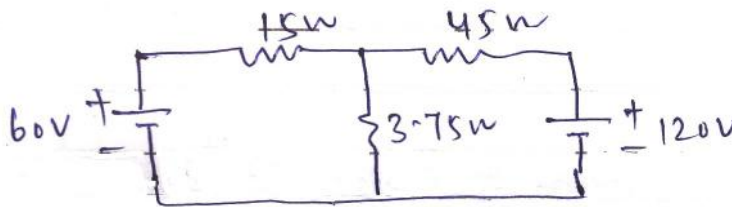
(OR)

9.   A series RLC circuit with R=100   , L=10mH and C=1μ F is connected to a 20 V ac supply. Find the resonant frequency, quality factor, half power frequencies, Band width and current at resonance.

Total No. of Questions :09]   [Total No. of Pages : 03

II/IV B.Tech. DEGREE (Supple) EXAMINATIONS, JUNE/JULY-2018
First Semester
EC/EE
NETWORK THEORY

Time: Three Hours   **Maximum marks:60**

Answer Question No.1 Compulsory   **12X1=12 M**

Answer ONE Question from each Unit   **4X12=48 M**

1. a)   State kirchhoffs laws.

    b)   What is the purpose of star-Delta transformation

    c)   Define the term 'Tree'.

    d)   Define the term network

    e)   State current division Rule.

    f)   What is a dual network

    g)   Define RMS value.

    h)   Mention the properties of a series RLC circuit.

    i)   State Reciprocity theorem.

    j)   State compensation theorem.

    k)   Define the term ϕ factor.

    l)   Define time constant of RL circuit

UNIT-I

2. a)   Find R_{eq} for the following circuit.

P.T.O
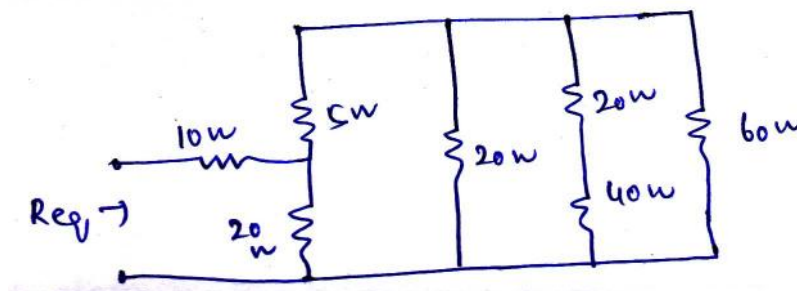
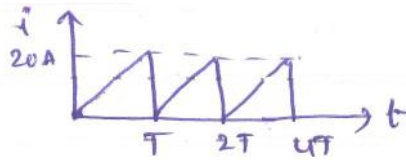b)   Find the power absorbed by the dependent current source.
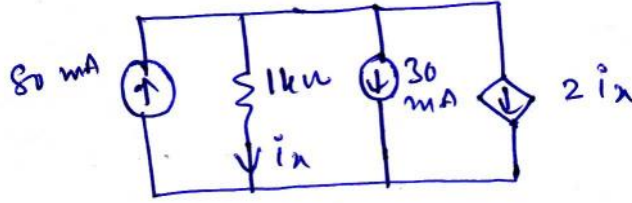
(OR)

3.   a)   Discuss in detail about the series and parallel connections of two coupled coils.

b)   Explain the procedure steps of Nodal analysis for DC circuits.

UNIT-II

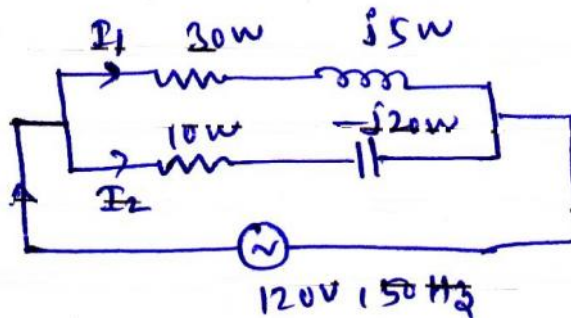4.   a)   Find the RMS and average value of the saw tooth waveform shown in fig.

b)   Find the effective (a) RMS value of the given voltage waveform

$$\vartheta = 15 + 10\sin\left(314t + \frac{\pi}{3}\right)$$

(OR)

5.   An ac circuit consists of parallel branches as shown in fig. Calculate (i) equivalent imped-
ance of the circuit (ii) equivalent admittance (iii) total current (iv) power factor (v) total
power (vi) power taken by each branch.

UNIT-III

6. Find f(t) if f(s) equals to
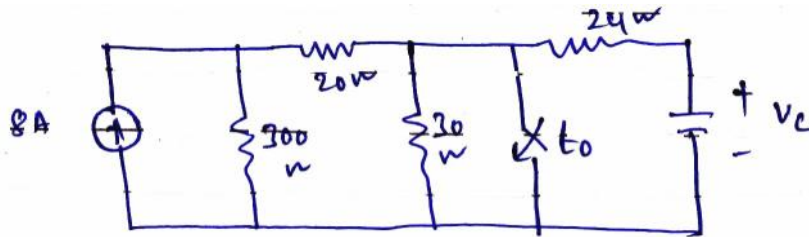
(i) $\dfrac{1}{(s+1)(s+2)}$

(ii) $\dfrac{s}{(s+1)(s+2)}$

(iii) $\dfrac{s+1}{s+2}$

(OR)

7. a) State and explain the initial and final value theorems.

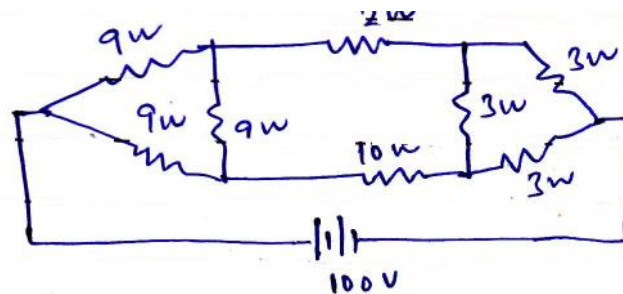   b) Find $V_c(t)$ for all time in the circuit.

UNIT-IV

8. a) State and explain superposition theorem.

   b) Find the current through 10 n Resistor in the circuit shown in fig using Thevenin's theorem.

(OR)

9. a) Draw the impedance curve and current curve for a series RLC circuit and explain its equation.

   b) A series resonant circuit has a bandwidth of 100Hz and contains a 200 mH inductance and a 2 μ F capacitance. Determine (i) to (ii) ϕ_0 (iii) Z_{in} at Resonance. Where to $\rightarrow$ is the resonant frequency.

II/IV B. Tech. (Supple) DEGREE EXAMINATIONS, NOV/DEC - 2018

First Semester

EC / EE

CIRCUIT THEORY

Time : **Three Hours**   Maximum : **70** Marks

Answer Question No. 1 Compulsory.   14x1=14 M

Answer ONE question from each Unit.   4x14=56 M

1. a)   Define an ideal current source.

    b)   State kirchoff's current law.

    c)   Define the term co-tree.

    d)   Define active elements.

    e)   Define crest factor.

    f)   Define form factor.

    g)   What is the power factor of a purely inductive load ?

    h)   Write an expression for energy stored in capacitor.

    i)   State Tellegan's theorem.

    j)   State Millman's theorem.

    k)   What is a super node ?

    l)   Write the equation for time constant of an R-L circuit.

    m)   What is the laplace transform of an impulse signal delayed by 2 seconds.

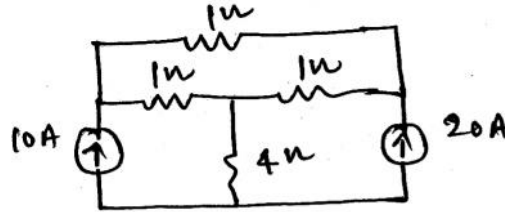   n)   What is source transformation ?

UNIT - I

2. a)   Using source transformation find I_L of the circuit shown in fig.
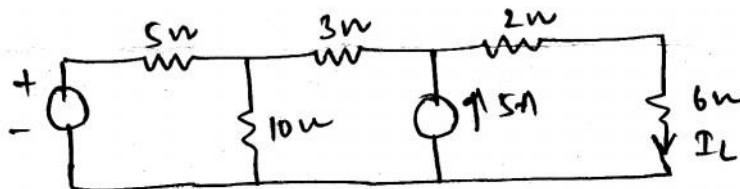
P.T.O.

b)   Explain the following :

(i) Active and passive elements.

(ii) Star-Delta transformation.

(OR)

3. Find the current through 4Ω Resistor in the circuit of fig by nodal method.

UNIT - II

4. A resistance of 10Ω and a capacitance of 100 µF are connected in series across 150V, 50 Hz supply. Find (i) Capacitive Reactance (ii) Impedance (iii) Current (iv) Phase angle (v) Power factor (vi) Active power (vii) Reactive power.

(OR)

5. a)   Define the terms (i) Amplitude (ii) Phase.

b)   Find the RMS and average value of a full Rectified Sinusoidal current waveform. Hence find form factor and amplitude factor.
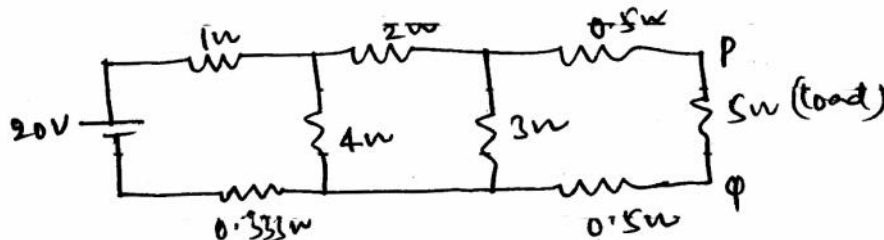
UNIT - III

6. a)   State and explain the superposition theorem.

b)   Find the current in 75Ω Resistor in the circuit shown in fig. using superposition theorem.
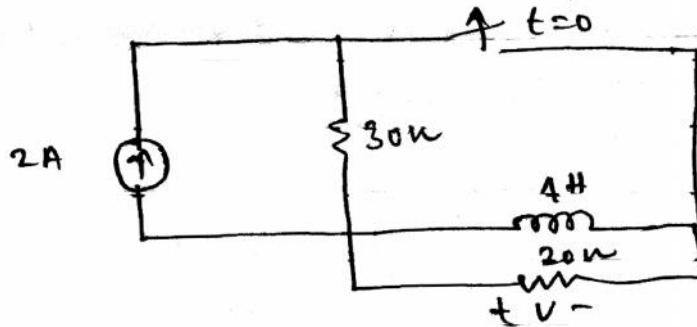

(OR)
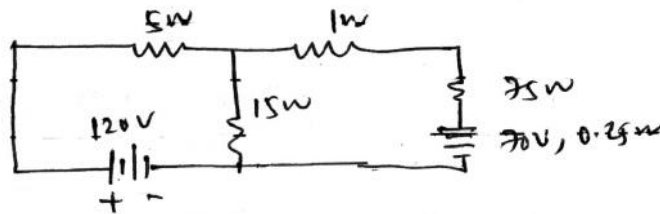
7. a)   State and explain Thevenin's theorem.

b)   Find the current and power through the load in the circuit shown in fig by Thevenin's theorem.

UNIT - IV

8. a) Explain the initial and final value theorems of Laplace transforms.

   b) Determine the value of i_L at the instant just after switch charges.

(OR)

9. Write short notes on

   a) DC analysis and control statements.

   b) AC analysis and control statements.