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

## II/IV B.Tech. DEGREE EXAMINATIONS, NOVEMBER- 2019
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)   What are the passive elements

    b)   State kirchoff's current law

    c)   Define the term 'oriented graph'.

    d)   Define 'Tree' of a graph

    e)   Give the expression for the number of independent loop equations in terms of circuit elements and nodes.

    f)   Define phase

    g)   Define form factor

    h)   State initial value theorem

    i)   State Thevenin's theorem

    j)   State Millman's theorem

    k)   Define the Q factor of a circuit

    l)   Define bandwidth?

UNIT-I

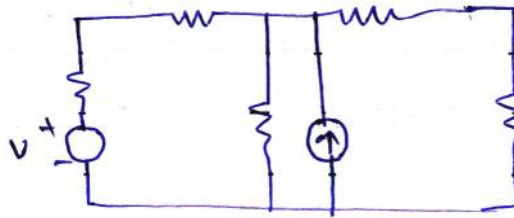2. a)   Find the value of R in the circuit of fig.
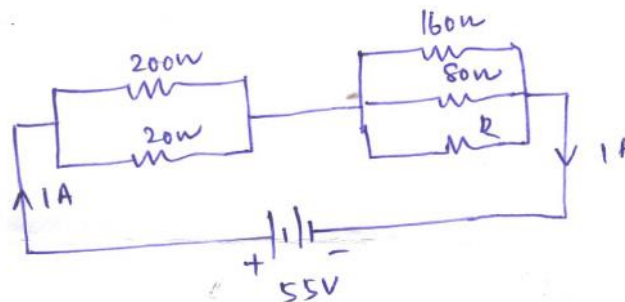
b)   Find the single equivalent resistance between A and B in the circuit of fig by network reduction.
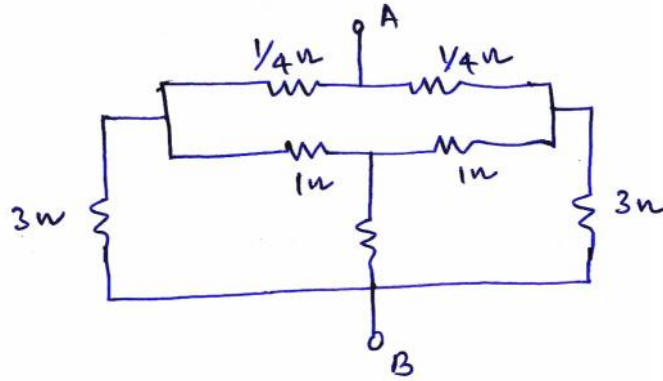
(OR)

3.   For the network shown in fig. develop the fundamental cut set matrix and write K_{CL} equations.

UNIT-II

4.   Explain the following   (a) Sinusoidal waveform   (b) power factor   (c) Complex power

(OR)

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

UNIT-III

6.   Find the inverse Laplace transform of given F(s)

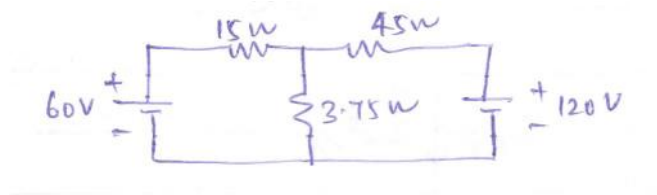a) $\dfrac{s+2}{s(s+3)(s+4)}$ b) $\dfrac{s-2}{s(s+1)^3}$

P.T.O

(OR)

7. For series RLC circuit, the capacitor is initially charged to IV, find the current i(t) when the switch k is closed at t=0, use laplace transform.

UNIT-IV

8. a) State and explain superposition theorem.

    b) Find the current $3.75\,\Omega$ resistor in the circuit shown in fig by superposition theorem.


(OR)

9. A RLC series circuit has a resistance of $100\,\Omega$, Inductance 0.5H and the maximum current flows through it at a frequency of 40Hz. If the supply is 100V at 50 cps, find the current, powerfactor and voltage across each element.

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II/IV B.Tech. (Supple) DEGREE EXAMINATIONS, JUNE 2019
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 voltage law

    b) Define an ideal, current sources?

    c) Define the term cotree?

    d) Define planar graphs?

    e) Define complex power?

    f) Define the term Inductor

    g) What is meant by bi-lateral elements.

    h) Define the term power factor

    i) State Thevenins theorem

    j) Define the ϕ factor of a circuit

    k) Write the expression for the resonant frequency of RLC series circuit.

    l) What is the dynamic resistance of the parallel resonant circuit.

UNIT-I

2. a) Find the magnitude of currents in 10   resistor in the network of fig.
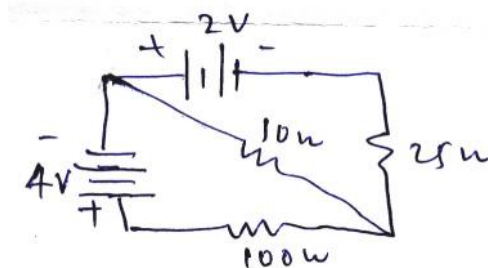
b)   Find the current through 4   resistor in the circuit of fig by nodal method
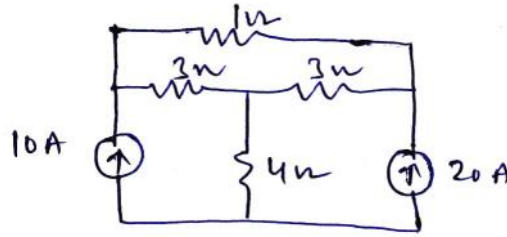
(OR)

3.   Define the following terms

a)   Graph   b)   Oriented graph   c)   Twig

d)   Link   e)   Path   f)   Non planar graph

UNIT-II

4.   Find the RMS and average value of a full rectified sinusoidal current waveform. Hence find form factor and amplitude factor.

(OR)

5.   A Resistor of 6   and an inductor of 25.5 mH are connected in series across a 220V, 50Hz supply. Find (i) The inductive reactance (ii) Impedance (iii) Current (iv) Phase angle (v) power factor (vi) Active power (vii) reactive power (viii) voltage across the resistor and (ix) voltage across the inductor.

UNIT-III

6.   a)   Explain in detail and derive the pulse response of series RC circuit.

b)   Explain initial and final value theorems of a laplace transforms.
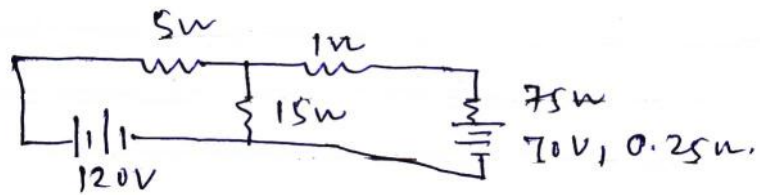
(OR)

7.   For a RL circuit, a sinusoidal voltage $V_m \sin \omega t = V(t)$ 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 superposition theorem. Find the current in 75   resistor in the circuit, shown in fig by using the above theorem.

P.T.O

(OR)

9.   A RLC series circuit has a resistance of 100 Ω, Inductance 0.5 H and the maximum current flows through it at a frequency of 40 Hz. If the supply is 100V at 50 cps, find the current, power factor and voltage across each element.