Question Paper Code: 53403

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Electronics and Communication Engineering

15UEC303 - CIRCUIT THEORY

(Regulation 2015)

Duration: One hour   Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. The complementary set of branches of the tree is called the _____ of the graph   CO1- R

    (a) Co-tree   (b) Twigs   (c) Links   (d) Chords

2. If R_1 and R_2 are connected in parallel then the current through R_1 is   CO1- R

    (a) $I_2*[R_2 / (R_1+R_2)$ (b) $I*[R_1 / (R_1+R_2)]$ (c) $I*[R_2 / (R_1+R_2)]$ (d) $I*[(R_1+R_2)/ R_2]$

3. Thevenin's equivalent circuit consists of _____ with impedance.   CO2- R

    (a) Voltage source in parallel   (b) Voltage source in series.

    (c) Current source in series   (d) Current source in parallel

4. The Thevenin's equivalent circuit contains   CO2- R

    (a) voltage source in series with resistance

    (b) voltage source in parallel with resistance

    (c) current source in series with resistance

    (d) current source in parallel with resistance

5. In a series RLC circuit , the current _____ the applied voltage when $X_L < X_C$ CO3- R

    (a) Lag behind   (b) Leads   (c) In phase with   (d) Not related to

6. If $X_L = 23 \ \Omega$ and the supply frequency is 50 Hz, then inductance L value is   CO3- R

    (a) 0.053 H   (b) 0.063 H   (c) 0.073 H   (d) 0.054 H

7. Transmission parameters are also called as_____   CO4- R

(a) ABCD parameter   (b) Y- parameters   (c) Z-parameters   (d) H-parameters

8. The damped frequency of oscillation β is given by   CO4- R

(a) $\omega_n * \sqrt{(1-\sigma^2)}$ (b) $\omega_n * (1-\sigma^2)$ (c) $\omega_n / (1-\sigma^2)$ (d) $\omega_n * \sigma^2$

9. A tuned amplifier uses _____ load   CO5- R

(a) Resistive   (b) Capacitive   (c) Inductive   (d)LC tank

10 In a star connected circuit the value of power is given by   CO5- R

(a) $\sqrt{3}\ V_{ph}*I_{ph}*\cos\phi$ (b) $\sqrt{3}\ V_L*I_L*\cos\phi$

(c) $3\ V_L*I_L*\cos\phi$ (d) $\sqrt{3}\ V_L*I_L*\sin\phi$

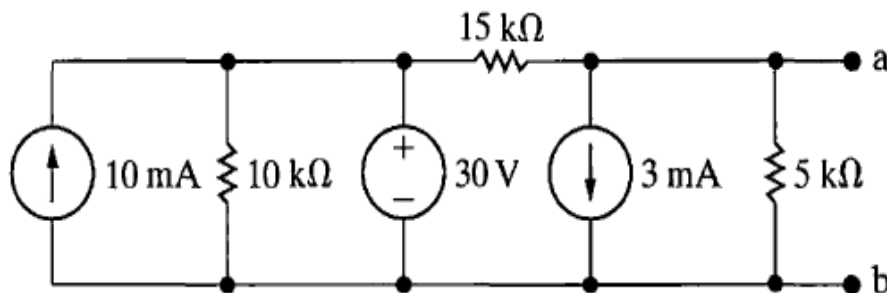PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11.   Calculate loop currents by mesh analysis   CO1- App   (8)
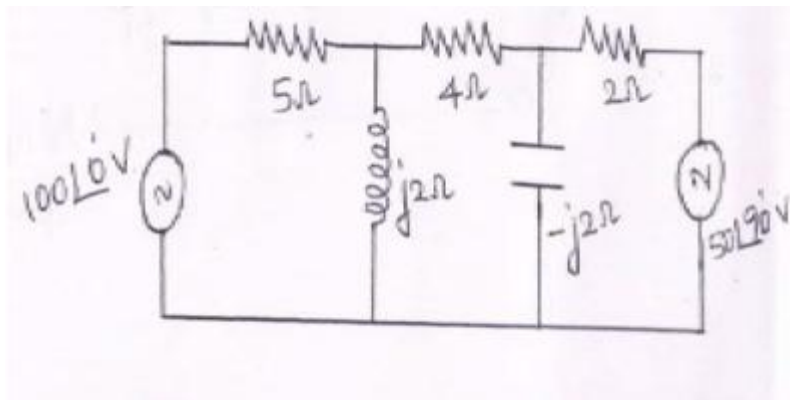
12.   Obtain the Norton's equivalent across the terminal ab.   CO2- App   (8)

13.   For the series resonant circuit with R=2 Ω, $X_L=X_C=10\Omega$ and   CO3- Ana   (8)
         E=10V. find I, V_R, V_L and V_C at resonance. Also, if resonant
         frequency is 5000Hz, determine bandwidth, Q factor, half power
         frequencies and power dissipated in the circuit at resonance and at
         the half power frequencies. Derive the expression for resonant

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frequency.

14.   Find Z parameters for the following network.   CO4- App   (8)
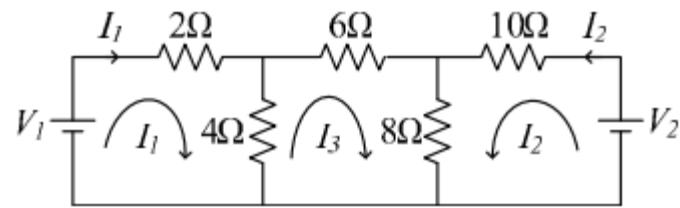
15.   Derive the mutual inductance and the coupling coefficient of the   CO5- U   (8)
transformer with necessary illustration

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