Reg. No. :

Question Paper Code: 33504

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

Third Semester

Electronics and Instrumentation Engineering

01UEI304 - ELECTRICAL CIRCUITS AND NETWORKS

(Common to Instrumentation and Control Engineering)

(Regulation 2013)

Duration: 1.15 hrs   Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. Ohm's law is not applicable to

    (a) DC circuits   (b) high currents

    (c) small resistors   (d) Semi-conductors

2. A circuit contains two un-equal resistances in parallel

    (a) current is same in both

    (b) large current flows in larger resistor

    (c) potential difference across each is same

    (d) smaller resistance has smaller conductance

3. Thevenin resistance R_{th} is found

    (a) By removing voltage source along with their internal resistance
    (b) By short-circuiting the given two terminals

    (c) Between any two open terminals

    (d) Between same open terminals

4. If the source impedance is purely resistive R_g and load impedance consists of variable R_L and fixed reactance X ,then ,for maximum transfer

    (a) $R_L = R_g$ (b) $R_L = R_g^2 + X^2$ (c) $R_L = X$ (d) $R_L = X^2$

5. For occurrence of resonance which of the following elements are required?

    (a) R   (b) L   (c) C   (d) both (ii) and (iii)

6. If the bandwidth of a filter increases

    (a) Q increases   (b) The roll-off rate increases

    (c) The half power frequency decreases   (d) The center frequency decreases

7. By which of the following elements transients will not occur

    (a) R   (b) L   (c) C   (d) all the above

8. With some initial change at $t = 0+$, a capacitor will act as

    (a) Short circuit   (b) Open circuit

    (c) A voltage source   (d) A current source

9. In a three-phase system, the volt ampere rating is given by

    (a) $3V_L I_L$ (b) $\sqrt{3}V_L I_L$ (c) $V_L I_L$ (d) $3\sqrt{3}V_L I_L$

10. Wattmeter deflection in ac circuit is proportional to

    (a) average power in the circuit   (b) maximum power in the circuit

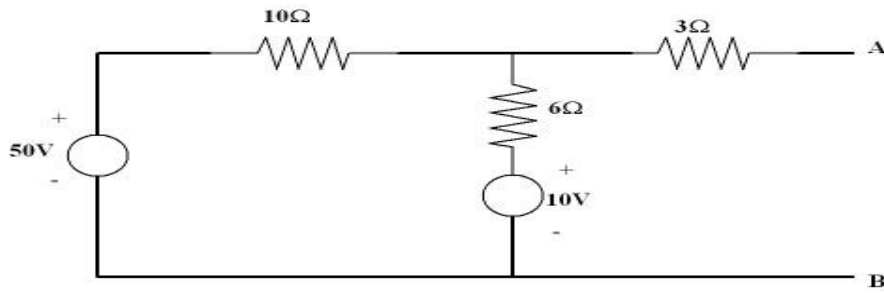   (c) instantaneous power in the circuit   (d) mean power in the circuit

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PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

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11. Using the node voltage analysis, find all the node voltages and currents in 1/3 *ohm* and 1/5 *ohm* resistances of figure.   (8)
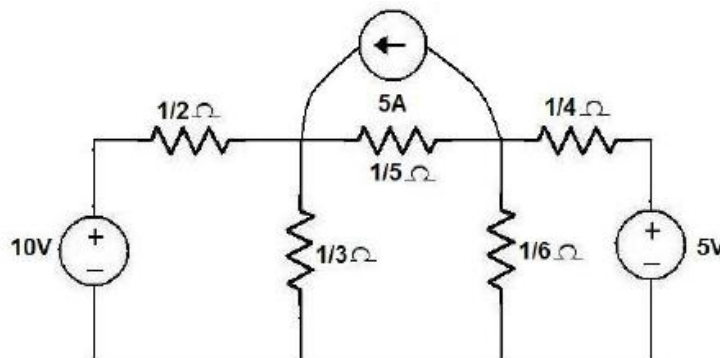
12. Find Thevenin's equivalent circuit for the circuit shown below.   (8)

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13. Describe the condition for resonance in a series RLC circuit and derive an expression for resonant frequency and frequency at which voltage across capacitor is maximum. Also draw the resonance curve and explain the values for the following parameters at resonance (i) phase angle (ii) current (iii) impedance (iv) admittance and (v) power factor. (8)

14. A series RLC circuits has R = 50 *ohm*, L = 0.2*H*, and C = 50 μF. Constant voltage of 100*V* is impressed upon the circuit at t = 0. Find the expression for the transient current assuming initially relaxed conditions. (8)

15. Using phasor diagram, formulate the relationship between line current and phase current related to delta connected load. (8)

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