Question Paper Code: 33504

B.E. / B.Tech. DEGREE EXAMINATION, AUGUST 2021

Third Semester

Electronics and Instrumentation Engineering

01UEI304 - ELECTRICAL CIRCUITS AND NETWORKS

(Common to Instrumentation and Control Engineering)

(Regulation 2013)

Duration: 1:45 hour   Maximum: 50 Marks

PART A - (10 x 2 = 20 Marks)

**(Answer any ten of the following questions)**

1. State Ohm's law.

2. Give the advantages of sinusoidal alternating quantity.

3. Find the equivalent voltage source for a current source of 15*A* when connected in parallel with 5 *ohm* resistance.

4. Define Maximum power transfer theorem.

5. Define quality factor of a series resonant circuit.

6. Define coefficient of coupling.

7. What is meant by transient response?

8. State the time constant of the DC response of an *RL* circuit.

9. Define power and power factor.

10. A three phase balanced star connected load has 400*V* line to line voltage and 10*A* line current. Determine the line to neutral voltage and phase current.

11. State Kirchhoff's law.

12. How to find the current through any branch by using current division rule?

13. State reciprocity theorem.

14. State the condition to find the maximum power using maximum power transfer theorem.
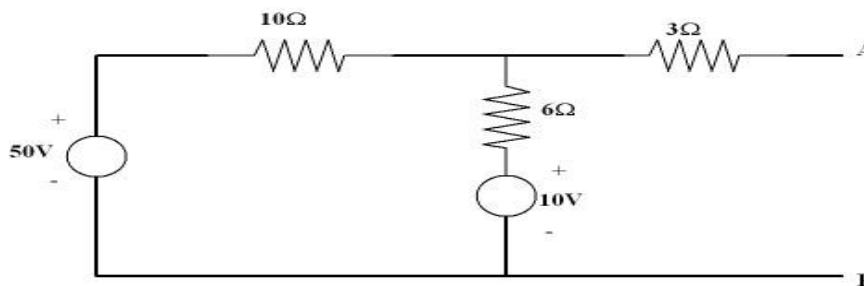
15. Define coefficient of coupling.

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PART – B (3 x 10= 30 Marks)

(Answer any three of the following questions)

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16.   Using the node voltage analysis, find all the node voltages and currents in 1/3 *ohm* and 1/5 *ohm* resistances of figure.   (10)
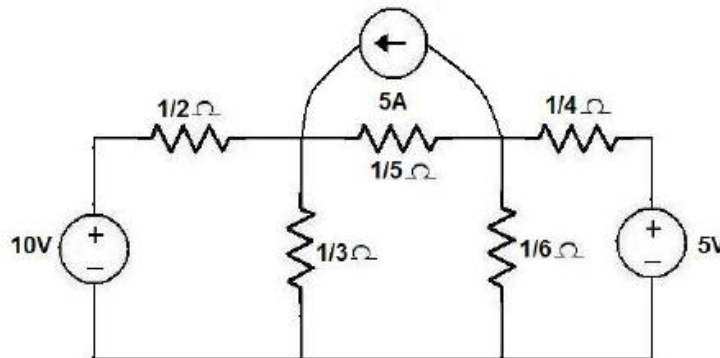
17.   Find Thevenin's equivalent circuit for the circuit shown below.   (10)

18.   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.   (10)

19.   A series RLC circuits has $R = 50$ *ohm*, $L = 0.2H$, and $C = 50$ μF. Constant voltage of $100V$ is impressed upon the circuit at t = 0. Find the expression for the transient current assuming initially relaxed conditions.   (10)

20.   Using phasor diagram, formulate the relationship between line current and phase current related to delta connected load.   (10)

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