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Question Paper Code: 33054

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Third Semester

Electronics and Instrumentation Engineering

01UEI304 - ELECTRICAL CIRCUITS AND NETWORKS

(Common to Instrumentation and Control Engineering)

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

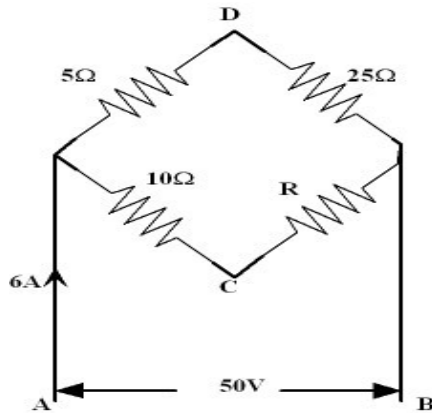
Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. State Ohm's law.
2. State Kirchhoff's law.
3. State reciprocity theorem.
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. Summarize h parameter and give its applications.
9. Compare three-phase star connected system with delta connected system.
10. Define power and power factor.

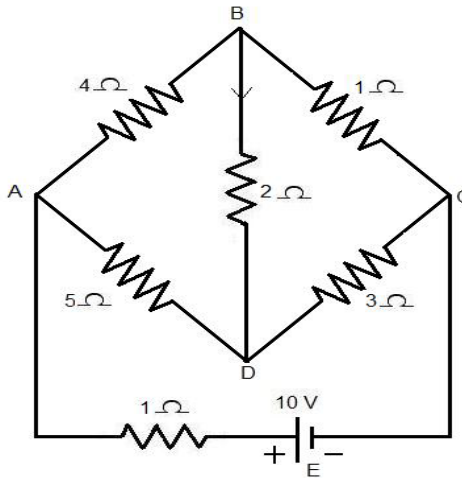
PART - B (5 x 16 = 80 Marks)

11. (a) Determine the value of resistance R and current in each branch when the total current taken by the circuit shown below is $6A$. (16)

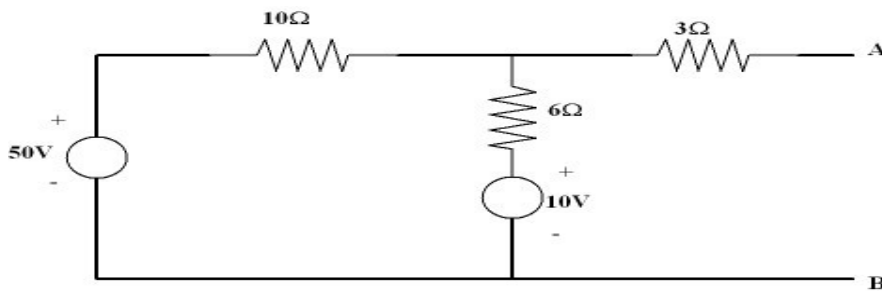


Or

- (b) In the network shown below, identify the voltage across 2Ω resistor and the total current delivered by the battery using Kirchoff's laws. (16)

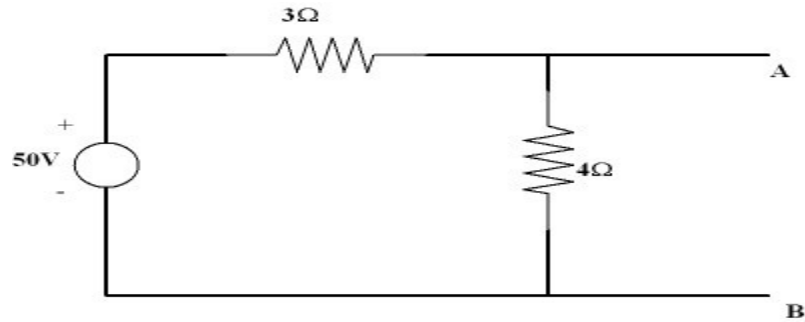


12. (a) Find Thevenin's equivalent circuit for the circuit shown below. (16)



Or

(b) Determine Norton's equivalent circuit for the circuit shown below.



(16)

13. (a) 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. (16)

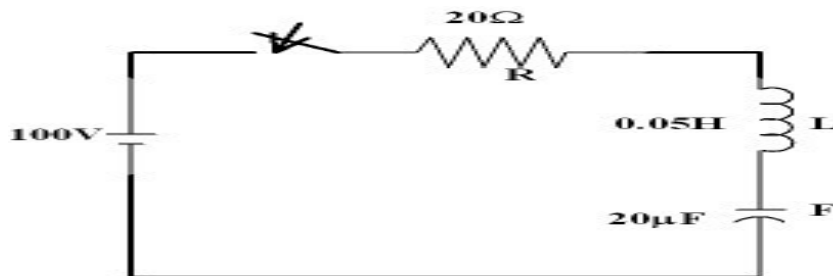
Or

- (b) Explain how to derive the amplification factor and to show the variation of the output voltage with frequency for different coupling coefficients of double tuned coupled circuits. (16)

14. (a) A series RLC circuits has $R = 50 \text{ ohm}$, $L = 0.2H$, and $C = 50 \mu F$. Constant voltage of $100V$ is impressed upon the circuit at $t = 0$. Find the expression for the transient current assuming initially relaxed conditions. (16)

Or

- (b) The circuit shown below consists of resistance, inductance and capacitance in series with a $100V$ constant source when the switch is closed at $t=0$. Find the current transient. (16)



15. (a) Explain the three phase power and power factor measurement by two wattmeter method with neat circuit and phasor diagrams. (16)

Or

- (b) The wattmeter shows the readings $400W$ and $-35W$. Calculate (i) total active power (ii) power factor and (iii) reactive power by using two wattmeter method for three phase load. (16)
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