Reg. No. :

Question Paper Code: 33504

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

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 Kirchhoff's law.

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

3. State reciprocity theorem.

4. State the condition to find the maximum power using maximum power transfer theorem.

5. Define coefficient of coupling.

6. Define coefficient of coupling.

7. What is meant by transient response?

8. Infer transient response.

9. Interpret Line voltage and phase voltage in a three phase electrical circuit.

10. List the methods of power measurements.

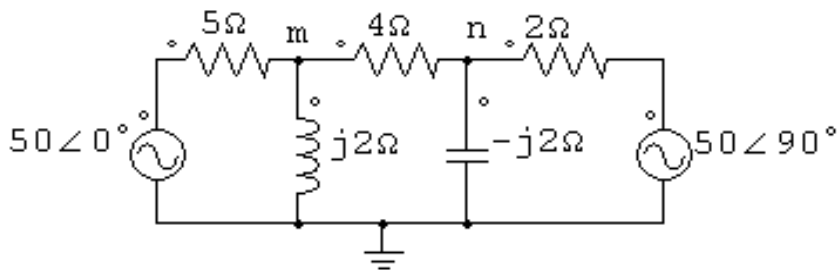11. (a) (i) What is the voltage across A and B in the circuit shown below?   (8)
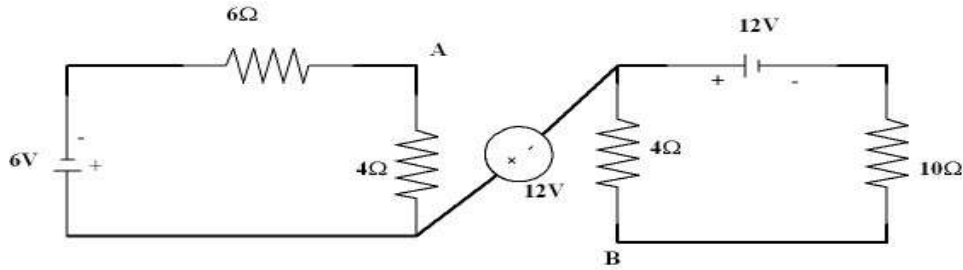
(ii) Determine the value of resistance R and current in each branch when the total current taken by the circuit shown below is 6A.   (8)
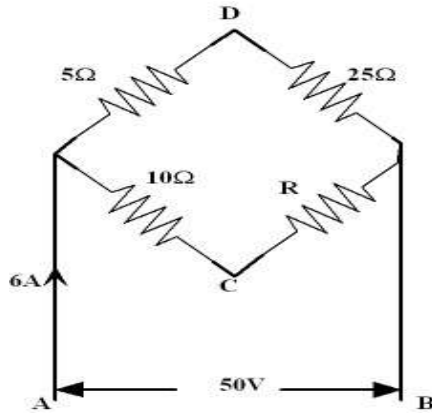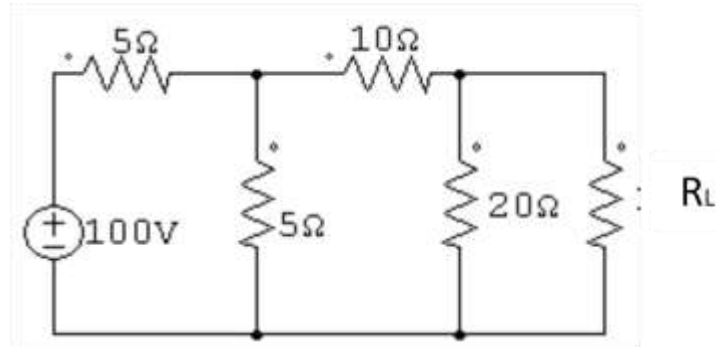

Or

(b) Using nodal voltage method, calculate the voltages of nodes 'm' and 'n' and currents through $j2\Omega$ and $-j2\Omega$ reactance in the network.   (16)
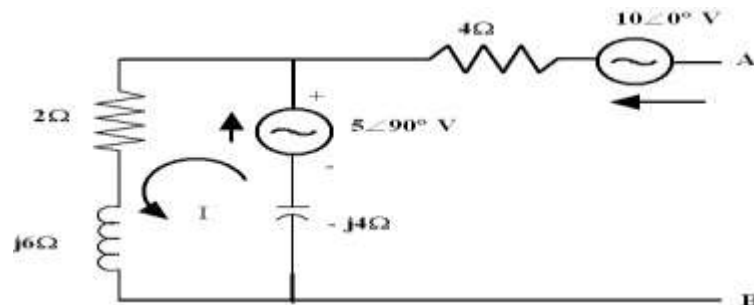
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12. (a) Determine the value of RL so that maximum power is delivered to the load resistance R_L.

(16)

Or

(b) For the circuit shown below, determine Thevenin's equivalent circuit. (16)

13. (a) Discuss about series resonance and parallel resonance in detail. (16)

Or

(b) (i) For the given circuit constants, find (i) Mutual Inductance (ii) Find equivalent inductance for all the combination $L1 = 0.02H$, $L2 = 0.01H$ and $k = 0.5$. (8)

(ii) Calculate the mutual inductance of two coils of self - inductances $100\mu H$ and $240\mu H$, which are connected in series to yield a total inductance of $146\mu H$. (8)

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14. (a) Formulate the expression for step response of RLC series circuit for critical damping condition. (16)

Or

(b) Derive an expression for current response of RL and RC series circuit transients. (16)

15. (a) A three phase balanced delta connected load (4+j8) Ω is connected across a 400V, three phase balanced supply. Determine the phase currents and line currents. Assume the phase sequence to be RYB. Also calculate the power drawn by the load. (16)

Or

(b) (i) Explain about a balanced three phase system star connected load. (8)

(ii) Explain about a unbalanced three phase system delta connected load. (8)

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