

Printed Pages : 4



NEE101/NEE201

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : **199130**

Roll No.

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B. Tech.

(SEM. I) (ODD SEM.) THEORY
EXAMINATION, 2014-15
ELECTRICAL ENGINEERING

Time : 3 Hours]

[Total Marks : 100

- 1 Attempt any FOUR parts : 5×4=20
- Why proper Earthing is necessary? What is the importance of earth's resistance value?
 - Write detailed note on importance of electrical safety issues.
 - State the dot convention for mutually coupled coil in terms of the flux direction.
 - Derive the induced emf-flux relationship of the transformer.
 - What is transformer? Explain the constructional features of different types of transformer.
 - Write detailed note on Hysteresis loss and Eddy current loss in magnetic circuit and also state how to reduce the eddy current loss considerably.

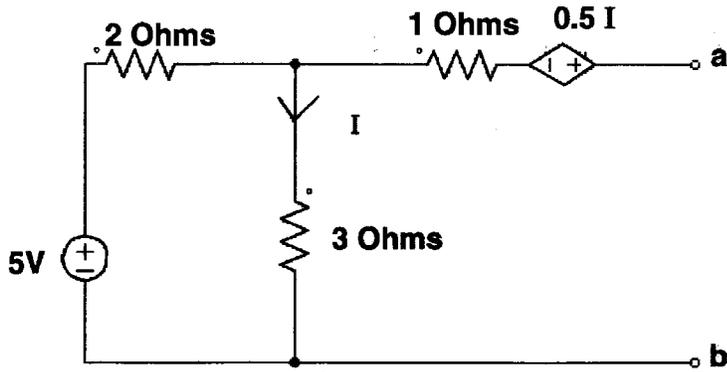
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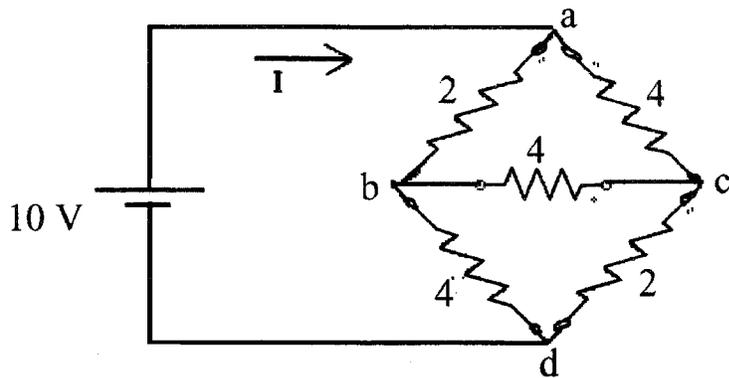
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2 Attempt any TWO parts : 10×2=20

a) Deduce Thevenins equivalent between the terminals a and b from the given circuit.



b) Using Star-delta transformation, find the current in the branch b-c of the circuit. Consider all the values of resistances are in Ohms.

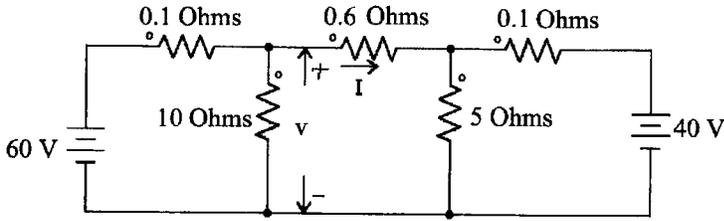


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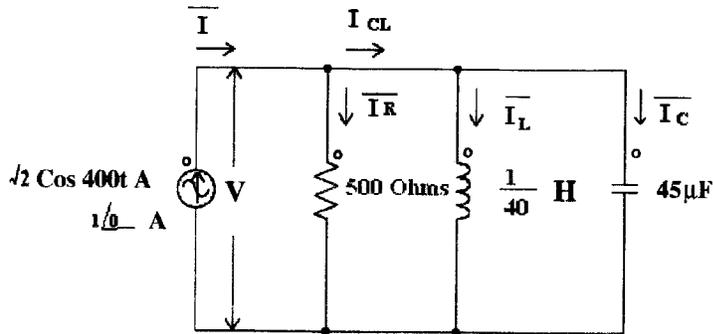
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- c) Find V and I in the given circuit by using Superposition theorem



3 Attempt any TWO parts : 10×2=20

- a) Derive the quality factor of the Parallel RLC circuit at resonance.
- b) In the given parallel RLC circuit, determine $i_R(t)$, $i_L(t)$ and $i_C(t)$ and $i_{CL}(t)$. Determine the phasor diagram showing all currents and voltage.



- c) A series RLC circuit is composed of 10Ω resistance, 0.1 H inductance and $50 \mu\text{F}$ capacitance. A voltage $V(t)=141.4 \text{ Cos}(100\pi t) \text{ V}$ is impressed upon the circuit. Determine (i) the expression for instantaneous current, (ii) the voltage drops V_R , V_L and V_C across Resistor capacitor and inductor, (iii) draw the phasor diagram using all the voltage relations.

4 Attempt any TWO parts **10×2=20**

- a) Describe the construction and working of PMMC instrument and also derive the equation for deflection if the instrument is spring controlled.
- b) A balanced delta connected load impedance $16+j12\ \Omega$ /phase is connected to a three phase 400V supply. Find the phase current, line current, power factor, active power, reactive power and total power. Also draw the phasor diagram.
- c) A 1mA meter d'Arsonval movement with an internal resistance of $100\ \Omega$ is to be converted into a 0-100mA ammeter. Calculate the value of shunt resistance and voltage drop across the shunt resistance.

5 Attempt any TWO parts : **10×2=20**

- a) Write the expression for the induced emf and torque of a dc machine. What is the value of the constant relating ω and n ?
- b) A 6.6kV, 20-poles, 50 HZ, 3 phase star-connected induction motor has rotor resistance of $0.12\ \Omega$ and a still reactance of $1.12\ \Omega$. The motor has a speed of 292.5 rpm at full load. Calculate the slip at maximum torque.
- c) Illustrate the operating principle of synchronous motor with suitable figures.

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