

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

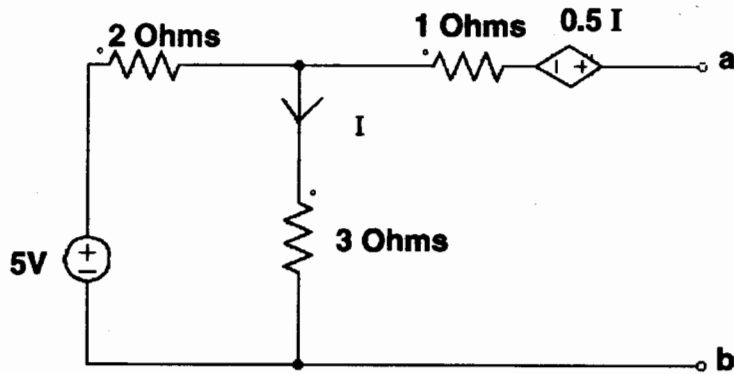
Time : 3 Hours]

[Total Marks : 100

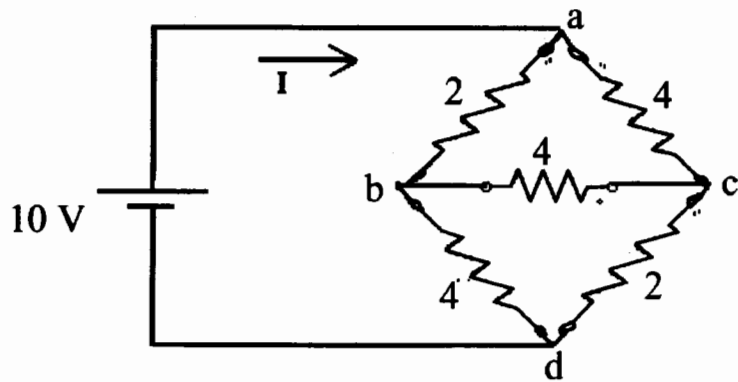
- 1 Attempt any FOUR parts : 5×4=20
- a) Why proper Earthing is necessary? What is the importance of earth's resistance value?
 - b) Write detailed note on importance of electrical safety issues.
 - c) State the dot convention for mutually coupled coil in terms of the flux direction.
 - d) Derive the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

2 Attempt any TWO parts : $10 \times 2 = 20$

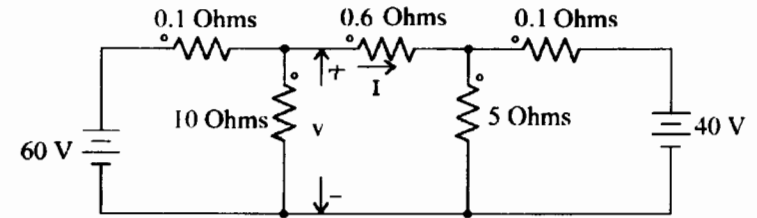
- a) Deduce Thevenin's equivalent between the terminals a and b from the given circuit.



- 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.

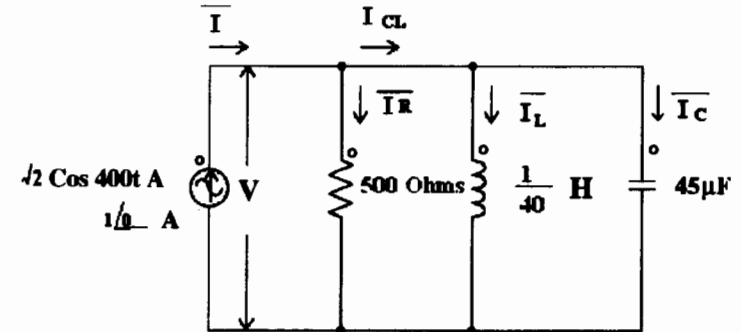


- c) Find V and I in the given circuit by using Superposition theorem



3 Attempt any TWO parts : $10 \times 2 = 20$

- 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 $V(t) = 141.4 \cos(100\pi t) \text{ V}$ 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.

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 0.12Ω and a still reactance of 1.12Ω . 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.