



UA-6007

B. E. (Sem. I And II) (All Branches) Examination
April/May – 2012
Electrotechniques

Time : Hours]

[Total Marks : 100

Instructions :

(1)

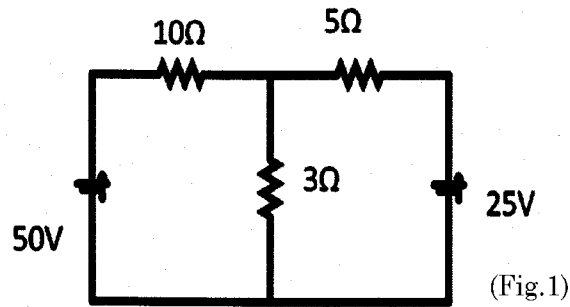
नीचे दशांशवैध निशान्तीवाणी विगतो उत्तरवडी पर अवश्य लपवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="B. E. (SEM. 1 AND 2) (ALL BRANCHES)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="ELECTROTECHNIQUES"/>	<input type="text"/>
Subject Code No. : <input type="text" value="6"/> <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="7"/>	<input type="text"/>
Section No. (1, 2,.....): <input type="text" value="Nil"/>	<input type="text"/>
	Student's Signature

- (2) Attempt all questions.
(3) Figures to the right indicate full marks.
(3) Assume suitable data if necessary.

- 1(a) Answer the following questions 10
- 1 Define : MMF
 - 2 Explain Kirchoff's Current Law.
 - 3 Define: Capacitance
 - 4 What is an Ideal Current source?
 - 5 Admittance is defined as reciprocal of _____ and has unit _____.
- (b) State "True" or "False" for the following sentences. 5
- 1 Potential can also be expressed in Joules/coulombs.
 - 2 Resistance is the property of the material.
 - 3 Charge of $6.25 \times 10^{+18}$ electrons is 01 coulomb.
 - 4 Ideal current source is having assumed to have infinite internal resistance in parallel with it.
 - 5 Unit of Mutual inductance is Henry.
- (C) Explain Ohm's law and state properties of resistance. 05
- 2(a) State and explain Thevenin's theorem. 8

(b) Solve the following using any network theorem to find current in each branch.

7



OR

2(a) State and explain Faraday's law of Electromagnetic induction.

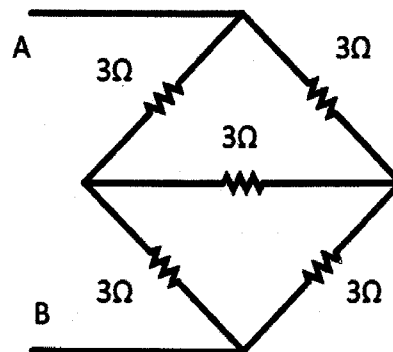
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(b) Explain self inductance of a coil and hence derive the expression for self inductance of a coil.

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(c) For the circuit shown below find the equivalent resistance between terminals 'A' and 'B'.

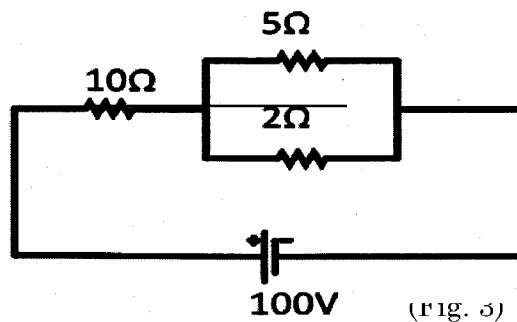
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Q.3 Attempt and "Three"

1 Find equivalent resistance and current through each branch in the following circuit.



2 Derive expression for star to delta transformation for resistance network.

- 3 Derive the expression for the energy stored in a capacitor.
- 4 Derive the expression $K = \frac{M}{\sqrt{L_1 L_2}}$ with usual notations.
- 4(a) Answer the following questions 10
- 1 In case of balanced three phase system, $V_R + V_Y + V_B = \text{-----}$
 - 2 Define : Q- factor.
 - 3 Admittance is inverse of _____
 - 4 Unit of capacitive reactance is _____.
 - 5 For pure inductive circuit, average power consumed is _____
 - 6 Define: Time period
 - 7 At resonance of series R-L-C circuit, the current is _____
 - 8 If $R=10\Omega$ and $X_L = 5\Omega$. The phase angle in electrical degrees is _____
 - 9 If $R= 10 \Omega$ and phase angle is 30 degree lagging , Value of $Z= \text{-----}$ ohm.
 - 10 Define : Power factor
- (b) State "True" or "False" for the following sentences. 5
- 1 Using two wattmeter method, reactive power cannot be measured.
 - 2 Inverse of resistance is called conductance.
 - 3 'Phase' can be measured in radians.
 - 4 At resonance series R-L-C circuit behaves as purely resistive circuit.
 - 5 Power factor can be shown as ratio of resistance to impedance of the circuit.
- (c) Derive expression for RMS value of sinusoidal waveform. 5
- 5(a) Two impedances of value $1+j1\Omega$ and $0-j5\Omega$ are connected in parallel across 200V, 50 Hz supply. Find total current of the circuit, current in each branch, p.f of the circuit and power consumed by the circuit. 8
- (b) Explain resonance in series R-L-C circuit and derive the expression $f_c = \frac{1}{2\pi\sqrt{LC}}$, with usual notations. 7
- OR
- 5(a) Derive expression for current, impedance, power factor and power in case of R-L series circuit fed with alternating supply. 7
- (b) In case of an R-L series circuit, if voltage applied is 200V, 50 Hz, current in the circuit is 5A, and p.f. is 0.8 lag, find value of R, L, power consumed by the circuit and voltage across each element. 8

- 1 A Three phase load connected with two watt meter method to measure power. If total power of the load is 10 KW and p.f. is 0.8 lag, find reading of each wattmeter and reactive power consumed by the load.
 - 2 Discuss resonance in series R-L-C circuit.
 - 3 Explain two wattmeter method for measurement of three phase power.
 - 4 Determine relationship between line value and phase value in case of three phase balanced delta connected load.
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