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24007

B.Tech. 1st Semester Examination,

December-2012

ELECTRICAL TECHNOLOGY

Paper-EE-101-F

Time allowed : 3 hours]

[Maximum marks : 100

- Note :** (i) *Question No. 1 is compulsory from Section-A.*
(ii) *Attempt four questions from remaining four sections selecting one question from each section.*
(iii) *Use of non programmable calculator is allowed.*

Section-A

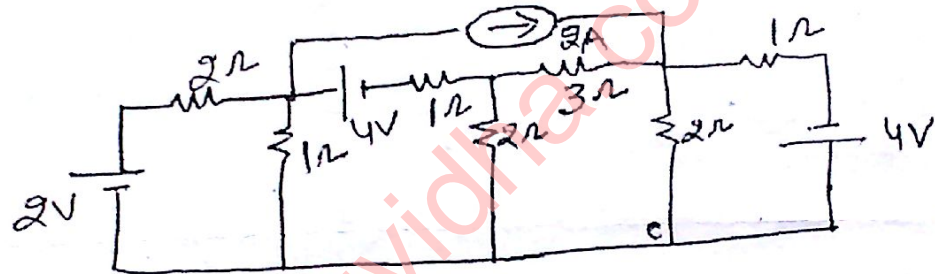
1. (i) Distinguish between unilateral and bilateral Network. 4
(ii) How the rotor of DC Motor rotate ? 4
(iii) Derive the e.m.f. equation for 1-phase transformer. 4
(iv) Write short note on deflecting torque in measuring instruments. 4
(v) Explain the significance of power triangle in AC system. 4

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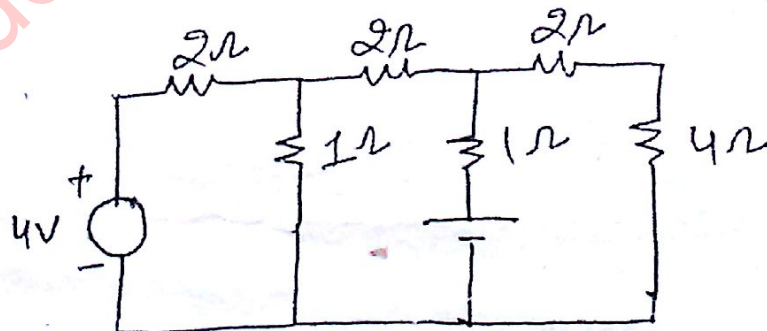
[P.T.O.]

Section-B

2. (a) Explain the Kirchhoff's voltage law and current law with some suitable example. 10
- (b) Find the value of current flowing through 3 ohm resistance in the given circuit by using Nodal Analysis. 10



3. (a) Find the value of current flowing through 4 ohm resistance in the given circuit by using Thevenin's theorem. 10



- (b) State and explain maximum power transfer theorem with some suitable example. 10

Section-C

4. (a) Define and explain the terms given below : 10
- (i) RMS values and
 - (ii) Average values of an AC sinusoidal signal.
- (b) An inductive ckt of resistance 3Ω , and inductance 0.02H is connected to a 230V , 50Hz supply. What value of capacitance be placed in parallel with the inductive ckt will produce resonance ? Also find current taken from supply at resonance. 10
5. A coil which has 6 ohm and 25.5 mH inductance is energized from a 220 V , 50 Hz supply. (i) Calculate the current (ii) A capacitor is then connected in parallel with the coil so that the overall power factor is raised to unity. Calculate the capacitance of the capacitor. 20

Section-D

6. (a) Explain two wattmeter method of power measurement in 3-phase AC system at balanced load. 10
- (b) Derive the relation between Line voltage and phase voltage, Line current and phase current for star connection in 3-phase system. 10

7. Draw and explain the Circuit diagram and Phasor diagram of single Phase Practical transformer diagram at resistive load. 20

Section-E

8. (a) Explain how the revolving flux is produced in the stator of 3-phase induction motor. 10
- (b) Prove that 1-phase induction is not self starting. Explain the starting methods. 10
9. (a) Explain the construction and working of Energy Meter. 10
- (b) A 240 V single phase energy meter has a constant load current of 10 A at unity power factor. If the meter disc makes 1155 revolution during 3 hours, calculate the meter constant. If the power factor were 0.85, what would be the number of revolutions made by the disc in that time ? 10