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.*
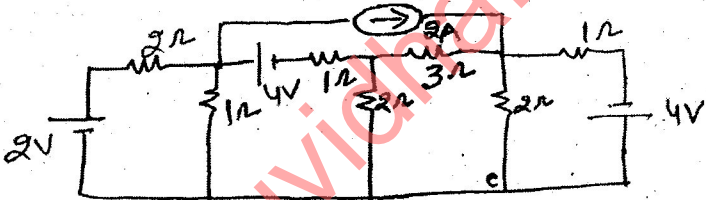
Section–A

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
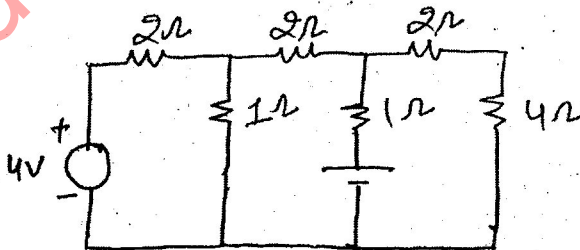
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Section–B

2.   (a)   Explain the Kirchoffs 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

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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

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