II B.Tech II Semester Examinations,APRIL 2011
ELECTRICAL AND ELECTRONICS ENGG.
Aeronautical Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) State & explain Ohm's law. What are the limitations of Ohm's law?

   (b) Give examples of linear bi-lateral Elements.

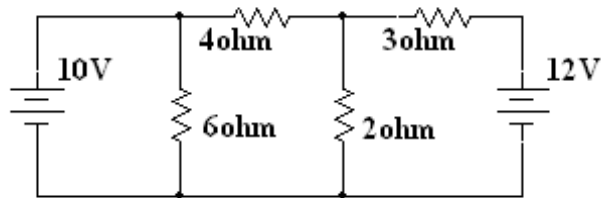   (c) In following circuit Figure 1 find the power across 2 ohm resistance. [6+3+7]

Figure 1

2. (a) List the different types of instruments used for making voltmeters and ammeters.

   (b) Explain the construction and working of a Permanent Magnet Moving Coil Instrument. [6+10]

3. (a) Obtain the ratio of Maximum torque to Full load torque & Maximum torque to staring torque.

   (b) A 4-pole, 50 Hz, 3-Φ IM has rotor impedance of $0.04 + j\,0.16\ \Omega$. Calculate the value of external rotor resistance to be inserted in rotor circuit to obtain 70 % of maximum torque at starting. [8+8]

4. Obtain the approximate equivalent circuit of transformer from its exact equivalent circuit and derive all related equations. [16]

5. (a) Explain the input and output characteristics of a transistor in CB configuration.

   (b) In a CB connection, current amplification factor is 0.9. If the emitter current is 1mA, determine the base current. [8+8]

6. (a) Derive the EMF equation of DC Generator.

   (b) An 8 pole DC generator has per pole flux of 40mWb and winding is connected in lap with 960 conductors. Calculate the generated EMF on open circuit when it runs at 400 rpm. If the armature is wave wound at what speed must the machine be driven to generate the same voltage. [8+8]

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7. (a) Explain the operation of a centre-tap full-wave rectifier.

 (b) A FWR using two diodes, the internal resistance of diode is 20Ω. The transformer rms secondary voltage from center-tap to each end of secondary is 50V and load resistance is 1k Ω, find   [8+8]

  i. I_{dc} and
  ii. I_{rms}.

8. (a) Explain the applications of CRO .

 (b) In a CRT, the deflection plates are 3cm long and are spaced 1cm apart. The screen is 10cm away from the centre of the deflecting plates. The final anode voltage is 600v. Calculate   [8+8]

  i. the velocity of the beam on emerging from the field and
  ii. the voltage that must be applied to the deflecting plates to have a displacement of 1cm.

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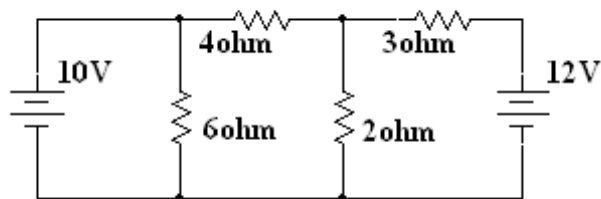

Figure 2

3. (a) Explain the operation of a centre-tap full-wave rectifier.

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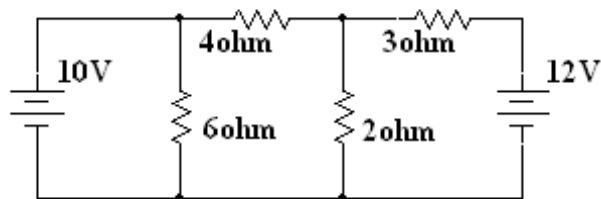   (c) In following circuit Figure 3 find the power across 2 ohm resistance. [6+3+7]

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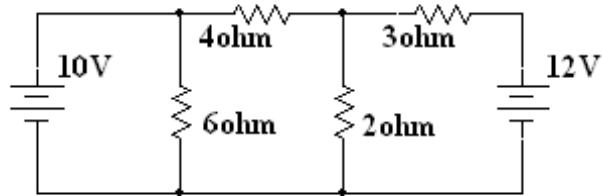(c) In following circuit Figure 4 find the power across 2 ohm resistance. [6+3+7]

Figure 4

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