

Code No: RA 07A3EC01

RA

**III B.Tech I Semester(R07) Supplementary Examinations, May 2011**  
**ELECTRICAL AND ELECTRONICS ENGINEERING**  
**(Civil Engineering)**

Time: 3 hours

Max Marks: 80

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

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1. (a) Define the following terms and also give their units.
  - i. Voltage
  - ii. Current
  - iii. Power
  - iv. Energy
 (b) If 70 Joules of energy is available for every 30 coulombs of charge, what is the voltage?  
 (c) What is the power in watts if energy equal to 50 Joules is used in 2.5 Seconds? [8+4+4]
2. A 4-pole motor has wave connected armature with 888 conductors. The brushes are displaced backward through 5 angular degrees mechanical from geometrical neutral. If the total armature current is 90 amperes, calculate the cross and back ampere-turns per pole. [16]
3. (a) Explain the construction and principle of operation of a single Phase transformer.  
 (b) A sinusoidal flux 0.02 Weber's (maximum) links with 55 turns of a Transformer secondary coil. Calculate the RMS value of the induced EMF in the secondary. The supply frequency is 50 Hz. [8+8]
4. A 4-pole, 50 Hz induction motor has a full load slip of 5 %. Each rotor phase has a resistance of 0.3 ohms and a stand still reactance of 1.2 ohms. Find the ratio of the maximum torque to the full load torque and the speed at which the maximum torque occurs. [16]
5. With a neat diagram explain the working of moving iron attraction type instrument. [16]
6. (a) List out the applications of tunnel diode and mention its advantages and disadvantages.  
 (b) Explain the principle and working of photodiode. [8+8]
7. Explain the following:
  - (a) Firing angle
  - (b) Conduction angle of an SCR. and
  - (c) Once the SCR is triggered, the gate loses its control. [16]
8. (a) Calculate the magnitude of frequency of a signal observed on a cathode ray oscilloscope having a time period per cycle of the signal 10 msec.  
 (b) What happens to an electron when it is exposed to parallel electric and magnetic fields?  
 (c) Derive the expression for transit time  $\tau$  (tow) and final velocity V in the case of an electron traversing in uniform electric field E. [4+8+4]

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