

I B.Tech Year(R07) Supplementary Examinations, May/June 2010**BASIC ELECTRICAL ENGINEERING**

(Common to Computer Science & Engineering, Information Technology and Computer Science & Systems Engineering)

Time: 3 hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) State ohms law. What are its limitations?
(b) Derive an expression for the effective resistance of three resistors connected in series.
(c) Derive an expression for the effective resistance of three resistors connected in parallel. [4+6+6]
2. What is [2+2+2+2+2+2+2+2+2]
 - (a) A practical voltage source
 - (b) A practical current source
 - (c) Dependent source
 - (d) Independent source
 - (e) VCVS
 - (f) VCCS
 - (g) CCVS
 - (h) CCCS.
3. (a) Write short notes on :
 - i. Paramagnetic substances
 - ii. Diamagnetic substances
 - iii. Soft magnetic materials
 - iv. Hard magnetic materials.(b) Briefly explain the hysteresis loop of a magnetic material and discuss its significance. [8+8]
4. Explain the behaviour of ac through
 - (a) Pure R
 - (b) Pure L
 - (c) Pure C circuits.

For each case derive the instantaneous value of V and I, Impedance, Average power, Power factor, Instantaneous power and the relevant phasors.
5. (a) Explain the principle of working of a single phase transformer.
(b) Derive from the first principles the emf equation for a single phase transformer. [8+8]
6. (a) Derive the expression for the armature torque and shaft torque of a dc motor.
(b) The armature of a 6 pole, 6 circuit, dc shunt motor takes 300 A at the speed of 400 revolutions per minute. The flux per pole is 75mWb. The number of armature turns is 500. The torque lost in windage, friction and iron losses can be assumed a 2.5%. Calculate [6+10]
 - i. Torque developed by the armature
 - ii. Shaft torque
 - iii. Shaft power in KW.
7. Explain in detail the construction of a three phase induction motor specifying in detail the squirrel cage and slip ring rotor construction.
8. What do you understand by attraction type and repulsion type instruments?
