Code: EE1T6

I B.Tech - I Semester – Regular / Supplementary Examinations
December - 2016

INTRODUCTION TO ELECTRICAL ENGINEERING
(ELECTRICAL AND ELECTRONICS ENGINEERING)

Duration: 3 hours   Max. Marks: 70

PART – A

Answer **all** the questions.   All questions carry equal marks

                                                      11 x 2 = 22 M

1.
   a) Define the term specific resistance and mention its units.
   b) Mention the Kirchhoff's laws.
   c) What is meant by heating effect of electric current?
   d) Define mechanical work and energy.
   e) Derive the equation for energy stored in a capacitor.
   f) What are the coulomb's laws?
   g) Define lenz's law and mention where we are applying?
   h) Write the analogy between electric and magnetic circuits.
   i) What is the significance of ampere hour & watt hour of a battery?
   j) Mention the methods of production of Dynamically induced Emf.
   k) Derive formula for co-efficient coupling in magnetic circuits.

PART – B

Answer any **THREE** questions. All questions carry equal marks. $\qquad$ 3 x 16 = 48 M

2. a) Explain the effect of temperature on temperature co-efficient. $\qquad$ 8 M

   b) A specimen of copper wire has a specific resistance of $1.72*10^{-6}$ ohm-cm at 0^0C and has a temperature co-efficient (1/264.5) at 30^0C. Find the temperature co-efficient and specific resistance at 80^0C. $\qquad$ 8 M

3. a) Obtain the relationship between thermal, electrical and mechanical units. $\qquad$ 8 M

   b) Two heaters A and B are in parallel across the supply voltage 230V. Heater A produces 500 Kcal in 20 minutes and B produces 1000kcal in 10 minutes. The resistance of heater A is 10Kohm. What is resistance of heater B? If the same heaters are connected in series, how much heat will be produced in 5 minutes? $\qquad$ 8 M

4. a) Explain the charging and discharging process of capacitor with DC and AC supply. $\qquad$ 8 M

   b) Three capacitors A, B, C have capacitances 10, 50, 25 micro farads respectively. Calculate : $\qquad$ 8 M

i) charge on each when connected in parallel to 250V.

ii) Total capacitance

iii) potential difference across each when connected in series to 250V supply.

5. a) Explain the concept of magnetic hysteresis and also explain the factors effecting the shape and size of hysteresis loop.

8 M

b) Derive the expression for equivalent inductance when two inductance are connected in parallel with magnetic aiding.

8 M

6. a) Describe the characteristics and chemical changes during charging and discharging in lead acid cell.   8 M

b) Explain the operating principle of DC machines and explain which type of induced Emf is produced in DC generator.   8 M