Combined First and Second Semester B.Tech. Degree Examination, May 2009
08-108 : BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(2008 Scheme)

Time: 3 Hours
Max. Marks: 100

Instructions: 1) Answer all questions from Part – A and three full questions from Part – B.
2) Choosing not more than one question from each Module.

PART – A

1. Explain Kirchoff’s Laws.

2. What is Lenz’s Law ? Explain.

3. Distinguish between Phase and Phase difference.

4. What is the principle of operation of transformer ?

5. Name eight substation equipment.

6. Differentiate between MCB and ELCB.


9. What are energy efficient lamps ? Explain any one.

10. What are transducers ? Explain.
PART - B

MODULE - I

11. a) Solve for currents $I_1$, $I_2$ and $I_3$ using mesh current method.

\[ \text{Diagram with labeled components:} \]

b) A magnetic circuit comprises three parts in series, each of uniform cross sectional area. They are
   a) a length of 80 mm and cross-sectional area 50 mm$^2$
   b) a length of 60 mm and cross-sectional area 90 mm$^2$
   c) an air gap of length 0.5 mm
   A coil of 4000 turns is wound on part b and flux density in the air gap is 0.3 T. Assuming that all the flux passes through the given circuit and that the $\mu_r$ is 1300. Estimate the coil current to produce such a flux density.

12. a) Prove that in a purely inductive circuit average power consumed is zero, when connected to a single phase a.c.

b) A capacitor of 8\(\mu\)F takes a current of 1.0 A when the a.c. voltage applied across it is 230 V. Calculate:
   a) Frequency of applied volt.
   b) The resistance to be connected in series with capacitor to reduce the current in the circuit to 0.5 A at the same frequency.
   c) The phase angle of the resulting current.
MODULE – II

13. a) Draw the block schematic of a nuclear power plant and explain.

   b) What is the need for high transmission voltage? Draw a typical power transmission scheme.

14. a) What are the different protective devices used in electrical installations? Explain any one in detail.

   b) Explain constructional details of single phase and 3-phase transformers.

   10

MODULE – III

15. a) Explain the working of zener voltage regulator?

   b) Explain the action of shunt capacitor filter.

   c) Describe the working of UPS with a neat block diagram.

   7

16. a) Draw and explain the VI characteristics of SCR.

   b) With the help of block diagram explain how to produce a 9V DC power supply from 230 V, 50 Hz a.c. supply.

   c) Explain the working principle of photodiodes and solar cells.