Combined First And Second Semester B.Tech. Degree Examination, April 2016  
(2008 Scheme)  
08-108 : BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Time : 3 Hours
Max. Marks : 100

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

PART – A

1. Explain Faraday’s and Lenz’s law.

2. Define the terms ‘field strength’ and ‘reluctance’ in a magnetic circuit.

3. A coil of 1500 turns gives rise to a magnetic flux of 2.5 m Wb, when carrying a certain current. If this current is completely reversed in 0.2 second. What is the average emf induced in the coil ?

4. Derive an expression for rms and average value or a sinusoidal current wave form.

5. Distinguish between active and reactive power.

6. Write the principle of operation of a single phase transformer.

7. Explain the necessity of earthing in a electrical installation.

8. Explain the working of fluorescent lamp.

9. Write the applications of transducers and working of a resistance strain gauge.

10. Explain the working of zener voltage regulator. (10×4=40 Marks)
PART – B

Module – I

11. a) Derive the expression for power in a purely capacitive circuit.
   b) An alternating current varying sinusoidally with a frequency of 50 Hz has a
      rms value of 10 A. At what time measured from negative maximum value, the
      instantaneous current will be $5\sqrt{2}$ A?
   c) A choke coil is connected to 230 V, 50 Hz supply. An ammeter is connected in
      series with the choke coil reads 20 A. On increasing the frequency to 100 Hz,
      the same ammeter reads 10 A. Calculate the resistance and inductance of
      the coil.

12. a) Derive the expression of voltage, current, power and powerfactor for a
      3-phase star-connected balanced system.
   b) Draw and explain the working of single phase energy meter.

Module – II

13. a) A 40 kVA, 1600/200 volts transformer has 110 turns on secondary, calculate
      (i) number on turns on primary winding (ii) secondary current on full load
      (iii) the cross-sectional area of the core, if the maximum flux density is 1.2
      tesla.
   b) Briefly discuss about any four methods on non-conventional energy sources.
   c) Explain a typical power transmission and distribution scheme in a power
      system.

14. a) Explain the different equipments used in a substation.
   b) Draw the schematic wiring diagram of an LT installation.
   c) Compare the use of a ordinary type fuse and a miniature circuit breaker in LT
      installation.

Module – III

15. a) Explain the static characteristic of a silicon junction diode.
   b) Discuss the VI characteristic of zener diode.
   c) With the block diagram explain the working of UPS.

16. a) Draw and explain the working of a full wave bridge rectifier with resistive load
      and derive the expression for $V_{dc}$ and $V_{rms}$.
   b) Write short notes on the following:
      i) SCR and Triac ii) SMPS iii) Thermistor iv) LVDT.