

**R09****Code: 9A02304**

B.Tech II Year I Semester (R09) Supplementary Examinations, May 2013

**BASIC ELECTRICAL & ELECTRONICS ENGINEERING**

(Biotechnology)

Time: 3 hours

Max. Marks: 70

All questions carry equal marks

A total of five questions are to be answered with at least two questions from each part

Use separate booklets for Part A and Part B

\*\*\*\*\*

**PART - A**

- 1 (a) State and explain Kirchoff's laws.  
(b) Explain any one passive element in detail.
- 2 (a) Define and derive the expression for average value of a sinusoidal voltage wave form.  
(b) Show that power dissipated by a pure inductive circuit excited by a sinusoidal voltage source is zero.
- 3 Derive the relation between phase and line values of a 3-phase balanced delta connected system with neat phasor diagram and also derive the expression for power in a 3- $\phi$  balanced delta connected systems.
- 4 (a) Explain the characteristics of DC generators.  
(b) Explain the principle of operation of 3-phase induction motors.

**PART - B**

- 5 (a) What is a PN junction diode? Draw and explain the  $v - i$  characteristics of a junction diode when it is as forward biased and reverse biased.  
(b) Draw and explain the principle of operation of half wave rectifier.
- 6 (a) Explain the input and output characteristics of a transistor in CE configuration.  
(b) What are the necessary conditions for an oscillator to give sustained oscillations?
- 7 (a) Explain the basic principle of operation of dielectric heating.  
(b) What is welding? What is meant by resistance welding?
- 8 (a) Explain the principle of operation of cathode ray tube.  
(b) Derive the expression for electrostatic deflection sensitivity of CRT.

\*\*\*\*\*