

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech. (2011 Onwards) (Sem.-1,2)**  
**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**  
Subject Code : BTEE-101  
Paper ID : [A1104]

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTION TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.
4. Select atleast TWO questions from SECTION - B & C.

**SECTION-A**

**1. Write briefly :**

- a. If impedance ( $Z = R + jX$ ) is given, write real and imaginary parts of its equivalent admittance.
- b. State and explain Kirchoff's voltage Law for DC linear circuits.
- c. Draw phasor diagram to explain relationships between voltage and current in a star connected load.
- d. Prove relationship between *r.m.s.* and mean value of sine wave.
- e. Write any four magnetic and electric circuit analogous quantities.
- f. Draw equivalent circuit of three phase induction motor.
- g. Write various functions of digital multimeter.
- h. Draw and explain characteristic of Zener diode.
- i. Convert the octal number 456 to hexadecimal number.
- j. Explain OR logic gate operation.

## SECTION-B

2. A 50 Hz sinusoidal voltage of maximum value of 400 V is applied to a series circuit of resistance  $10\ \Omega$  and inductance 0.1 H. Find the expression for the value of the current at any instant after the voltage is applied, assuming that voltage is zero at the instant of application. Calculate its value 0.02 seconds after switching on.
3. Explain principle of operation of transformer and draw its phasor diagram referred to primary winding at lagging power factor load.
4. Explain resonance in R-L-C series circuit, derive expression for resonance frequency and also use graphical method to explain resonance.
5. A 100 kW belt driven shunt generator running at 300 *r.m.p.* on 220V bus bars continues to run as a motor when the belt breaks then taking 10 kW. What will be its speed? Armature resistance is 0.025 ohm, field resistance is 60 ohm. Ignore contact drop and armature reaction.

## SECTION-C

6. Explain principle of strain gauge and its application.
7. An A.C. voltage of peak value 15 V is connected in series with a silicon diode and a load resistance of 1 k $\Omega$ . If the forward resistance of diode is 15  $\Omega$  determine :
  - a) peak value of current through diode,
  - b) peak value of output voltage. What will be the above values if the diode is assumed to be ideal?
8. Explain D and T Flip-Flops.
9. Explain through Inclusive-OR gate and give its applications.