Roll No. ....   Total No. of Pages : 2

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

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTION TO CANDIDATES :
1. SECTION-A is COMPULSORY.
2. Attempt any FIVE questions SECTION - B & C.
3. Select at least TWO questions from SECTION - B & C.

SECTION-A   (10 × 2 = 20 Marks)

l. (a) State ohm's law in reference to DC circuits.

   (b) State Kirchhoff s Current Law for a linear bilateral DC circuits.

   (c) Draw phasor diagram of a series R-L-C A.C. circuit.

   (d) Explain the term form factor of sine wave and square wave.

   (e) Prove that power on both primary as well as secondary remains same.

   (f) Draw circuit diagram long-shunted dc motor and write its V-I equations.

   (g) Explain in brief the term transducer.

   (h) Draw and explain characteristic V-I characteristic of PN junction diode.

   (i) Draw circuit diagram of field effect transistor.

   (j) Explain any truth table for NAND operation.

SECTION-B   **(8 Marks each)**

2. Derive an expression for resistance at any temperature, if resistance at t = 0°, is not known.

3. A 25 kVA loss-less transformer has 500 turns on the primary and 40 turns on the secondary winding. The primary is connected to 3000V, 50Hz mains, determine
   (i) primary and secondary currents in at full load;
   (ii) the secondary e.m.f. and
   (iii) the maximum flux in the core. No-load current can be neglected.

4. A voltage, $e(t) = 150\sin(2\pi f)t$, 50Hz, is applied to series circuit consisting of 10Ω resistance, 0.0318 henry inductance. Determine
   (i) expression for current i(t),
   (ii) phase angle between voltage and current,
   (iii) power factor,
   (iv) active power consumed,
   (v) maximum value pulsating energy.

5. Explain characteristics of DC shunt motor and its speed control methods.

SECTION-C   **(8 Marks each)**

6. Explain in detail operation of LVDT and list its field of application.

7. A full wave centre-tap rectifier uses two crystal diodes each having a forward resistance of 25Ω. The rms value of secondary voltage fed between centre tap to each end of secondary is 48V and the load resistance is 1 kΩ. Determine
   (i) d.c. output voltage,
   (ii) d.c. output power,
   (iii) rectification efficiency,
   (iv) peak inverse voltage.

8. Explain Zener diode and any one of its application.

9. Explain in detail J-K flip flop.