

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)

1. (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 $t = 0^\circ$, 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, $e(t) = 150\sin(2\pi ft)$, 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 $1\text{ k}\Omega$. 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.