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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Sem.-1st & 2nd)**BASIC ELECTRICAL****AND ELECTRONICS ENGINEERING**

Subject Code : BTEE-101 (2011 & 2012 Batch)

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. Answer briefly :

- (a) What will happen if the length of a conductor is doubled and its area of cross section is also doubled ?
 - (i) Resistance will increase four times.
 - (ii) Resistance remains unchanged.
 - (iii) Resistance decreases to four times.
 - (iv) Change at random.
- (b) Give concept of work, power and energy in brief.
- (c) Instantaneous current is given by the relation $I = 20 \sin 314t$, Find r.m.s. and average value of A.C. ?
- (d) What is the theory of shunt ?
- (e) State similarities of electric and magnetic circuits.
- (f) Why cannot a 3-phase induction motor runs at synchronous speed ?

- (g) Give applications of strain gauge.
- (h) Draw symbolic representation of BJT and FET.
- (i) Convert $(4287)_{10}$ into hexadecimal number system.
- (j) Draw symbols of EX-OR and NAND gate.

SECTION-B

- 2. (a) State and explain Kirchoffs laws.
(b) Illustrate Ohm's laws.
- 3. A wire of 100Ω resistance is cut into how many equal pieces, so that when they are connected in parallel resultant is 1Ω ?
- 4. (a) Derive an expression for emf equation of single phase transformer.
(b) An a.c. has frequency 50 Hz and rms current 25 Amp. Write equation of instantaneous current and find :
 - (i) Current at time 0.0025 seconds
 - (ii) time at which current is 14.14 amp.
- 5. A 3 phase induction motor is wound for 4 poles and is supplied from 3 phase, 50 Hz system. Calculate :
 - (a) the synchronous speed
 - (b) Speed of the motor when slip is 0.04 and
 - (c) the rotor when motor runs at 60 rpm.

SECTION-C

- 6. What is LVDT ? Discuss its principle and applications with neat diagram.
- 7. (a) Discuss working principle of a P-N junction diode. Also show its characteristics and mention its important applications.
(b) A germanium diode has a saturation current of 10^{-8}A . Calculate for the junction current for a forward bias of 0.4 volts and 300°K .
- 8. Describe the operation of RS flip flop with suitable wave form.
- 9. What are universal gates and why they are called so ? How can OR and XOR gates be realized using NAND gates only ?