

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (2005-2010 Batches) (Sem.-1st & 2nd)
BASIC ELECTRICAL & ELECTRONICS ENGG.

Subject Code : EE-101

Paper ID : [A0126]

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

I. Answer briefly :

- (a) Two resistances, one of 30 Ω and another of unknown value are connected in parallel, the total power dissipated is 450 watts at 90 volts. Find the unknown resistance.
- (b) Determine the average and rms values of sinusoidal current of peak value 50 A.
- (c) Give the working principle of a D.C. shunt motor.
- (d) What are various applications of transformers ?
- (e) Why is the graduation of scale of moving iron instrument not uniform through out ?
- (f) Why permanent magnet moving coil instruments can not be used for ac measurement of high frequency?
- (g) What are photoelectric transducers?
- (h) Draw a sketch showing parts of an n -channel field effect transistor.
- (i) What are Digital ICS ?
- (j) Convert decimal 150 into its equivalent octal and hexadecimal numbers.

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SECTION-B

2. (a) What is the effect of temperature on the conductors usually used in overhead lines ?
- (b) An electric iron is marked 250 V, 500 W. What current does it take if connected to 250 V ? If the iron is used for one hour daily for 30 days; what will be the monthly bill at Rs. 3.00 per unit? (4 + 4)
3. Two parallel circuits comprise respectively (i) a coil of resistance 20Ω and inductance 0.07 H (ii) a condenser of capacitance $60 \mu\text{F}$ in series with a resistance of 50Ω . Calculate the current in the mains and the power factor of the arrangement when connected across a 200 V, 50Hz supply. (8)
4. (a) Distinguish between statically induced emf and dynamically induced emf. Derive the expression for a dynamically induced e.m.f. developed in a conductor of length 1 m moving with a velocity of $v \text{ m/s}$ in a uniform magnetic field of flux density of $B \text{ Wb/m}^2$.
- (b) Draw a neat sketch showing various parts of a squirrel cage induction motor. (4 + 4)
5. Draw a neat diagram of a moving iron repulsion type ammeter and explain its working. Give its advantages and disadvantages. (8)

SECTION-C

6. (a) Explain the working of an electrical strain gauge.
- (b) What are thermistors ? Give some applications of thermistors. (5 + 3)
7. (a) Explain how a transistor functions as a switch.
- (b) Explain the working of a full wave rectifier. (4 + 4)
8. (a) Give the pin diagram and its description for IC 78 XX.
- (b) What is IC 741 used for ? Give its pin diagram. (5 + 3)
9. (a) Differentiate between level and edge triggering. Draw the logic circuit and truth table for J-K flip-flop.
- (b) Construct an S-R flip-flop and give its truth table. (5 + 3)