Roll No. | | | | | | | | | | | | | **Total No. of Pages: 02**

Total No. of Questions: 09

B.Tech (Sem. – 1,2)

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Subject Code: BTEE-101

M Code: 54097

Date of Examination : 20-01-23

Time: 3 Hrs. **Max. Marks: 60**

INSTRUCTIONS TO CANDIDATES:

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

SECTION-A

1. Write briefly:

a) Draw the phasor diagram of Electric field: $E_0\left(e^{-j10\pi t} + e^{+j10\pi t}\right)$. Also, write it inrectangular form.

b) Give the analogous terms of magnetic circuit related to an electrical circuit.

c) Draw the circuit diagram and waveforms of a bridge rectifier.

d) Write the differences between Bipolar Junction Transistor andField Effect Transistors.

e) Define synchronous speed. How does this speed relate to slip?

f) Convert the $(1234)_{10}$ number into the hexadecimal number.

g) Which motor is preferred for speed regulation?

h) Convert the decimal number 39.75 to hexadecimal.

i) Draw the characteristics curve of positive and thermistor.

j) A choke coil when connected across a $500V, 50Hz$ supply takes 1 A at 0.8 power factor. What capacitance must be placed in parallel with it so as to make the power factor of the combination unity?

SECTION-B

2. Find the amount of electrical energy expensed in raising the temperature of 45 litres of water by $73°C$. To what height could a weight of 5 tonnes be raised with the expenditure of same energy? Assume efficiencies of the heating equipment and lifting equipment to be 90% and 70% respectively.

3. a) Discuss and derive the resonance in a series circuit. Give its properties.

   b) A voltage $v = 100\sin\ 314t$ is applied to a circuit consisting of a 25Ω resistor and an 80μF capacitor in series. Determine:

      i) An expression for the value of the current flowing at any instant.

      ii) The power consumed.

      iii) The p.d. across the capacitor at the instant when current is one half of its maximum value.

4. Describe the concept of bias stabilization in transistors and amplifiers.

5. Establish the relation for emf induced in the secondary winding of transformer. What are types of losses occur in transformers? Establish the condition of maximum efficiency of transformer.

SECTION-C

6. Discuss the types of D.C. motors. Compare their Torque, speed characteristics and applications.

7. Distinguish between latch and flip flop. Explain the working of cross coupled NAND gate as flip flop. Draw the truth table of RS, JK, D and T flip flops. Convert the RS flip flop into JK flip flop. How edge triggered flip flop different from level triggered?Give its advantage.

8. **Write detailed short note on the following:**

   a) Universal Gates

   b) Field Effect transistors

9. a) Explain the principle of working of a digital multimeter.

   b) What is LVDT? Give its principle of working, applications, advantages and disadvantages.

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.