21718

3 Hours / 100 Marks   Seat No.

Instructions : (1) *All questions are **compulsory**.*
(2) *Answer **each** Section on **separate** answer sheet.*
(3) *Illustrate your answers with neat sketches **wherever** necessary.*
(4) *Figures to the **right** indicate **full** marks.*
(5) *Assume suitable data, if **necessary**.*
(6) *Use of Non-programmable Electronic Pocket Calculator is **permissible**.*
(7) *Mobile Phone, Pager and any other Electronic Communication devices are **not** permissible in Examination Hall.*

Marks

SECTION – I

1. Attempt **any five** of the following :   **20**

   a) Define the following terms related with an AC quantity :
      i) RMS value   ii) Cycle
      iii) Phase   iv) Frequency

   b) A balanced star connected load is supplied from 400 volt, 3-phase, 50 Hz supply. The resistance per phase is 25 ohm. Calculate
      i) line voltage   ii) phase voltage
      iii) line current   iv) power consumed

   c) Explain construction and working principle of transformer with diagram.

   d) Explain with diagram the working of universal motor and state its two application.

   e) What are the different types of lamps used for domestic application ? Explain any one.

   f) State applications of any four safety tools used in electrical workshop.

   g) List any four safety precautions to be taken while handling an electrical equipments.

2. Attempt **any three** of the following :   **18**

   a) Explain construction and working of auto-transformer with diagram. List its four application.

   b) Draw and explain speed-torque characteristics of 3-phase I.M. List its two application.

   c) Explain any six factors to be considered while selection of motors for different drives.

   d) Draw delta connected 3-phase supply system, mark line, phase voltage, line current and phase current. Write power equation.

P.T.O.

Marks

3. Attempt **any three** of the following :   **12**

  a) Define power and energy with their units.

  b) Define transformation ratio and turn ratio of the transformer.

  c) Draw circuit diagram of direct on-line starter. List its two applications.

  d) Compare between MCCB and ELCB (any four point).

  e) Why earthing is required ? Write necessity of earthing.

SECTION – II

4. Attempt **any five** of the following :   **20**

  a) With the help of a neat diagram explain construction and working of LED.

  b) Explain zener diode as a voltage regulator.

  c) Draw circuit diagram of phase shift oscillator. List its two application.

  d) Draw symbol and truth table of

    i) OR gate   ii) NOR gate

    iii) NAND gate   iv) AND gate

  e) Compare between intrinsic and extrinsic semiconductor (any four point).

  f) Explain half wave rectifier with circuit diagram and wave form diagram.

5. Attempt **any three** of the following :   **18**

  a) Write the comparison between CE, CB and CC configuration (any six points).

  b) Convert following binary number to decimal, Hexadecimal and octal form $(10011.1101)_2$.

  c) Draw and explain block diagram of regulated power supply in detail.

  d) i) Compare between conductor and insulator (any three point).

    ii) Explain working of PN junction diode.

6. Attempt **any three** of the following :   **12**

  a) Explain the working of full wave bridge type rectifier with help of circuit diagram.

  b) Explain block diagram of OP-AMP.

  c) Explain with diagram OP-AMP as a non inverting amplifier.

  d) Convert the following :

    i) $(64)_{10} \rightarrow ()_2$ ii) $(3000.45)_{10} \rightarrow ()_8$

  e) Explain crystal oscillator with diagram.

  f) State Barkhausen's criteria for oscillation.

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