21819

3 Hours / 70 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 SIX of the following :**   **12**

(a)   State Faraday's law of electromagnetic induction.

(b)   Define permeability and reluctance.

(c)   Define phase angle and power factor.

(d)   Define MMF and leakage factor.

(e)   State concept of power triangle.

(f)   Define power & energy.

(g)   Define RMS value & Average value.

2. **Attempt any THREE of the following :** 12

   (a) Define Autotransformer. Explain working of autotransformer.

   (b) Define (i) Self induced emf (ii) mutually induced emf and give their equations.

   (c) Draw and explain series R-L-C circuit.

   (d) State different methods for starting of induction motor. Explain any one method.

   (e) Compare autotransformer and 1-ϕ two-winding transformer.

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

   (a) Explain construction and working principle of single phase ac motor. Give emf equation of single phase ac motor.

   (b) State various types of FHP motors. Explain the construction of any one FHP motor.

   (c) Given a sinusoidal voltage equation, $v = 169.8 \sin 377 t$

   Find

   (i) Maximum voltage

   (ii) Frequency

   (iii) Time period

   (iv) RMS voltage

   (v) Average voltage

   (vi) Angular velocity

Section – II

4. **Attempt any FIVE of the following :** 10

   (a) Compare analog and digital IC. (any 2 points)

   (b) Draw the symbol of (i) Zener diode (ii) LED.

   (c) State the need of filters.

   (d) Define (i) PIV (ii) Ripple factor.

   (e) List different types of Signals.

   (f) Give applications of capacitors.

5.   **Attempt any THREE of the following :**   **12**

    (a)   Draw and explain ideal current source.

    (b)   Explain working of half-wave rectifier and draw its waveforms.

    (c)   Explain cut-off region, saturation region and active region in characteristics of transistors.

    (d)   Explain CE configuration of transistors with input and output characteristics.

    (e)   Explain Zener diode as a voltage regulator.

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

    (a)   List types of bipolar devices. Explain transistor as a switch and amplifier.

    (b)   List types of filters. Explain 'C' type of filter.

    (c)   Find the resistor value from the given colour code or vice versa.

        (i)   Red, Red, Red, Gold

        (ii)   Brown, Black, Brown, Silver

        (iii) $1M\Omega \pm 5\%$

_____