22239

23124

3 Hours / 70 Marks   Seat No.

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each Section on separate answer Book.

(3) Answer each next main Question on a new page.

(4) Illustrate your answers with neat sketches wherever necessary.

(5) Figures to the right indicate full marks.

(6) Assume suitable data, if necessary.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

(8) Preferably, write the answers in sequential order.

SECTION - I

Marks

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

a) State KCL and KVL.

b) Define the term Energy.

c) State the working principle of transformer.

d) State the names of electrical machines used for Textiles industry. (any two)

e) State the digital meters used for measurement of AC/DC electrical quantities.

f) State the types of lamps used in Textile industry. (any two)

g) State solar energy applications in Textile industry.

Marks

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

  a) State the meaning of power factor and explain their improvement method by capacitor.

  b) A 25-KVA transformer has 500 turns on the primary and 50 turns on the secondary winding. The primary is connected to 3000 V, 50 Hz supply. Find the full load primary and secondary currents, the secondary emf and the maximum flux in the core.

  c) A pure resistance of 50 ohms is in series with a pure capacitance of 100 microfarads. The series combination is connected across 100 v, 50 Hz supply. Find
    i) the impedance
    ii) current
    iii) power factor
    iv) voltage across resistor.

  d) State the working principle of 3-phase IM and explain construction of same.

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

  a) State the following laws:

    i) Lenz's law

    ii) Fleming's Right Hand rule.

  b) Explain the construction of 1-Phase transformer.

  c) A 3-phase induction motor is wound for 4 poles and is supplied from 50 Hz system. Calculate
    i) the synchronous speed.
    ii) the rotor speed when slip is 4% and
    iii rotor frequency
  when rotor runs at 600 rpm.

  d) Draw a line diagram of 3-phase wiring circuit for any textile industries / workshop.

  e) Comapre CFL and LED. (any four points)

Marks

SECTION - II

4.   **Attempt any SIX of the following:**   **12**

   a)   Define the term active and passive components with suitable example.

   b)   Give the classification of capacitor.

   c)   Give the classification of materials.

   d)   Define the term intrinsic and extrinsic semi conductor.

   e)   Draw the symbol of P-N junction diode and PNP transistor.

   f)   Give the full form of LVDT and RTD.

   g)   State the types of sensors. (any four)

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

   a)   Draw and explain V-I characteristics of P-N junction diode.

   b)   Identify value of resistor using color code:

      i)   Yellow, Violet, Orange, Gold

      ii)   Red, Red, Green, Silver

   c)   State the various types of optical sensors and explain any one of them.

   d)   Explain thermistor and thermocouple.

   e)   State various types of actuators and explain any one of them.

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

   a)   Compare half wave and full wave rectifiers with suitable diagram and waveforms.

   b)   Explain the use of Bourdon tube for pressure measurement in textile industry with neat sketch.

   c)   State and explain the force and weight measurement sensors.

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