

22239

21718

3 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
(2) Answer each next main Question on a new page.
(3) Illustrate your answers with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) 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: 10
- Define power. State its unit.
 - State Kirchhoff's Law.
 - State application of Induction motor.
 - State the types of single phase transformer.
 - Compare between CFL and LED.
 - State the working principle of Solar Electricity.
 - Define current. State its unit.

P.T.O.

2. Attempt any THREE of the following: 12

- a) A capacitance of $20\ \mu\text{F}$ and a resistance of $100\ \Omega$ are connected in series across a 230V , 50Hz supply mains. Determine the power factor and current taken by the circuit.
- b) An ideal single phase transformer has 300 turns primary winding with 480V , 60Hz supply. The desired secondary voltage is 120V . If a $100\ \Omega$ resistor is connected across the secondary, determine
 - i) Secondary turns
 - ii) Current through the resistor
 - iii) Primary current
 - iv) Maximum flux in the core of transformer
- c) State the general precautions to be followed while using Analog and digital meters for measuring Ac/dc quantities.
- d) Describe the working principle of servomotor.
- e) Draw three phase wiring diagram for any textile industry/workshop.

3. Attempt any THREE of the following: 12

- a) Describe the construction and working principle of single phase transformer.
- b) A 3ϕ 4 pole induction motor is supplied from 3ϕ , 50Hz supply. Find
 - i) Rotor speed when slip is 4%
 - ii) Rotor frequency when motor runs at 600 r.p.m.
- c) Define power factor. Describe the method to improve power factor using capacitor.
- d) Describe the methods of energy saving in textile industry.

SECTION-II

- 4. Attempt any SIX of the following: 12**
- a) Define intrinsic and extrinsic semi conductor.
 - b) Name any two active and passive components each.
 - c) State two impurities for obtaining P and n-type semi conductor from intrinsic semiconductor.
 - d) State any two applications of diode and transistor.
 - e) State the types of optical sensors.
 - f) State the operating principle of bourdon tube.
 - g) State the operating principle of opto coupler.
- 5. Attempt any THREE of the following: 12**
- a) Compare RTD, Thermocouple and thermistor.
 - b) Describe the construction and working principle of LVDT.
 - c) Identify the sensors used in the following machines.
 - i) Yarn evenness
 - ii) automatic weft straightening
 - d) Describe the construction and working principle of NPN transistor.
 - e) Describe the working principle of transistor as switch.
- 6. Attempt any TWO of the following: 12**
- a) Describe working principle of full wave rectifier with circuit diagram and waveform.
 - b) Describe the working principle of thermocouple. State its types and temperature range of measurement.
 - c) i) Write the colour code (4 band) for the following resistors.
 - 1) $10\text{K}\Omega$ 5% tolerance
 - 2) $22\text{K}\Omega$ 10% tolerance.ii) Describe the operating principle of relay.
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