17641

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

1. **Attempt any <u>FIVE</u> of the following:** 20

   a) Explain construction and working of thermal-overload relay.

   b) State why 3-wire control is advantageous over two-wire control.

   c) State operating principle of dc servo motor.

   d) What is proximity sensor? Explain capacitive type proximity sensor.

   e) Explain any two PLC input instructions.

   f) Draw ladder diagram for OR and AND gate.

   g) Explain integral control action for elimination of offset error.

2. **Attempt any <u>TWO</u> of the following:** 16

   a) Draw and explain power and control circuit of automatic star-delta starter with timer for three phase induction motor.

   b) Draw and explain power and control circuit for definite time limit starter for slip-ring induction motor.

   c) Draw and explain block diagram of PID controller.

Marks

3. Attempt any FOUR of the following: 16

   a) List the types of PLC memory. State the function of each type.

   b) List the specifications of digital I/o modules.

   c) Draw and explain one contact, one coil circuit.

   d) Explain concept of isolation of field devices from CPU in PLC.

   e) Explain working of reed switch. State its advantages.

   f) Draw and explain interlocking of contactors using push button switches.

4. Attempt any TWO of the following: 16

   a) Draw and explain power and control circuit of semiautomatic type starter for three phase induction motor.

   b) Draw and explain power and control circuit of dc injection braking for induction motor.

   c) Explain working of analog input module in PLC.

5. Attempt any TWO of the following: 16

   a) Draw block diagram and explain working of digital input module in PLC.

   b) List types of counters available in PLC. Explain any one with example.

   c) Explain working of ON-delay timer in PLC.

6. Attempt any FOUR of the following: 16

   a) Define auxilliary contact. Describe its role in electrical circuits.

   b) Draw block diagram of PLC. State function of each block.

   c) Draw ladder diagram for star-delta starter.

   d) Explain working of proportional controller.

   e) Draw and explain functional diagram of PID in PLC.

   f) Draw block diagram and explain PID module in PLC.

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