



17641

11819

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) *All questions are compulsory.*
 - (2) *Illustrate your answers with neat sketches wherever necessary.*
 - (3) *Figures to the right indicate full marks.*
 - (4) *Assume suitable data, if necessary.*
 - (5) *Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.*

Marks

1. Attempt any five : 20
 - a) Explain the concept of Capacitive type proximity switch with neat Schematic diagram.
 - b) Draw ladder diagram for following sequences :
 - i) When NO START PUSH button is pressed Green light is on
 - ii) And when NC STOP P.B. is pressed Red light is on, Green light goes off
 - c) List any four applications of servomotor.
 - d) Draw block diagram of proportional controller.
 - e) List any two ratings of digital input and digital output module each.
 - f) Explain why derivative action is not used alone.
 - g) State any two input and two output devices of PLC.

2. Attempt any two : 16
 - a)
 - i) List any four names of optical sensors.
 - ii) Explain role of opto isolator in PLC with neat diagram.
 - b) Draw power and control circuit diagram for definite time limit starter for slip ring induction motors. Explain its working.
 - c) Explain ON-Delay timer of PLC with suitable example.

3. Attempt any four : 16
 - a) Draw construction of DC servomotor.
 - b) Draw and explain PD controller.

P.T.O.



- c) Explain construction and working of solenoid valve.
- d) List types of memory. Explain any one type of memory in brief.
- e) Differentiate between power and control wiring (any four points).
- f) Draw ladder diagram to verify :
- i) AND Gate
 - ii) EX OR Gate.
- 4. Attempt any four :** **16**
- a) List any two advantages and any two disadvantages of PLC.
- b) Explain pressure actuated switch with neat constructional diagram.
- c) Develop ladder diagram for start-delta (automatic) starter.
- d) Differentiate between two wire and three wire control (any four points).
- e) Explain Integral control action in brief.
- f) Draw block diagram of digital output Module of PLC.
- 5. Attempt any two :** **16**
- a) Explain UP counter instruction of PLC with suitable example.
- b) Draw a power and control circuit diagram of automatic type star delta starter using timer for 3 ϕ induction motor.
- c) Draw block diagram of PLC. Explain function of each block in brief.
- 6. Attempt any four :** **16**
- a) Develop ladder diagram for following sequences :
- i) When NO START PB is pressed Motor M₁ Starts and after 10 seconds Motor M₂ starts.
 - ii) When NC STOP PB is pressed both Motor M₁, M₂ stops immediately.
- b) Draw construction of Bimetallic thermal over loaded relay. Explain its working.
- c) Draw block diagram of PID controller.
- d) Develop power and control diagram for secondary frequency acceleration starter of slip ring induction motor.
- e) Explain the terms :
- i) Proportional band
 - ii) Offset.
- f) Explain inductive type proximity sensor with neat diagram.
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