17641

15162

3 Hours / 100 Marks Seat No. | | | | | | | | |

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. (A) Attempt any THREE : **12**

(i) Define the following :

(a) Push button

(b) Selector switch

(c) Proximity switch

(d) Limit switch

(ii) Draw diagram of DOL starter power and control circuit for 3-phase induction motor for forward stop-reverse operation. Explain its working.

(iii) State advantages of PLC. (Any four)

(iv) Explain proportional controller process control action.

(B) Attempt any ONE : **6**

(i) Draw block diagram of PLC. State functions of its component.

(ii) Draw ladder diagram for 3 phase induction motor start/stop operation. Explain its working. Enlist PLC Input/Outputs in them.

P.T.O.

2. Attempt any FOUR : **16**

(a) Draw Star/Delta starter circuit diagram for 3-phase induction motor using timer. Explain its working.

(b) Describe operation of solenoid valve with neat diagram.

(c) Draw the block diagram of digital input module of PLC. State function of its blocks.

(d) Compare between P-controller and PI-controller control action (four points).

(e) Explain on delay timer operation with diagram.

(f) Develop ladder diagram for (i) AND gate (ii) OR gate.

3. Attempt any FOUR : **16**

(a) Draw Star/Delta starter circuit diagram for 3-phase Induction Motor semi automatic type. Explain its working.

(b) Describe operation of pneumatic cylinder with neat diagram.

(c) Draw block diagram of analog input module of PLC. State function of its blocks.

(d) Define derivative controller. State their advantages.

(e) Explain off delay timer operation with neat diagram.

(f) Describe working of PID controller.

4. (A) Attempt any THREE : **12**

(i) Draw neat control and power circuit diagram of simple plugging of motor. Explain its working.

(ii) Compare between inductive and capacitive type proximity switch.

(iii) State function of following :

(a) EPROM

(b) EEPROM

(iv) Develop ladder diagram for logic operations :

(a) NOT

(b) EX OR

(B) Attempt any ONE : **6**

(i) Describe working of A.C. servomotor with neat diagram. State their application.

(ii) Draw ladder diagram for two motor system with following conditions :

(a) Starting push button starts motor-1

(b) After 10 sec. motor – 2 is ON.

(c) Stopping switch stops motor 1 & 2.

5. Attempt any FOUR : **16**

(a) Draw power & control circuit diagram of starter for slipring induction motor with current limit acceleration starter. Explain its working.

(b) Explain the following :

(i) pressure switch

(ii) temperature switch

with diagrams.

(c) Differentiate between RAM & ROM in PLC memory.

(d) Describe working of up/down counter.

(e) Define Integral controller. State their advantages.

6. Attempt any FOUR : **16**

(a) Draw power and control circuit diagram for D.C. injection braking of induction motor. Explain its working.

(b) Compare between AC & DC servomotor.

(c) Draw block diagram of PLC power supply. Explain its working.

(d) List any four typical input and outputs of PLC.

(e) Compare between PI-controller & PID controller control action.