12526

3 Hours / 70 Marks Seat No. | | | | | | | | |

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

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

(3) Illustrate your answer 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 FIVE of the following: **10**

a) State the need of Automation.

b) Draw the symbol of following components :–

i) Push button

ii) Pressure switch

iii) Limit switch

iv) Overload relay.

c) Draw the block diagram of PLC.

d) State the function of seal-in circuit w.r. to PLC.

e) State any two uses of HMI.

f) Draw and explain ladder diagram for AND operation.

g) List types of timers.

Marks

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

a) Develop the control circuit for star-delta starter used for starting 3-ϕ induction motor.

b) Explain with block diagram digital output module of PLC.

c) Explain the following relay type instructions :–

i) IF – OPEN

ii) IF – CLOSE with its symbol

d) Write the ladder program for 24 hour clock.

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

a) Explain count up (CTU) instruction with timing diagram.

b) Draw block diagram of SCADA and list different components of it.

c) Develop the ladder diagram for stepper motor control.

d) Classify timers of PLC and explain TON timer in detail.

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

a) State the function of latching of relay using PLC.

b) Explain the working of PLC based traffic light control.

c) Explain the block diagram and working of soft-starter.

d) Explain the working of STAR-DELTA. Starter with power circuit diagram.

e) Classify counter of PLC and explain any one counter function in detail.

Marks

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

a) Develop control and power circuit for lifting magnet used as a material handling equipment.

b) Explain the block diagram and function of each part in P/D controller module.

c) Develop control and power circuit for conveyor.

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

a) Develop a ladder diagram for ON/OFF temperature control.

b) List the different components of ladder diagram and explain the program scanning process in detail.

c) Explain the working of PLC based bottle filling system with the help of ladder diagram.