22640

12425

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

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) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) 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 significance of OPC in SCADA bused application.

b) Describe the role of programming device in PLC.

c) State the sourcing concept in DC output module.

d) List the relay type instructions used in PLC with functional diagram (Any four)

e) Give the function of TT bit and DN bit used in Timer instruction of PLC.

f) State any four functions performed by SCADA.

g) Define :

i) Tags

ii) Item with respect to SCADA.

Marks

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

a) Differentiate between fixed PLC and modular PLC with following points:

i) Expansion capacity

ii) Memory capacity

iii) Types and

iv) Size

b) State the I/O module selection criteria.

c) Draw the functional block diagram of Down counter. Also draw its word format. Explain the function of CD and UN bits.

d) Describe the steps involve in interfacing the PLC based application with SCADA system.

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

a) Describe the discrete DC output module with neat block diagram.

b) Give one example for :

i) Logical addressing for the input status table.

ii) Logical addressing for the output status table.

iii) Logical addressing for bit within an integer file.

iv) Logical addressing for bit within binary file.

c) A 4-bit thumbwheel switch (rotary encoder) is connected to the 4 inputs of PLC. When timer is off, load thumbwheel data as a preset value of timer. When timer times out, start motor 1.

d) Describe steps for linking SCADA object with PLC ladder program using OPC with suitable example.

Marks

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

a) Draw block diagram of power supply used in PLC. Describe function of each block.

b) Draw the block diagram of AC input module and explain function of each block.

c) List with functional diagram of logical instructions used in PLC with one example each.

d) Draw the block diagram of SCADA and describe function of each block in detail.

e) Describe the steps in creating SCADA screen for simple object.

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

a) Draw and explain the block diagram of analog input module. State any two input devices which can be interfaced with analog input module.

b) Write a ladder program to run a conveyor so that if push buttons are operated in the following order: PB1 the PB2 then PB3 the conveyor should start. If push buttons are operated in any other order, then an alarm should operate consider push buttons as ordinary switches.

c) Design ON-OFF control of lamp using SCADA system.

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

a) Write a ladder logic program for two way traffic light control using sequence instruction. Assume suitable time duration for lamps to glow.

b) Describe with example different PLC programming languages.

c) Describe single master multiple remote and multiple master multiple remote SCADA system with neat block diagram.