314335

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 answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) 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) List the benefits of using PLCs in industrial automation.

b) Name any two types of PLC Counter Instruction.

c) Compare fixed and modular PLC. (any two points)

d) List 4 different programming languages used to program PLC.

e) List any four applications of SCADA.

f) Draw a neat diagram of OPC architecture.

g) Write a Ladder program for Seal in circuit or Latch circuit.

Marks

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

a) Draw a block diagram of RTU and explain its use in the SCADA system.

b) List arithmetic instructions along with their symbols used in ladder programming.

c) Describe sinking and sourcing in PLC with neat diagram.

d) Describe the method for developing HMI screen for blinking applications.

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

a) Draw a neat architecture for HMI and describe its function.

b) Describe the method for integrating HMI panel with PLC.

c) Describe the working of the UP counter with a neat diagram and waveform.

d) Explain typical MODBUS architecture with a neat diagram.

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

a) Draw a ladder diagram for -

i) 3 input OR gate,

ii) 2 input EX-OR gate.

b) Draw architecture of PLC and explain function of –

i) CPU

ii) I/O modules.

c) Describe the PLC installation procedure.

d) Develop a maintenance schedule for a PLC-based conveyor system.

e) Compare PLC and Microcontroller. (any four points)

Marks

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

a) Difference between RS 232, RS 422 and RS 485 on the basis of –

i) Number of devices

ii) Maximum data rate

iii) Receiver sensitivity

b) Draw a ladder diagram that will control stepper motor so that it moves 10 steps forward, waits for 20 seconds and then causes the motor to move 10 steps in reverse direction.

c) Describe the steps involved in developing SCADA Screen for bottle filling system application.

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

a) Explain the format of EQU, LES, GRT, LEQ, NEQ and GEQ comparison instructions.

b) Compare PLC and SCADA systems on any six points.

c) Write a ladder program of smart car parking system. Assume suitable conditions.

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