17664

11920

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

Instructions : (1) All Questions are *compulsory.*

(2) Answer each Section on same / separate answer sheet.

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

(4) Illustrate your answers with neat sketches wherever necessary.

(5) Figures to the right indicate full marks.

(6) Assume suitable data, if necessary.

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

(8) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

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

(a) List any four benefits of automation.

(b) Draw block diagram of PLC. List any two programming devices used for PLC.

(c) Define following terms related to PLC :

(i) Operating cycle of PLC

(ii) Speed of execution

(d) List any four precautions taken while placing PLC in an enclosure.

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

(a) (i) Give classification of PLC.

(ii) Compare fixed and modular PLC (any four points)

(b) Draw block diagram of analog input module. Describe function of each block.

2. Attempt any TWO : **16**

(a) Describe the following speciality input modules :

(i) Stepper motor control module

(ii) Thermocouple module

(b) Draw ladder diagram for blinking of LED with delay of 10 seconds.

(c) (i) Draw block diagram of AC output module.

(ii) Draw wiring diagram to connect AC load to PLC. Specify which type of O/P module can be used.

3. Attempt any FOUR : **16**

(a) List any four specifications of AC input module.

(b) List any four automation tools. Describe DCS.

(c) Give truth table and draw ladder diagram for NAND and EX-OR Gate.

(d) Give classification of PLC programming languages.

(e) Describe how noise suppression is done during PLC installation.

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

(a) Describe why grounding is necessary for PLC during installation.

(b) Draw instruction format of Up-counter. Describe function of each bit.

(c) Give details of trouble shooting in PLC system.

(d) Describe the term redundancy in PLC with diagram.

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

(a) Draw and describe PLC as sinking and sourcing input device.

(b) Draw logic diagram and ladder diagram for 4 : 1 multiplexer.

5. Attempt any TWO : **16**

(a) Draw block diagram of DC input module. Describe function of each block.

(b) (i) Describe the function and organization of RAM and ROM in PLC.

(ii) List any four data handling instructions used in PLC. Describe any one instruction in details.

(c) Draw ladder diagram for traffic control system. (Assume suitable data)

6. Attempt any FOUR : **16**

(a) Draw ladder diagram for given Boolean equation :

(i) $Y = \overline{A}\,BC + \overline{A}\,\overline{B}\,\overline{C} + A\,B\,C$

(ii) $Y = A\,\overline{B}\,C\,(C + D)$

(b) Draw ladder diagram for following conditions :

if Y > N7 : 3 switch ON motor 1.

if Y ≤ N7 : 3 switch ON motor 2.

(c) Write general format for PID instruction.

(d) Describe I/O addressing in PLC.

(e) Draw format of ON Delay timer with waveforms.

———————