17664

11718

3 Hours / 100 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. (A) Attempt any THREE : **12**

(a) State the need of Automation.

(b) Draw the block diagram of Analog input module.

(c) Draw the symbols of following instruction in ladder logic :

(i) NO

(ii) OSR

(iii) Output coil

(iv) NC

(d) Illustrate the concept of sinking type of DC output module.

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

(a) State the two advantages of PLC over relay logic. (any six)

(b) Draw the block diagram of AC input module. State the function of each.

2. Attempt any TWO : **16**

(a) Draw and explain the format of sequencer instruction and scale with parameter instruction of PLC.

(b) Draw the ladder diagram for following conditions :

(i) When start switch pressed, motor 1 starts after 10 sec motor 2 starts

(ii) When stop switch pressed, motor 1 stops, 15 sec later motor 2 stops.

(c) Draw the ladder diagram to verify the truth table of following logic gates.

(i) AND

(ii) NOT

(iii) EXOR

(iv) OR

3. Attempt any FOUR: **16**

(a) Give the functions of following components of PLC :

(i) I/P modules

(ii) CPU

(b) Enlist benefits of Automation. (any four)

(c) Draw the diagram sourcing input module and explain.

(d) If input addressing of PLC is I 1 : 2.0/3. What does 1, 1, 2, 0, 3 indicates ?

(e) State four precautions when placing PLC in an enclosure.

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

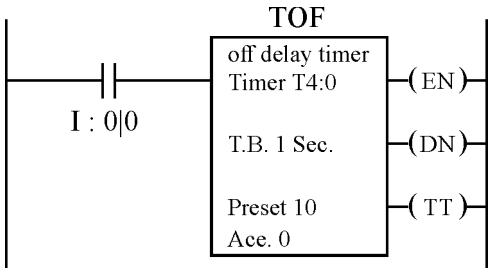
(a) Draw the timing diagram for following timer instruction bit :

(i) I : 0|0

(ii) EN

(iii) DN

(iv) TT



(b) State the concept of redundancy w.r.t. PLC.

(c) Draw ladder diagram for given truth tables :

A	B	y
0	0	1
0	1	0
1	0	0
1	1	0

A	B	y
0	0	1
0	1	0
1	0	0
1	1	1

(d) Explain the master control relay used in PLC.

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

(a) Classify the following devices into input and output devices w.r.t. PLC, pressure switch, Thermocouple, Motor, push button, Relay coil, toggle switch, Stepper motor, level switch, Alarm, RTD, Lamp, Sensor.

(b) Draw and explain analog output module.

P.T.O.

5. Attempt any TWO : **16**

(a) Draw block diagram of AC output module of PLC. Explain its working. State its any four specifications.

(b) Draw the ladder diagram for traffic light control :

(i) When start push button (PB1) is pressed system start and when stop push button is pressed system stops (PB2)

(ii) The Red light is ON for 15 sec and then turns (RL) OFF.

(iii) After red light is turn OFF, the yellow light turns ON and turns OFF after 05 sec.

(iv) After yellow light is turn OFF, green light turns ON for 20 sec and then turn OFF.

(v) The sequence repeats from step 2 again.

(c) Draw the ladder diagram for three motor sequence control. Three DC motors need to be controlled sequentially one after another.

(i) When start button pressed, M_1 will be started.

(ii) When M_1 started, after 10 sec M_2 will start.

(iii) When M_2 started, after 15 sec M_3 will start.

(iv) All the motors should stopped immediately when stop button is pressed.

6. Attempt any FOUR : **16**

(a) State the name of speciality I/O modules of PLC. Explain any one.

(b) List the different counter instructions of PLC and explain any one in detail.

(c) List the important guidelines for maintenance of PLC.

(d) Explain the retentive timer instruction of PLC with the help of waveform.

(e) Illustrate fault detection technique for LED status of input and output module.
