11819

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) Enlist any four automation tools used in process. State need of SCADA.

(b) Draw a PLC wiring diagram for :

(1) Two push button switches.

(2) Draw 230 V AC operated motors.

(c) Draw the I/o addressing format of PLC.

(d) Describe with diagram sourcing input module.

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

(a) (i) Differentiate relay control and PLC control on the basis of complexity of hardware and speed. (2 pt.)

(ii) Explain the word redundancy with diagram. List the types of redundancies.

(b) Draw and explain block diagram of DC input module.

2. Attempt any TWO : **16**

(a) (i) Name any four PLC languages.

(ii) List the sequences instructions of PLC & explain it with suitable example.

(b) There are four outputs – R, S, T & U. Draw the ladder diagram for following conditions :-

(i) R goes off when stop s/w is pressed.

(ii) S goes off 7 seconds after R.

(iii) T goes off 6 seconds after R.

(iv) U goes off 2.5 seconds after S.

(c) A thumb wheel switch (rotary encoder) is connected to the four input's of PLC. When timer is off, load thumbwheel data as a preset value of timer. When the timer times out, start motor 1.

3. Attempt any FOUR : **16**

(a) List the types of PLCs state the number of input/outputs in each type.

(b) Define automation. State need of automation.

(c) Explain one shot & latch type instruction.

(d) Draw & explain block diagram of analog input module.

(e) Enlist any four parameters to be considered while PLC installation. Describe Grounding.

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

(a) Explain with waveforms down counter.

(b) Explain the following speciality I/o modules :

(i) Communication Module

(ii) RTD i/p Module

(c) Explain LIM and NEG instruction of PLC.

(d) How MCR (Master control relay) provides safety to PLC ?

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

(a) Draw block diagram of PLC and explain the function of power supply.

(b) Draw and explain wiring diagram of sinking and sourcing output module.

5. Attempt any TWO : **16**

(a) (i) Draw block diagram of DC output module.

(ii) List the selection criteria of I/o modules.

(b) (i) Explain functional block diagram (FBD) in detail.

(ii) Draw a ladder diagram for three floor system having following

Condition's when the up motor is ON, down motor should be off and vice versa, having three push buttons C_1, C_2, C_3 and three limit switches LS_1, LS_2, LS_3.

(c) Explain briefly speed control of DC Motor using programmable drives.

6. Attempt any FOUR : **16**

(a) Draw diagram of stepper motor control module.

(b) Draw and explain format of off timer with waveforms.

(c) State PLC maintenance guidelines.

(d) Explain any four logical instruction in detail.

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