11920

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

Marks

1.   **Attempt any <u>FIVE</u> of the following:**   **20**

a) Draw a selector switch and state its functions.

b) Mention mathematical expression of PI mode. Draw characteristic of this mode.

c) Explain digital input module of PLC.

d) List and draw standard electrical signals used for analog outputs.

e) Explain functions of ROM and RAM in PLC.

f) Explain a composite controller. Draw characteristic of PD controller.

g) Draw the block diagram of PLC power supplies. State funcitons of each block.

Marks

2. **Attempt any <u>FOUR</u> of the following:** **16**

a) Compare I and D controller actions.

b) What is solenoid? Explain its working with the help of diagram.

c) Define memory and explain different types of memory.

d) Draw ladder diagram for AND and EXOR logic operations.

e) Explain Analog output module of PLC.

f) Explain the working of Electronic overload relay with neat sketch.

3. **Attempt any <u>TWO</u> of the following:** **16**

a) Explain proportional controller with offset and proportional band. State applications of ON-OFF and P controller.

b) Draw block diagram of PLC and explain the functions of each block in detail.

c) Explain UP counter and DOWN counter instructions with waveforms.

4. **Attempt any <u>FOUR</u> of the following:** **16**

a) Draw the block diagram of SCADA for rail monitoring and control. Explain its working.

b) Develop ladder logic diagram using instructions for DOL starter.

c) State consideration and benefits of SCADA system.

d) Compare RS232 with RS485.

e) State the advantages and disadvantages of parallel communication.

f) List four input field devices used with PLC.

Marks

5. **Attempt any TWO of the following:** 16

   a) Explain PLC source and sink concept. List advantages of PLC.

   b) Develop ladder logic diagram to rotate the stepper motor continuously in clockwise directions.

   c) Define the meaning of network topology. List and explain network topologies.

6. **Attempt any FOUR of the following:** 16

   a) Draw SCADA architecture.

   b) Explain typical PLC inputs.

   c) Compare client / server network with pear to pear network.

   d) Differentiate network standards and protocols.

   e) Develop ladder logic diagram using instruction for one lamp controlled by two switches.

   f) Compare LAN, MAN, WAN.

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