17694

15162

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

Instructions – (1) All Questions are *Compulsory*.

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

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

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

Marks

1. Attempt any FIVE of the following: **20**

a) What is selector switch? State its functions (any four).

b) Explain the working of ON-OFF controller with diagram.

c) What is a PLC? State its any four applications.

d) Develop a ladder diagram to verify the truth table of following logic gates:

(i) NOT gate

(ii) AND gate

e) What is SCADA? State its any four applications.

f) What is the difference between PROM and EPROM?

g) How will you differentiate standards and protocols.

Marks

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

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

b) Explain in brief the PI controller. Draw the response of PI controller for stop input.

c) List any four advantages of PLC.

d) Draw the ladder diagram for following logic:

(i) When switch 1 is closed motor M1 starts.

(ii) After 10 sec motor M1 stop.

e) List any four disadvantages of distribution automation.

f) Compare RS 232 with RS 485.

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

a) Draw the block diagram of PLC. Explain the function of each block in detail.

b) Explain in detail the ON delay timer and OFF delay timer of PLC.

c) What is meant by network topology? List and explain various network topologies.

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

a) Draw and explain standard start-stop seal circuit.

b) Explain briefly the types of SCADA software.

c) Explain in brief the concept of broadcast network.

d) Explain the function of ROM and RAM in PLC.

e) Explain the integral controller. What is the limitation of integral mode of controller.

f) Draw the schematic of NO and NC contact. Explain its working.

Marks

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

a) (i) With a neat diagram explain the working of VFD.

(ii) Compare PI and PD controller (four points).

b) Draw and explain the digital I/O module. State their ratings.

c) Draw a ladder diagram for following logic (see Fig. No. 1):

(i) When start button is pressed the process starts.

(ii) If the level is low, the valve V1 is open and valve V2 is closed.

(iii) If the level is high, the valve V1 is closed and valve V2 is open.

(iv) The process stops when the stop push button is pressed.

List the I/O for the above process.

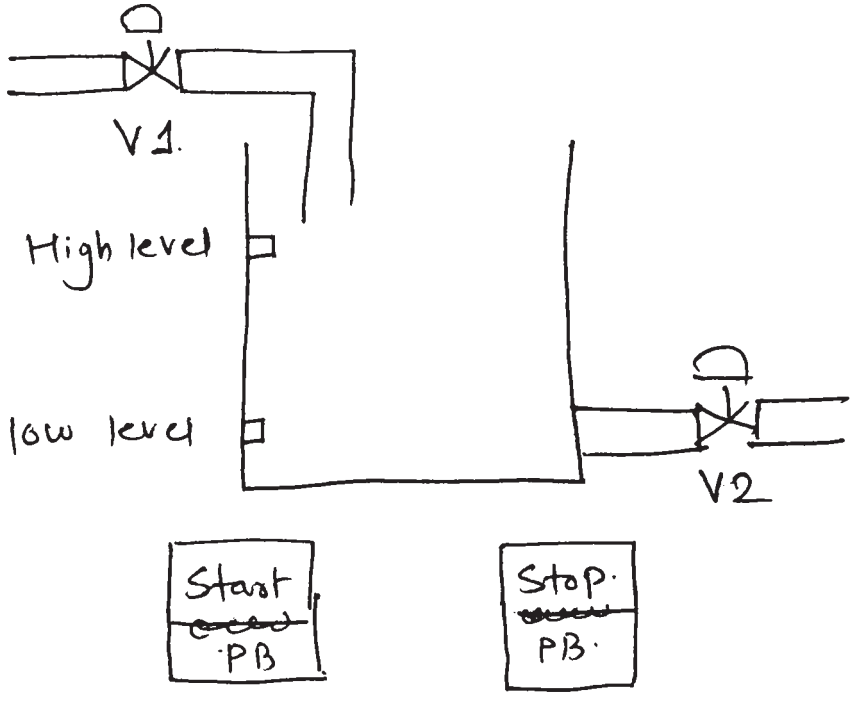

Fig. No. 1

Marks

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

a) Draw the PID controller and explain it.

b) Explain the selection criteria for PLC module.

c) Draw a ladder diagram to control the direction of stepper motor.

d) List the typical inputs and outputs of PLC (Four each).

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

f) What is the difference between synchronous and asynchronous communication. Give an example of each.

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