22475

12425

03 Hours / 70 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 FIVE of the following: **10**

a) List the four main component's of a typical SCADA system.

b) Define trends with respect to SCADA.

c) State the need of Electric drives in industries.

d) List any four network topologies used in industrial network communication.

e) State the need of VFD's in industries.

f) List any two names of commercial HMI manufacturers with their product name.

g) List any four applications of SCADA.

Marks

2. Attempt any THREE of the following: **12**

a) Draw the block diagram of RTU in SCADA. Give it's function.

b) What is bus topology? Explain with neat diagram.

c) Explain four data handling features of a good HMI pannel.

d) What is single acting pneumatic cylinder? Explain with diagram.

3. Attempt any THREE of the following: **12**

a) Draw block diagram of MTU and explain its function.

b) What is star topology? Explain with a neat diagram.

c) List benefits of HMI in automation.

d) Explain with a neat diagram how single acting pneumatic cylinder's are interconnected to PLC.

4. Attempt any THREE of the following: **12**

a) What is industrial automation hierarchy? Explain with neat diagram.

b) What is Modbus? List it's types with their features.

c) Draw and explain a typical connection diagram between HMI panel with PLC and PC.

d) Prepare PLC ladder program for temperature control system assuming suitable component's.

e) Explain double acting pneumatic cylinder with neat diagram.

Marks

5. Attempt any TWO of the following: **12**

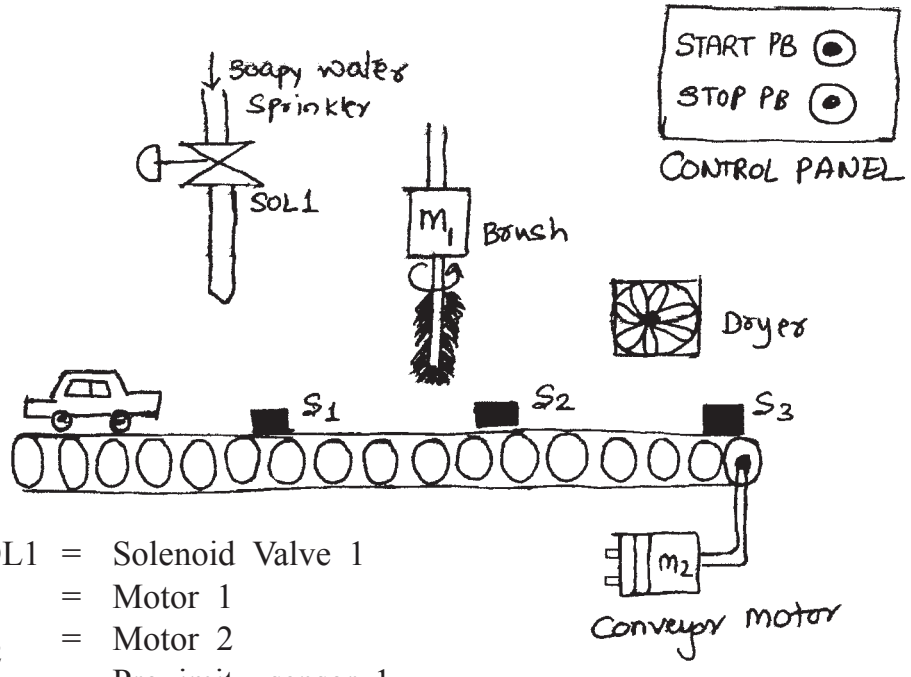
a) Develop PLC based application for sorting system conveyor. Assume suitable component's.

b) For a car washing system given bellow in Fig. No. 1, prepare the following:

i) PLC ladder program

ii) OPC tag data base

Automatic CAR Washing System:



SOL1 = Solenoid Valve 1
M_1 = Motor 1
M_2 = Motor 2
S_1 = Proximity sensor 1
S_2 = Proximity sensor 2
S_3 = Proximity sensor 3

Fig. No. 1

c) Draw architecture of OPC server and list it's function.

Marks

6. Attempt any TWO of the following: **12**

a) Compare AC and DC drives on any six points.

b) Compare Modbus, profibus and foundation field bus protocol. (Any three points)

c) For a water level control system given below, prepare the following consider Fig. No. 2.

i) PLC ladder program

ii) OPC tag data base

Level Control System:

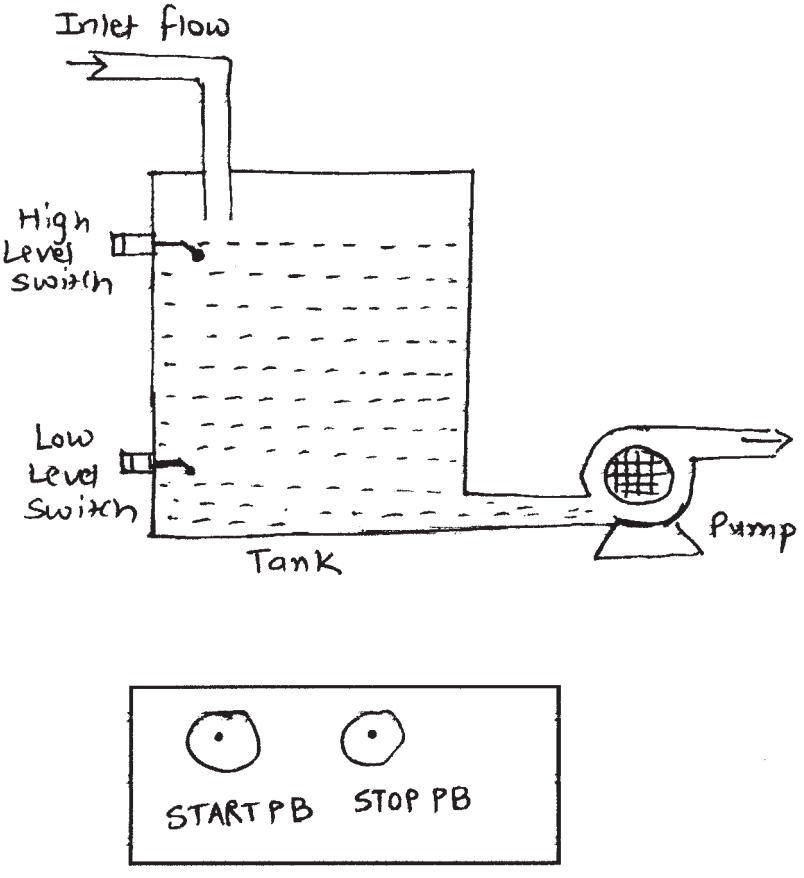


Fig. No. 2