

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Winter 2022 - 23 Examination

Semester: 7

Subject Code: 203122403

Subject Name: Industrial Automation

Date: 06/10/2022

Time: 10:30 am to 01:00 pm

Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions - (Fill in the blanks, one word answer, MCQ-not more than Five in case of MCQ) (All are compulsory) (Each of one mark) **(15)**

1. Which kind of production system is required for Automation Systems?
a) Batch Production, b) Job Production, c) Mass Production, d) None of the above
2. Control Engineering is applied to a wide range of physical systems from _____
a) Electrical Circuits to Guided Missiles to robots, b) Electrical Circuits, c) Guided Missiles to robots, d) Mechanical Designs to Guided Missiles to robots
3. What does the term CPC stands for
a) Complex Process Control, b) Complicated Processing Control, c) Composite Process Control, d) Composite Processing Control
4. SCADA systems are used to monitor and control the equipment in the industrial process which includes
a) Manufacturing, b) Production, c) Development and Fabrication, d) All of the Above
5. A PLC Scan Process Includes the following Steps in a sequence
a) Start Cycling Time Monitoring – Read Data from Input Module – User Program Working - Write data into output module – Other tasks,
b) Start Cycling Time Monitoring – Read Data from Input Module – Write data into output module - User Program Working – Other tasks,
c) User Program Working – Start Cycling Time Monitoring – Read Data from Input Module – Write data into output module - Other tasks,
d) Read Data from Input Module – Write data into output module - User Program Working – Start Cycling Time Monitoring – Other tasks
6. Ladder Logic is also known as _____
7. In case of PLC, ___ term is used for down counter function
8. What is full form of DCS
9. In PLC 'OND' term stands for
10. What is the minimum number of gates required to implement the Boolean function $(AB+C)$ if we have to use only 2-input NOR gates?
11. Highlight different scope of automation in industry?
12. Classify the I/O modules of PLC.
13. Consider a system where there has to be no output when any of four sensors gives an output, otherwise there is to be an output.
14. Differentiate between sourcing and sinking
15. Which is the most popular language in PLC programming?

Q.2 Answer the following questions. (Attempt any three) **(15)**

- A) What is the difference between RS-232, RS-422 and RS-485?
- B) What is latching? Give the significance of using latching in PLC programming
- C) Comment on the advantages of introducing in process control in industrial automation.
- D) What is the type of control in SCADA?

Q.3 A) Draw and explain Architecture of PLC. **(07)**

- B) List down the advantages and disadvantages of Programmable Logic Controllers.
- (08)**

OR

- B) Draw ladder logic explaining the following program sequence:
- (08)**

Consider the problem of items passing along a conveyor belt. The passage of an item past a particular point is registered by the interruption of a light beam to a photoelectric cell, and after a set number there is to be a signal sent informing that the set count has been reached and the conveyor.

Q.4 A) Briefly explain the Counters used in Programmable Logic Controllers. Explain the different terms associated with Counters. **(07)**

OR

A) Develop the ladder logic for Traffic Light Control. **(07)**

B) Give difference between Continuous Control, Discrete-State Control and Composite Control. **(08)**