

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

Semester: 7**Subject Code: 203113403****Subject Name: Programmable Logic Controllers****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. The PLCs were originally designed to replace:
2. In a ladder diagram an output would be represented by:
3. The basic difference between a PLC and a relay logic is that:.
4. The logical OR function is similar to
5. The limit switch is -----
6. Solenoid Valve is -----Output
7. The scan time of PLC depends upon:
8. In up counter instruction the accumulated value will increase only when:
 - a: There is complete transition from low to high
 - b: There is complete transition from high to low
 - c: Can't Say
 - d: None
9. The accumulator bit is available in:
 - a: Counters
 - b: Timers
 - c: Both timers and counters
 - d: None
10. Input modules provide an interface between:
 - a: Field equipment and the CPU
 - b: Input modules and the CPU
 - c: Output modules and the field devices
 - d: None
11. The standard control signal range used for PLC analog inputs is:
 - a: 3- 15 psi
 - b: 0- 20 mA
 - c: 4-20 mA
 - d: None
12. The data type of Enable Out is:
 - a: BOOL
 - b: REAL
 - c: INT
 - d: None
13. Traffic Control is example of ----- control system.
 - a: Open loop
 - b: Cascade
 - c: Closed loop
 - d: None of these
14. In retentive timer, what happens in case of input/ supply failure?
15. The instruction used for determining the remainder of division is:

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

- A) Give a detail study of PLC Hardware and it's in Interfacing.
- B) Turn ON light L1 when push button PB1 is pressed. Turn ON light L2 when push button PB2 is pressed. Interlock the pushbutton so that L1 and L2 cannot be turned ON at the same time.

C) Explain RS 232?

D) What's the position of I/O modules in PLC?

Q.3 A) Motor A should go ON when an ON push button is pressed. It should go off when an off button is Pressed. As soon as motor A is switched off, motor B should go ON and it should run for 10 seconds and switched off. **(07)**

B) Develop a program that will latch on an output B 20 seconds after input A has been turned on. After A is pushed, there will be a 10 second delay until A can have any effect again. After A has been pushed 3 times, B will be turned off. **(08)**

OR

B) A motor will be controlled by two switches. The Go switch will start the motor and the Stop switch will stop it. If the Stop switch was used to stop the motor, the Go switch must be thrown twice to start the motor. When the motor is active a light should be turned on. The Stop switch will be wired as normally closed. **(08)**

Q.4 A) Develop, Simulate and Test Ladder diagram for Bottle Filling system. **(07)**

OR

A) Develop Simulate and Test Ladder diagram for Batch Mixer. **(07)**

B) Develop, ladder programming for basic logic gate **(08)**