

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER– VI EXAMINATION – SUMMER 2026****Subject Code:3161714****Date:22-05-2026****Subject Name:Programmable Logic Controller and Supervisory Control and Data Acquisition System****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) What is PLC? Briefly explain its requirement in industrial automation	03
	(b) Explain the difference between PLC I/O module and SCADA RTU.	04
	(c) What is SCADA? With suitable functional block diagram explain it in detail. Also explain its applications in brief.	07
Q.2	(a) Explain the difference between microcontroller and PLC based control.	03
	(b) Which are special purpose modules in PLC? Explain any one in brief.	04
	(c) Draw and explain the functional block diagram of PLC and also explain its applications in industrial automation.	07
	OR	
	(c) Explain timers in PLC. Also draw timing diagram and ladder diagram for the process in which a motor should start after 10 seconds of pressing push button switch.	07
Q.3	(a) List out various output devices for PLC.	03
	(b) Explain various mathematical instructions for PLC programming.	04
	(c) With suitable diagram explain the process of automatic bottle filling in beverage industry. For this application prepare a proper table of inputs and outputs (tag table) and based on that draw and explain PLC ladder diagram for the same process.	07
	OR	
Q.3	(a) List out various input devices for PLC.	03
	(b) Briefly explain various conversion instructions in PLC programming.	04
	(c) Draw a process diagram for any industrial process. Explain its tag table i.e. with suitable list of inputs and outputs. Then draw a ladder diagram for automation implementation in that process. Students can mention suitable and appropriate assumptions if any for any industrial process	07
Q.4	(a) What is the purpose of electrical isolation in PLC? How it is provided? Explain it in brief.	03
	(b) Explain various types of timers in PLC.	04
	(c) List out at least 5 brands/names of vendors of PLC and explain in brief various important features in those PLCs.	07
	OR	
Q.4	(a) Briefly explain the concept of Master Control Relay.	03
	(b) Explain various types of counters in PLC.	04
	(c) With suitable diagram explain the concept of networking in PLC in detail.	07
Q.5	(a) Briefly explain RTU in SCADA.	03
	(b) Explain analog module in PLC.	04

- (c) With suitable diagram explain 2 axis robot with PLC control. **07**
- OR**
- Q.5** (a) Briefly explain alternative programming languages in PLC (i.e other than ladder diagram programming) **03**
- (b) Explain PID Control module in PLC. **04**
- (c) With suitable diagram explain 3 axis industrial robot with PLC control **07**
