

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII(NEW) EXAMINATION – SUMMER 2019****Subject Code:2171103****Date:14/05/2019****Subject Name:Industrial Automation****Time:02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

MARKS

- Q.1** (a) Explain the working principle of stepping motor with neat diagram. **3**
(b) Explain four major configurations of Industrial Robots. **4**
(c) Explain the basic principles of a Servo. Also explain DC Servo Motors. **7**
- Q.2** (a) What are the advantages of DCS? **3**
(b) Explain the working principle of Time-difference Type Ultrasonic Flow Meter. **4**
(c) Explain use of solenoid as an electrical actuator. How it is used to change gears? **7**
- OR**
- (c) Draw the architecture of PLC and explain each block in detail. **7**
- Q.3** (a) Write a short note on Man Machine Interface (MMI). **3**
(b) Explain any one Displacement Transducer with neat diagram **4**
(c) What do you mean by IoT? How it is useful in industrial automation? **7**
- OR**
- Q.3** (a) Explain construction and operation of magnetic flow meter with diagram. **3**
(b) What do you mean by data highway? What are the advantages of fiber optics over coaxial cable in data highway design? **4**
(c) Explain the basic principle of Mechanical Tachometers used for the speed measurement. Explain any two in detail with neat diagrams. **7**
- Q.4** (a) List the system characteristics that need to be analyzed for selection of PLC. **3**
(b) Explain computer based data acquisition (DAQ) system. **4**
(c) Explain the concept of serial and parallel transmission techniques used for communication between two intelligent devices. **7**
- OR**
- Q.4** (a) Explain RTD with neat diagrams. Write down the equation for the relationship between Temperature and Resistance of conductor. **3**
(b) Explain various advantages of field bus and explain any three field buses. **4**
(c) Develop a Ladder Diagram for the Parking Lot with a PLC which counts the number of cars that enter and exit and if the parking lot is about to be full, PLC sends a signal to an electronic board to say that the parking is full. The system is also utilizing an infrared sensor to open the gates with remote control. The capacity of this parking lot is assumed to be 10 cars. **7**
- Q.5** (a) What is Automation? Enlist various automation systems and explain any two in details. **3**
(b) Explain various applications of signal conditioning circuits in DAQ. **4**
(c) Explain SCADA architecture in detail. **7**
- OR**
- Q.5** (a) Compare RS-232C interface with RS-485 interface. **3**
(b) Explain basic distributed control system. **4**
(c) Discuss in brief about the various types of information display that can be achieved using DCS for efficient monitoring of plant parameters. **7**
