

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2018****Subject Code: 2171103****Date: 19/11/2018****Subject Name: Industrial Automation****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.

- Q.1** (a) What is an Industrial Automation? Give Automation's impact and explain their classification, also. **03**
- (b) What is robot? & Explain Basic construction and configuration of robots. **04**
- (c) What do you mean by SCADA system? Explain basic SCADA architecture and typical features. **07**
- Q.2** (a) What is a PLC? Draw block diagram of PLC. Explain each block in detail. **03**
- (b) Explain welding robot and Pick & place robot? **04**
- (c) Describe the role and elements of computer-aided measurements and control with an example. **07**

OR

- (c) Describe with neat sketches, the construction and working principle of magnetic flow meter. Also discuss its advantages and disadvantages. **07**
- Q.3** (a) How pH measurement is done? Explain it in brief. **03**
- (b) Differentiate Power MOSFET & IGBT. **04**
- (c) List the different types of speed-measuring devices. Explain, with neat sketches, the construction and working of any two of them. **07**

OR

- Q.3** (a) What do you mean by IoT ? How it is useful in industrial automation? **03**
- (b) What do you mean by (i) Smart sensors (ii) MODBUS (iii) PROFI-BUS **04**
- (c) What is sensor & Actuator? List various types of sensor & Explain construction and operation of Resistance thermometer. **07**
- Q.4** (a) Write the difference between PLC & DCS? **03**
- (b) List standard interface & Compare RS232 & RS485 interface. **04**
- (c) Develop a PLC ladder diagram for ON-OFF operation of Motor by using **07**
1. START-NO; STOP-NO push buttons.
 2. START-NC; STOP-NC push buttons.

OR

- Q.4** (a) What are general rules to be followed during PLC installation? **03**
- (b) List the PLC Programming Languages & Draw any four symbols of ladder Diagram. **04**
- (c) A process fan P is to run only when all of the following conditions are met. **07**
- ☐ Input 1 is off.
 - ☐ Input 2 is on or input 3 is on, or both 2 and 3 are on.
 - ☐ Inputs 5 and 6 both are off.
 - ☐ One or more of inputs 7, 8 or 9 is on.
- Obtain PLC Ladder Logic diagram for this problem.
- Q.5** (a) Explain Scan cycle of PLC? **03**
- (b) Why isolation is required in I/O Bus? Explain I/O Bus isolation using opto-coupler. **04**
- (c) Write short note on AC & DC drive. **07**

OR

- Q.5 (a) Explain features and advantages of DCS systems. **03**
(b) Discuss about the various types of displays that can be achieved using DCS **04**
for efficient monitoring of plant parameters.
(c) What do you mean by data highway? Explain role of fiber optic in data **07**
highway design and advantages of using fiber optic over twisted pair and
coaxial cable.

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