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GUJARAT TECHNOLOGICAL UNIVERSITY  BE - SEMESTER-VII (NEW) - EXAMINATION – SUMMER 2017  Subject Code: 2171103 Date: 02/05/2017  Subject Name: Industrial Automation(Departmental Elective - II)  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.			
Q.1		What do you mean by SCADA system? Explain basic SCADA architecture and	07
	<b>(b)</b>	typical features.  What do you mean by pick and place robot? With the help of simple block diagram explain its parts and working in brief.	07
Q.2	(a)	Explain liquid flow measurement principle. Explain construction and operation	07
	<b>(b)</b>	of magnetic flow meter with diagram.  Explain working of full wave SCR circuit with waveforms. Explain how to achieve trigger control using opto-coupler.	07
	<b>(b)</b>	OR Explain use of solenoid as an electrical actuator. How it is used to change gears?	07
Q.3	(a)	With the help of block diagram explain basic elements of computer aided measurement and control system. Explain automation hierarchy of computer aided process control.	07
	<b>(b)</b>	With the help of block diagram describe typical interfaces of a process control computer.	07
Q.3	(a)	<b>OR</b> Explain operations performed by ADC while converting analog signal to digital.	07
Q.S	` ,	For a 3-bit ADC draw and explain transfer characteristics and from that explain quantization error and its effect.	
	<b>(b)</b>	What do you mean by (i) Smart sensors (ii) MODBUS (iii) PROFI-BUS?	07
Q.4	(a)	Explain I/O bus isolation in PLC. How it is achieved in input and output modules of PLC using opto-coupler?	07
	<b>(b)</b>	Develop PLC Ladder Logic diagram for a start/stop of a motor using toggle switch. State its disadvantage. Explain with the Ladder Logic diagram how to overcome it using Start-Stop-Seal (Latch).  OR	07
Q.4	(a) (b)	With the help of diagram explain I/O sourcing and sinking in PLC.  A process fan P is to run only when all of the following conditions are met.  Input 1 is off.	07 07

• Input 2 is on or input 3 is on, or both 2 and 3 are on.

Inputs 5 and 6 both are on.

One or more of inputs 7,8 or 9 is on. Obtain PLC Ladder Logic diagram for this problem.

What do you mean by data highway? Explain role of fiber optic in data highway Q.5 (a) **07** design and advantages of using fiber optic over twisted pair and coaxial cable. (b) What do you mean by man-machine interface (MMI)? How it helps integration **07** 

of DCS with PLC?

Q.5 (a) What do you mean by IoT? How it is useful in industrial automation?

07 ans 07

**(b)** Explain the use of electric current and pneumatic pressures as a common means of information transmission in an industrial environment. What is advantage of using current as a transmission signal instead of voltage?

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