GANPAT UNIVERSITY

B. Tech. Semester: VII (Electrical Engineering)

Regular Examination Nov.-Dec -2015

2EE 703, Industrial Instrumentation & Automation

Marks-70

Instruction: 1. Attempt all questions.

2. Figures to the right indicate full marks.

Section-I

Q-1	A	Draw the ladder rungs to represent: 1). A motor is switched on by pressing a spring return push button start switch and the motor remains on until another spring return push button stop switch is pressed. 2). A lamp is to be switched on if there is an input from sensor A or sensor B.	6
	B	How is flow measured using ultrasonic flow meters.	6

OR

Q-1	A	Discuss the architecture of SCADA system.	6
	B	How are transducers classified. What are basic requirements in a transducer.	6
Q-2	A	State and explain the characteristics of the relay, transistor and triac types of PLC output channels.	6
	B	Devise a ladder program that will give an output when the number of people in a store reaches 75, where continually people are entering and leaving the store.	5

OR

Q-2	A	Discuss briefly the principle of operation of optical sensors.	6
	B	Devise a ladder program to switch on a pump when the water level in a tank rises above 1.5 m and switch it off when it falls below 1.2 m.	5
Q-3	A	Discuss the block diagram of smart sensors.	6
	B	How is the controlling and monitoring of gas lift system done using SCADA.	6

Section-II

Q-4	A	How is pressure measured using a bourdon tube and a bellows element?	6
	B	Discuss the principle of operation of a load cell used for force measurement.	6

OR

Q-4	A	Explain construction and working of an LVDT . What are its merits and de-merits.	6
	B	Discuss functioning of a rotameter for flow measurement.	6
Q-5	A	What are piezoelectric materials? Draw the equivalent circuit of a piezoelectric transducer and derive the expression for the output voltage.	6
	B	Explain principle of operation of a strain gauge accelerometer.	5

OR

Q-5	A	What is Hall effect? Discuss working of a Hall effect transducer for displacement measurement.	6
	B	How is reference junction compensation done in a thermocouple?	5
Q6	A	Write a note on thermistor applications.	6
	B	Define gauge factor of a strain gauge and obtain its expression.	6

END OF PAPER