

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V(New) • EXAMINATION – WINTER 2016

Subject Code:2153406

Date:22/11/2016

Subject Name:Mechatronics

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.

MARKS

Q.1 Short Questions

14

- 1 Define Range
- 2 Orifice plates are usually made of
 - (a) Stainless steel
 - (b) Copper
 - (c) Plastic materials
 - (d) None of these.
- 3 A thermocouple gauge is one type of
 - (a) Ionization gauge
 - (b) Thermal conductivity gauge
 - (c) McLeod gauge
 - (d) None of these.
- 4 Define Accuracy.
- 5 In a capacitive thickness gauge the capacitance is
 - (a) Directly proportional to the dielectric constant
 - (b) Inversely proportional to the distance between two capacitors
 - (c) Both (a) & (b)
 - (d) None of these
- 6 A pressure lower than atmospheric pressure is called_____
- 7 In an open loop control system
 - (a) The input has control over output
 - (b) Input has no control over output
 - (c) Both are true
 - (d) None of these
- 8 The output of electrical transducer is in the form of
 - (a) Voltage
 - (b) Current
 - (c) Both voltage and current
 - (d) None of these
- 9 Passive transducer generate self energy. True or False
- 10 A ladder diagram is used as a
 - (a) PLC programming
 - (b) Storage facility
 - (c) Communication facility
 - (d) None of these
- 11 Define error.
- 12 Define calibration.
- 13 Define Sensitivity.
- 14 Define Reproducibility

- Q.2** (a) Explain Conductor and Insulators.
(b) Explain Heat treatment processes.

03

04

	(c) Explain open loop and closed loop control system with block diagram.	07
	OR	
	(c) Explain the design process of a mechatronics system.	07
Q.3	(a) Explain Gears and its types.	03
	(b) Explain Potentiometric pressure transducer.	04
	(c) Explain Strain gauge load cell with diagram.	07
	OR	
Q.3	(a) Explain Cam and its types.	03
	(b) Explain capacitive pressure transducer.	04
	(c) Explain Linear Variable differential transducer.	07
Q.4	(a) Explain Thermocouple.	03
	(b) Explain Proportional control mode in details with diagram	04
	(c) Explain Different logic function used in PLC.	07
	OR	
Q.4	(a) Explain Bimetallic strip.	03
	(b) Explain Derivative control mode in details with diagram.	04
	(c) Explain Timers & counters in PLC.	07
Q.5	(a) Brief explanation about basic components of robot.	03
	(b) Explain Forward and Reverse kinematics in Robotics.	04
	(c) Explain Pick and Place robot in details.	07
	OR	
Q.5	(a) Explain any three degree of freedom.	03
	(b) Explain non-servo control of robotic control system.	04
	(c) Explain Car engine management system in details.	07
