

Total No. of Questions :08]

SEAT No. :

P3588

[5560]-542

[Total No. of Pages : 2

T.E. (Electronics)

**INSTRUMENTATION SYSTEMS
(2015 Course) (End Sem) (304202)**

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*

- Q1)** a) What do you mean by calibration? What are its types? List advantages & disadvantages of calibration. [6]
- b) Draw and explain signal conditioning for RTD Temperature sensor? [6]
- c) How do you can measure a flow of a liquid by using ultrasonic sensor. Draw a set-up diagram How ultrasonic sensor measures the flow? [8]

OR

- Q2)** a) Draw a detailed block diagram of instrumentation system. [6]
- b) Which are the interfacing techniques of temperature sensor with microcontroller. Draw any one of it. [6]
- c) Derive Bernoulli's equation for flow measurement? Explain venturi tube in brief? [8]

- Q3)** a) Extend your views on CCD & CMOS image sensor. With its applications. [8]
- b) What is accelerometer? List its type? Explain piezoelectric accelerometer with neat diagram? [8]

OR

- Q4)** a) How a motion can be detected by a capacitive detector? Explain experimental set-up for motion detection using ultrasonic sensor? [8]
- b) Explain working of photo diode & photo transistor used in light detection? [8]

P.T.O.

- Q5)** a) What is MEMS? Explain with neat diagram bulk-Micromachining and surface micromachining? [8]
b) With neat diagram explain Hot wire anemometer? [6]
c) Draw a basic block diagram of SMART sensor. [4]

OR

- Q6)** a) List magnetic field sensor? Explain any one in detail. [8]
b) Draw and explain working of surface micromachine accelerometer. [6]
c) List the advantage & disadvantages of Micromachine sensors? [4]

- Q7)** a) List types of actuators? Explain with neat diagram any one process control valve? [8]
b) What is final control element? Draw and explain working and construction of double acting cylinder? [8]

OR

- Q8)** a) Explain in brief electrical actuators. [8]
i) Dc motor
ii) Stepper motor
b) Draw pneumatic symbols for:
i) Air supply
ii) Exhaust air
iii) 3/2 valve
iv) Spring return
v) 5/2 valve
vi) Push button
vii) Shuttle valve
viii) Check valve

