Total No. of Questions : 8] **SEAT No. :**

P3353 **[Total No. of Pages : 3**

[5353]-542
T.E. (Electronics)
INSTRUMENTATION SYSTEMS
(2015 Pattern) (End Semester)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of logarithmic tables Slide Rule, mollier Charts, electronic pocket calculator and steam table is allowed.***
5) ***Assume suitable data if necessary.***

Q1) a) Draw block diagram of basic instrumentation system. Explain each block in detail. **[6]**

b) With the help of neat sketch explain signal conditioning of RTD. **[6]**

c) Explain with neat sketch working principle of rotameter. **[8]**

OR

Q2) a) Define the terms & draw a neat sketch. **[6]**

i) Sensitivity

ii) Linearity

iii) Precision

b) Explain working principle of electronic nose with the help of neat block diagram. **[6]**

c) Explain with neat sketch working principle of pitot static tube. **[8]**

Q3) a) Explain construction & working of LVDT. How LVDT can be used for pressure measurement. **[8]**

P.T.O.

b) Write a short notes on - **[8]**

i) Piezoelectric accelerometer.

ii) Capacitive accelerometer.

OR

Q4) a) Explain with neat sketch, how rotary encoder is used for measurement of speed of shaft in RPM? **[8]**

b) Write a short note on - **[8]**

i) CMOS image sensor

ii) Gas flame detector.

Q5) a) Explain working principle of PZT actuator. **[6]**

b) Write a short note on bulk micromachining. **[6]**

c) Explain with neat diagram working of MEMS hot wire anemometer. **[6]**

OR

Q6) a) What do you mean by SMART sensor? Explain SMART sensor system in detail. **[6]**

b) Explain MEMS absolute pressure sensor. **[6]**

c) What is MRE? Explain it's working & application. **[6]**

Q7) a) Draw control valve characteristics and explain the terms. **[8]**

i) Quick opening

ii) Linear &

iii) Equal percentage

b) Explain control of single acting cylinder using appropriate directional control valve. **[8]**

OR

Q8) a) Write a short notes on : **[8]**

i) Solid state relay

ii) Solenoid actuator

b) Draw a pneumatic circuit symbol and explain with neat diagram working of poppet valve. **[8]**