Total No. of Questions : 10]

SEAT No. :

P1723

[Total No. of Pages : 2

[5058]-356
T.E.(Electronics)
INSTRUMENTATION SYSTEMS
(2012 Course) (End Semester)(304209)(Semester-II)

Time : 2.5 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.No.1 or Q.No.2, Q.No.3 or Q.No.4, Q.No.5 or Q.No.6 Q.No.7 or Q.No.8 and Q.No.9 or Q.No.10***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Use of Calculator is allowed.***
5) ***Assume Suitable data if necessary.***

Q1) a) List various temperature sensors. Explain non-contact type of temperature measurement using optical pyrometer. **[5]**

b) Explain the following static characteristics of measuring instruments. **[5]**

i) Linearity
ii) Sensitivity
iii) Drift
iv) Resolution
v) Hysterisis

OR

Q2) a) Explain the different fundamental standards and units for common physical parameters. **[5]**

b) A transparent bottle moving on a conveyor is to be sensed using a proximity sensor. Suggest a suitable proximity sensor and also explain working principle of the chosen sensor. **[5]**

Q3) a) An Airbus 330 jetliner uses pitot tube for the measurement of airspeed. Explain with suitable diagram working principle of pitot tube. **[5]**

b) Explain construction and working of electromagnetic flow sensor. **[5]**

OR

Q4) a) State working principle of thermocouple. Explain how cold junction compensation is achieved for thermocouple. **[5]**

b) Explain capacitive sensor for level measurement when,

i) Liquid is conducting
ii) Liquid is not conducting **[5]**

P.T.O.

Q5) a) Draw a neat sketch of (i) Orifice plate (ii) Ventury tube (iii) Flow nozzle. Explain working principle of orifice plate as a flow sensor. **[8]**

b) Write short note on: **[8]**

i) Micro-machined hot wire anemometer.

ii) Magnetic field sensors.

OR

Q6) a) Explain the steps involved in surface micromachining of MEMS accelerometer. Draw a neat sketch of MEMS accelerometer. **[8]**

b) Write short notes on: **[8]**

i) Micro-machined absolute pressure sensor.

ii) Smart sensors.

Q7) a) Explain how simultaneous analog and digital communication is achieved with HART protocol? **[8]**

b) Write short notes on: **[10]**

i) I^2C bus.

ii) Profibus.

OR

Q8) a) Explain with neat diagram working principle of electro-pneumatic converter. **[8]**

b) Write short notes on: **[10]**

i) RS 232 standard.

ii) IEEE 488 bus.

Q9) a) What is actuator. Explain with diagram working of

i) Spring diaphragm actuator **[4]**

ii) Piston actuator **[4]**

b) Explain principle of operation of DC motor. State various types of D.C. motor. **[8]**

OR

Q10)a) Explain with neat diagram working of poppet valve. Draw the symbol for a 2/2 valve and a 3/2 valve. **[8]**

b) A 5V control signal is to be used to turn ON and OFF a solenoid valve operating on 230VAC. Explain a relay driver circuit which can be used for this application. **[8]**

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