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

P1321 [Total No. of Pages : 3

[4858] - 1056
T.E. (Electronics)
INSTRUMENTATION SYSTEMS
(Semester - II) (End Sem.) (2012 Pattern)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) a) Differentiate between active and passive transducers. **[4]**

b) Explain bourdon tube pressure transducer. Explain the technique to obtain electrical output from a bourdon tube. **[6]**

c) An RTD has $\alpha = 0.004/^{\circ}C$. If R = 106 Ω at 20°C, find the resistance at 25°C and 100°C. **[4]**

d) Explain advantages and Limitations of LVDT. **[6]**

OR

Q2) a) Define the following terms:

i) Repeatability

ii) Linearity

iii) Hysteresis

iv) Drift **[6]**

b) Explain the different fundamental standards and units for common physical parameters. **[7]**

c) Explain doppler effect type of ultrasonic flow meter. **[7]**

P.T.O.

Q3) a) Explain generic architecture of SMART sensors. **[6]**

b) Explain the steps involved in surface micromachining of MEMS accelerometer. Draw a neat sketch of MEMS accelerometer. **[6]**

c) Explain MEMS magnetic field sensors. **[4]**

OR

Q4) a) Explain with neat diagram surface micro machined hot wire anemometer. **[6]**

b) Explain the steps involved in bulk micromachining of MEMS pressure sensor. Draw a neat sketch of MEMS pressure sensor. **[6]**

c) Draw LM 75 block diagram and give its specification. **[4]**

Q5) a) State the specifications of Profibus network. Explain Profibus architecture. **[6]**

b) Explain the working of I to P converter. **[6]**

c) Write a short note on RS 232 standards. **[6]**

OR

Q6) a) Explain HART communication protocol. **[6]**

b) Explain with neat block diagram Data Acquisition system. **[6]**

c) Write a short note on IEEE488 standard Bus. **[6]**

Q7) a) What are actuators? Give their classification and explain piston actuator in detail. **[6]**

b) Explain principle of operation of Stepper motor. State important selection criterion of stepper motor. **[6]**

c) Draw neat diagram of:

i) Spool valve

ii) Poppet valve **[4]**

OR

Q8) a) Explain how a single acting cylinder can be actuated by a solenoid operated directional control valve. **[6]**

b) Explain the role of relays and solenoid valves with any one application. **[6]**

c) Draw control valve characteristics and state the meaning of the terms - linear, equal percentage and quick opening characteristics. **[4]**

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