No. of Printed Pages: 2

[69]

SARDAR PATEL UNIVERSITY

M.Sc. (Instrumentation) Semester-I Examination

PS01CINS01 (Transducers and Instrumentation)

Friday, 30th November 2012

10.30 am to 1.30 pm

Total Marks: 70

Que.1 Choose a correct option for the questions given below: 8

1. Inside a capacitance pressure device, a transducer converts changes in pressure into a proportional change in:
   a) Voltage b) Capacitance
   c) Resistance d) Current
2. Synchros and Resolves are ac electromechanical, Variable coupling transformer devices primarily employed for
   a) Angular data transmission b) Linear data transmission
   c) Linear data transmission only d) None of the above
3. The sensitivity of LVDT is proportional to the
   a) Frequency b) Voltage
   c) Frequency and primary current d) Primary current
4. Anemometers are basically _____ measuring devices.
   a) Temperature b) Density
   c) Velocity d) Humidity
5. The sensitivity of piezoelectric crystal is defined as the ratio of the
   a) Electrical output to the mechanical input
   b) Mechanical output to the mechanical input
   c) Electrical output to the electrical input
   d) None of the above
6. Optical pyrometer is _____ transducer.
   a) Non-contacting displacement b) Contacting Pressure
   c) Velocity d) None of the above
7. The Hall effect belongs to one of the _____ phenomena.
   a) Magnetic b) Galvanomagnetic
   c) Electrical d) None of the above
8. The response time of photomultiplier tube is of the order of
   a) 10^{-1} sec b) 10^{-20} sec
   c) 10^{-8} sec d) None of the above

Que.2 Answer any seven in brief: 14

A. State the basic requirements of Transducers.
B. Give the characteristic of Random vibrations and Shock.
C. List various Pressure Transducers.
D. State the principle on which Electromagnetic flow meter works.
E. Briefly compare Thermocouple and Thermistor.
F. What are the Piezoelectric materials?
G. Explain the basic principle of Torque measurement. Also give the unit of torque.
H. Explain Photoconductive transducer in brief.
I. What are the Digital transducers?

PTO

Que.3	A	What are the various factors affecting the choice of transducers? Describe the theory and operation for resistance strain gauge.	6
	B	Explain Linear Variable Differential Transformer with basic construction, connection of secondary winding and transfer characteristics.	6
		OR	
	B	Differentiate between active and passive transducers with suitable examples. Give the classification of transducers and explain each in brief.	6
Que.4	A	What are the various elastic elements for pressure measurements? Explain in detail the principle and working of variable capacitance type pressure sensor.	6
	B	Based on which parameters flow meters are classified. Describe the principle and working of head type flow meter.	6
		OR	
	B	What are the various elastic elements for pressure measurement? Discuss Diaphragms.	6
Que.5	A	Give the basic principle, the construction and working of Platinum Wire Resistance Thermometer.	6
	B	What is Load cell? Give its classification. Explain the principle and working of Proving ring type load cell.	6
		OR	
	B	State the operating principle of Piezoelectric Transducer. Write a detailed note on Piezoelectric pressure transducers.	6
Que.6	A	What is Hall Effect? Explain Hall effect transducer with suitable application.	6
	B	What is photoemissive transducer? Explain any two photoemissive transducers.	6
		OR	
	B	What is photoelectric phenomenon? Write a note on Nuclear Radiation Transducers.	6

Best Wishes