

Thapar Institute of Engineering & Technology, Patiala
Electrical & Instrumentation Engineering Department

Measurement Science & Techniques ES – 205 Instructors : MD Singh

End semester Exam (Spl).

11th Dec 2006

Time: 3 Hrs.

Max Marks 50

- Attempt ANY FIVE questions in given sequence

- Q 1 a. Explain various elements of a generalized measurement system. 5
- Q 1 b. Explain the principle, construction and working of RTD. 5
- Q 2 a. Define Precision, Hysteresis and Accuracy. 3
- Q 2 b. Draw the Equivalent diagram of Piezo electric transducer. 3
- Q 2 c. How will you measure Voltage, frequency and Phase angle with CRO? 4
- Q 3 a. Draw the block diagram of CRO and explain its various function blocks. 5
- Q 3 b. What is Gaussian distribution curve of errors? Give its main features. Explain the concept of standard normal variate, and calculate integral probability at $z = 1$. 5
- Q.4 a. Write down a method to measure Torque. 3
- Q 4 b. Draw the pin diagram of opamp 741. 3
- Q 4 c. What are digital Transducers? Give their classification with diagrams.. 4
- Q 5 a. Write down Principle, construction and working of Rotameter. Also write its merits & Demerits. 5
- Q 5 b. Calculate the change in capacitance and sensitivity of the transducer used to measure angular displacement of 15° . Diameter of both plates is 1 inch and plates are separated by distance of 0.25 inch. Given $\epsilon = 3.183 \times 10^{-5}$ F/cm. 5
- Q 6 a. Draw the circuit diagram of Instrumentation Amplifier using OpAmps and write down the final output equation. 5
- Q 6 b. In a Wheatstone bridge, three resistances are 250Ω , and one Strain Gauge of same resistance is used to measure temperature. If a 6V battery with negligible internal resistance is used in the circuit, and a galvanometer of 100Ω resistance measure $0.5\mu A$ current then measure the change in resistance. 5
- Q 7. Attempt ANY Four from the given questions.
- Give the significance of Telemetry.
 - Write down the classification of Display devices .
 - Explain any Electrical transducer to measure Pressure.
 - What is the significance of student's T-test?
 - Calculate the correlation coefficient between X and Y for given data 10

X	2	3	4	5	6	7	8
Y	4	7	9	12	14	17	20