Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-IV • EXAMINATION – SUMMER • 2014

Subject Code: 141702

Date: 25-06-2014

Subject Name: Transducers

Time: 10:30 am - 01:00 pm

Total Marks: 70

Instructions:

- 1. Attempt all questions.
- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.
- Q.1 (a) Justify the aim of measurement in the field of engineering. Explain each 07 functional elements of an instrument in detail.
 - (b) Define following terms in 1to 3 lines only w.r.t instrument performance.
 (1) Static error (2) Range (3) Speed of response (4) Linearity (5) Resolution
 (2) Fib lite (7) for tool
 - (6) Fidelity (7) System lag.
- Q.2 (a) (i) What is temperature as measuring variable? Define it. Also compare various 07 temperature scales.

(ii) Draw and Describe with limitation and benefits of mercury in glass thermometer.

(b) What is reference junction? Explain it with thermocouple based temperature 07 measurement system with its law, limitation and advantages.

OR

- (b) How industrial information transmitted? Explain working of current loop 07 electrical transmitter along with its diagram and advantages.
- Q.3 (a) What is final control element? List the available Final control element and 07 describe one of them with neat sketch.
 - (b) Why Optical pyrometer is required to measure Temperature? Draw and 07 describe it construction, limitation and working.

OR

- Q.3 (a) Classify level measurement technique. Explain with neat sketch air bubbler 07 method for water level measurement.
 - (b) What are the benefits we get if we use radiation type level measurement over 07 convention type technique? Draw and describe radiation gauge for solid level measurement.
- Q.4 (a) Distinguish absolute pressure and gauge pressure measurement? Describe 07 Inclined manometers with construction, head equation and its benefits.
 - (b) (i) What are the units of vacuum? List it. (ii) Draw and describe LVDT 07 OR
- Q.4 (a) (i) Why flow measurement is prime in Optimization and control? Justify it. 07 (ii) List the different flowmeter. Draw and Describe Variable rotameter with neat sketch, working and limitation.
 - (b) Explain the working of density meter with it construction and limitation 07
 - Q.5 (a) Describe one of the method for torque measurement with diagram, working 07 and performance evolution.
 - (b) Draw and describe Laser based thickness measurement technique.

OR

- Q.5 (a) Draw and describe pH scale. Distinguish pH Measurement using Reference- 07 measuring electrodes versus combined glass electrodes.
 - (b) Explain one of the viscosity measurement technique with its limitation and 07 benefits.

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