R09

Code No: C8801

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.Tech I - Semester Examinations, March/April 2011
TRANSDUCER TECHNOLOGY
(ELECTRONICS & INSTRUMENTATION)

Time: 3hours **Max. Marks: 60**

Answer any five questions
All questions carry equal marks

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1.a) Explain about the following pairs of terms bringing out the distinction between them clearly.
i) Accuracy-Precision
ii) Sensitivity-Resolution
iii) Repeatability – Reproducibility
iv) Gross errors – Systematic errors.
b) With the help of a block schematic, explain about a general instrumentation system. [6+6]

2.a) Explain about the constructional features of bonded strain gauges mentioning different materials used for filament wires base carrier material and strain gauge cements.
b) A resistance strain gauge is used to measure stress on steel. The steel is stressed to 1600 kgf/cm^2. Young modulus = 2×10^6 kgf/cm^2. Calculate the percentage change in resistance of strain gauge assuming the gauge factor to be 2.1. [8+4]

3.a) State and explain about the laws of the thermocouples.
b) Give the constructional details of a thermocouple with the help of a neat sketch. [6+6]

4.a) Explain about Piezoelectric effect and various materials inhibiting the same.
b) Define various piezoelectric coefficients and derive the relationships between them. [6+6]

5.a) Draw the sketch of a rotameter and explain its principle of working.
b) Give the schematic and explain the principle and working of Doppler anemometer in dual beam mode. [6+6]

6.a) Draw the circuit and explain the principle and working of LVDT. Mention the materials used and give the specifications of LVDT with typical values.
b) The output of LVDT is 1.50V at maximum displacement. At a load of 0.75Ω, the deviation of linearity is maximum and it is $\pm$ 0.003V. Determine the linearity at a given load. [8+4]

7.a) Explain the principle and working of humidity measuring Transducer.
b) How density measurement is done? Explain. [6+6]

8. Write notes on any Two
a) Quartz digital thermometers
b) Charge coupled sensors
c) PH measurement. [12]

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