BITS PILANI – DUBAI
ACADEMIC CITY, DUBAI
Comprehensive Examination

TRANSDUCERS & MEASUREMENT SYSTEMS
INSTR UC381

Date: 6/1/08
Time: 3 Hrs

Weigtage: 40%
Max Marks: 50

Answer ALL Questions
All Questions carry equal marks

1. (a) Explain the terms:
   Static sensitivity, Linearity, Threshold, resolution and Dead space.
   (b) Explain the measurement of displacement using strain gages.

2. (a) Describe a method to measure rotational velocity.
   (b) Draw the block diagram of a sound level meter and explain its working.

3. (a) Suggest a method for measuring density of a flowing liquid. Explain.
   (b) Draw the block diagram for pulse width measurement. Explain the same.

4. (a) Draw the circuit of an instrumentation amplifier and derive the expression for the output voltage.
   (b) Explain the working of a differentiator deriving appropriate equations.

5. Write short note on:
   (i) Electrical resistance sensors.
   (ii) Radio telemetry.

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TEST-2 (Open Book)

TRANSDUCERS & MEASUREMENT SYSTEMS- INSTR UC381

Date: 6/12/07
Time: 50mts

Weigtage: 20%
Max Marks: 20

Answer ALL Questions

1. Describe the construction of a load cell for measuring compressive forces. How do you achieve high accuracy. (5M)

2. Suggest a method to measure pressure using displacement measurement. Explain the same with a figure. (5M)

3. Flow measurement has to be done on a dense fluid in a disturbed state Suggest the technique of measurement and principle. (5M)

4. Suggest a transducer which can be used in the range -200 to $+1000^0$C. Explain the working along with characteristics. (5M)

5. Explain in detail how the level of powdered solids can be measured. (5M)

BITS PILANI-DUBAI
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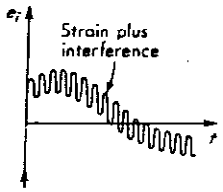
Test 1
Transducers & Measurement Systems INSTR UC381

Date : 21/10/07
Time: 50 Mts

Max Marks:50
Weightage: 25%

Answer ALL Questions
Attach the Semi log sheet to answer book

1. (a) What are the different features of (i) Theoretical methods (ii) Experimental methods. (5M)
   (b) Differentiate between Null and Deflection methods with suitable examples. (5M)
2. (a) Show the block diagram of a closed loop system and derive the expression for the output for a large gain. (5M)
   (b) The figure shows the output of a strain gage bridge 5Hz modulated by 50Hz. Suggest the filter characteristics which can obtain (i) Strain signal (ii) 50Hz interfering signal . Show the output of the filters (5M)

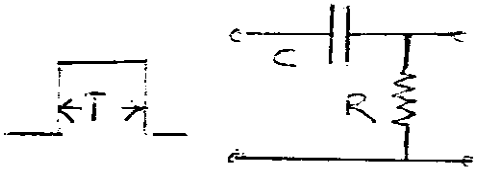


3. Draw the frequency response plot of

$$G(s) = \frac{100s}{(s+1)(s+10)}$$

(20M)

4. (a) Show the output of the first order system for $\tau >> T$, $\tau << T$ and $\tau = T$, where τ=RC is the time constant of the circuit. (5M)



(b) Derive the expression for the gage factor of a resistance strain gage. (5M)