BITS PILANI-DUBAI
DUBAI INTERNATIONAL ACADEMIC CITY, DUBAI
Test 1
Transducers & Measurement Systems   INSTR C381

Date: 12/10/08
Time: 50 Mts

Max Marks:25
Weightage: 25%

Answer ALL Questions
Start each question on a new page
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1. (i) Give a comparison of the features of Theoretical methods and Experimental methods. (3M)
   (ii) Give different types of experimental analysis problems. (2M)

2. Show the block diagram and derive necessary equations to demonstrate the fact that feedback can be used to reduce the effect of spurious inputs. (5M)

3. (a) Define the following:
   Static sensitivity, Linearity, Threshold, Noise floor (2M)
   (b) Derive the expression for the output of a First order instrument. and show the Step response for different τ. (3M)

4. Suggest suitable transducers to measure the following:
   (i) Displacement in mm's (ii) Angular displacement of 1 degree.
   Explain in detail the setup for such sensitive measurements. (5M)

5. Show the block diagram and explain in detail a method of measuring the diameter of an object. (5M)

BITS PILANI-DUBAI
DUBAI INTERNATIONAL ACADEMIC CITY, DUBAI
First Semester 2008-09
III Year- EIE
Test 2 (Open Book)
Transducers & Measurement Systems - INSTR C381

Date: 23/11/08

Time: 50 Mts

Max Marks: 25

Weightage: 20%

Answer ALL Questions
Start each question on a new page

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1. Describe the construction of a transducer for Force measurement having little sensitivity to off axis forces and moments. (5M)

2. Discuss various Torque sensor designs. (5M)

3. Explain the principle and constructional features of a gage that can measure a low pressure limit of 10^{-10} Torr. (5M)

4. Suggest and explain a flow measurement technique to measure blood flow in the vessels of living systems. (5M)

5. Describe a method to measure the temperature of hot gases in gas turbine combustors in which the temperature may be in the range 500 to 2000^0 C. (5M)

Name:
Id No:

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Quiz 1 ✔
Transducers & Measurement Systems   INSTR   C381

Date :   Max Marks:10
Time: 15 Mts   Weightage: 5%

1. Instrumentation can be classified in to three categories. What are they.

2. Give FOUR features of theoretical methods.

3. Show the block diagram of a feed back control system.

4. Give FOUR features of experimental methods.

5. Draw the block diagram showing functional elements in a measuring system.

6. Differentiate between Active and Passive transducers.

7. Define the following: Desired input, Interfering input, Modifying input.

8. A negative feedback system has $K_{FB}=10$. What is the relation between input and output.

9. Draw the ideal characteristics of a filter that can pass from 0Hz to 1KHz.

10. Draw the characteristics of a filter which can suppress 50 Hz noise. Show the characteristics.

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Quiz 2
Transducers & Measurement Systems   INSTR   C381

Date :
Time: 15 Mts

Max Marks:10
Weightage: 5%

1. What is a hybrid potentiometer.

2. Name FOUR types of strain gages.

3. Gage combinations are called _____.

4. The excitation of LVDT is normally a Sinusoidal voltage of _____ V amplitude and Frequency of _____.

5. Name the functions where synchros can be used.

6. Displacement in the range of micro inches can be measured with _____ sensor.

7. Name the materials used in making the load sensing member in a load cell.

8. Show the diagram for measuring force using variable reluctance.

9. LVDT load cells can be used to measure force in the range of _____.

10. Dynamic force measurements use _____ transducers.

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Quiz 3
Transducers & Measurement Systems   INSTR UC381

Date : 4/11/08   Max Marks:10
Time: 30 Mts   Weightage: 5%

Under water sounds have to be detected to study the behavior of marine animals. Suggest suitable transducer and system to monitor the sounds. Show the appropriate block diagram and necessary monitoring system.

Suggest the block diagram of the entire system. You have to give the following.

Transducer and its specifications,

Amplifying System,

Signal Processing,

Transmission System.

Date: 06/01/09   Max Marks: 40
Time: 3 Hrs   Weightage: 40%

Answer ALL Questions
Start each question on a new page

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1. (a) Derive the equation for the gage factor of a strain gage.   (4M)
    (b) Explain the construction and working of variable inductance pick up. (4M)

2. (a) Explain the working of a strain gage load cell with a figure.   (4M)
    (b) Why is Pirani gage used. Explain the working in detail.   (4M)

3. (a) Draw the block diagram of a Sound level meter and explain the same. (4M)
    (b) Discuss the working principle and construction of a turbine meter.   (4M)

4. (a) Discuss in detail the chopped(AC) broadband radiation thermometer. (4M)
    (b) Show the setup for measurement of pulse width. Explain the same.   (4M)

5. (a) Suggest a non contact type of measurement for liquid level. Show the
        setup and explain the same.   (4M)
    (b) Draw the block diagram of a FM/FM telemetry system and explain.   (4M)