

BOARD OF TECHNICAL EDUCATION

PORVORIM-GOA

November, 2008 Examinations

Programme: Electronics & Instrumentation

Course/Subject: Basic Instrumentation - I(54214)

Time Duration: 3 Hrs.

Max. Marks: 75

INSTRUCTIONS: 1. All Questions are compulsory.
2. Figures to the right indicate full marks.
3. Assume suitable additional data if required.

- Q.No.1. Attempt any Three of the following:- 3x5=15
- With the help of neat diagrams explain any two mechanical transducers used for measurement of pressure.
 - With the help of a circuitry explain the working of the variable capacitive pressure transducer.
 - What is meant by "Calibration"? Discuss with example "Indirect Calibration" and "Routine Calibration".
 - Discuss the flapper nozzle arrangement and draw its output characteristic. State its application.
 - For a strain gauge, discuss the temperature compensation technique (any One). Also define gauge factor for this transducer.
- Q.No.2. Answer the following:- 6x2=12
- Sketch and explain a complete measuring system for hydraulic jack displacement measurement.
 - List out the various static performance of a system. Discuss any three of such characteristics in details.
- Q.No.3. a) Answer the following:- 5x2=10
- With the help of a circuit diagram, explain the concept of loading effect deriving the minimum condition.
 - Sketch and explain LVDT as a pressure transducer.
- b) Attempt any One of the following:- 2x1=2
- What is 'Electrical Noise'? How is it generated?
 - A measuring system consists of a transducer, an amplifier and a recorder, as per following specifications:-
Transducer sensitivity 0.2 mV/0g
Gain of Amplifier 2.0 V/mV
Recorder sensitivity 5.0 mm/V
Determine overall sensitivity of this measurement system.
- Q.No.4. Answer the following:-
- Compare the variable inductive transducers with respect of change in self-inductance, mutual inductance and eddy current phenomenon. Also ^{explain} any one measurement system using inductive transducers with the help of block diagram & show o/p waveforms at each stage. (08)
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Q.No.4. b) With circuit diagrams justify the need for three wire and four wire methods of a temperature sensor. (04)

Q.No.5. Answer the following:- 2x6=12

- a) Sketch and explain the Bourdon tube pressure gage with digital read out and also, explain the various functional elements of the digital read out pressure gage.
- b) Explain the typical application of a photoconductive transducer for measurement of pressure. Also compare the characteristics of metal resistance and semiconductor resistance temperature transducers.

Q.No.6. Write short notes on any Three of the following:- 4x3=12

- a) Null type instruments over deflection type
- b) Hysteresis and Hysteresis effects
- c) LM, AD series IC sensors
- d) Self heat in thermistor and disadvantages of thermistor.

BOARD OF TECHNICAL EDUCATION

PORVORIM-GOA

May/June, 2009 Examinations

Programme: ELECTRONICS & INSTRUMENTATION ENGINEERING/IS

Course/Subject: BASIC INSTRUMENTATION-I (S-4214)

Time Duration: 3 Hrs.

Max. Marks: 75

INSTRUCTIONS: 1.All Questions are compulsory.
2.Figures to the right indicate full marks.
3.Assume suitable additional data if required.

Q.No.1) Attempt any 3 of the following:- 3x5=15

- a) With the help of the Schematic diagram, explain the dynamic Characteristics of Peizo-electric transducer. Also, draw its equivalent circuit.
- b) List out and discuss any 5 characteristics of an ideal transducer.
- c) With the help of a circuiting explain the working of the variable Capacitive Pressure transducer.
- d) With schematic diagram discuss the contacting type and Non-Contacting type instruments. State its application.
- e) Sketch and explain an application of a photo conductive cell in measurement of pressure.

Q.No.2) Answer the following:- 6x2=12

- a) Sketch and explain the principle and construction & working of an electromagnetic transducers, stating an application
- b) Sketch and explain a complete measuring system for measurement of a Jack displacement.

Q.No.3) a) Ans. the following:- 5x2=10

- 1) State the classification of transducers? Discuss with examples pros & Cons of self generating & power operated transducers.
- ii) Stating the principle of "PT 100" and "Thermiston" compare their Characteristics (minimum 4 items)

b) Attempt any one of the following: 2x1=2

- i) Draw a sketch of a "Capsule" and explain any one application of the same
- ii) Graphically explain the Linearity of a system. Also state how it is expressed.

Q.No.4) Ans. the following:-

- a) With respect to Strain Gauge explain the following with suitable diagram:- (i) Principle (ii) Classification details & construction (iii) Bonding techniques (iv) Compensation technique (8 marks)

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4b) Draw the circuit diagram of a resistance & potentiometer
Also compare wire wound potentiometer over metal film
Potentiometer. (4 marks)

Q.No.5) Ans the following: 2x6=12

- a) With the help of block diagram sketch and explain a typical
Practical example of a temperature measuring system.
- b) Sketch and explain the Bourdon tube pressure gage with digital
read out and also, explain the various functional elements of
the digital read out pressure gauge.

Q.No.6) Write short notes on any 3 of the following:- 4x3=12

- a) Analog type Instruments over Digital type.
- b) Standards and International Standards.
- c) Hysteresis and hysteresis effects.
- d) Four advantages and four limitations of Capacitive transducers.
