BOARD OF TECHNICAL EDUCATION

PORVORIM-GOA

November, 2008 Examinations

Programme: Instrumentations & Control

Course/Subject: Basic Instrumentation (4214) [MPEES]

Time Duration: 3 Hrs. Max. Marks: 100

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

1) Answer any 5. 4x5=20

a) Define instrumentation. What are the objectives of measurement?

b) Stating examples, Compare:
I) null and deflecting type instruments.
II) analog and digital type instruments

c) With the help of numerical example, clearly Explain the terms 'accuracy' and 'Precision'.

d) What are the various types of errors in measurement Systems? classify them, with examples.

e) Explain, with one example each:
i)Analog and digital transducers
ii)electromechanical transducer
iii)optoelectrical transducer

f) In a bridge, Compare
i)null and deflection type
ii)a c and d c excitation type

g) Classify various data presentation elements, with examples.

Q.No.2. Answer any 2. 2x8=16

a) Explain basic building blocks of a measurement system. Describe the Function of each.

b) Explain the classification of instruments as:
i) Manually Operated and automatic types
ii)Contacting and non-contacting types

c) Expalain two typical applications of a measurement system. what is Calibration? Explain direct and indirect calibration.

Q.No.3. Answer any 2. 2x8=16

a) Explain any 4 static performance characteristics in a measurement system

b) Explain the response of First and Second order systems to a step input. What are the important frequency response Specifications?

c) Write a note on shielding, grounding and Coupling techniques

Q.No.4. Answer any 2. 2x8=16

a) Explain basic principle, typical characteristics, materials used in:
i) Variable resistance transducers
ii) Mutual inductance type transducers

...2/-

Q.No.4. b) Write notes on: i)Photovoltaic transducer
ii)Electromagnetic transducer.

c) Explain in detail:
i)Cantilever
ii)Bellows
iii)Flapper-Nozzle

Q.No.5. Answer any 2. 2x8=16

a) What is meant by signal conditioning? How are signal conditioning elements classified?
What is the purpose of Filter? Sketch Frequency response of Low Pass, high Pass. band pass and band stop Filter

b) Explain basic concept. input - output relationship and typical Specifications of:
i) Hydraulic type mechanical amplifier
ii) Integrator
iii) Buffer amplifier

c) Explain basic concept, input-output relationship and typical Specifications Of:
i) V to F Converter
ii) Charge amplifier
iii) Digital to Analog Converter

Q.No.6. Answer any 2. 2x8=16

a) Explain the construction, working and typical specifications of
i) Pen recorders
ii) X - X Plotters.

b) Write notes on: i) C R O
ii) Mechanical Pointers.

c) Explain typical measurement system application involving temperature measurement.

****

BOARD OF TECHNICAL EDUCATION

PORVORIM-GOA

May/June, 2009 Examinations

Programme: INSTRUMENTATION & CONTROL

Course/Subject: BASIC INSTRUMENTATION (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.

1) Answer the following:-(any five) 3x5=15

a) With examples, explain classification of instruments as:

i) null and deflection type

Compare their features (two points).

b) Classify the various errors that can affect on instrumentation System, with examples.

c) Explain any one Mechanical transducers with respect to its characteristics material used and principle.

d) Explain classification of transducers, with examples.

e) Explain basic concept, input/output relationship and typical Specifications of hydraulic amplifier

f) Explain block diagram and typical specifications of Ultra Violet Recorders.

Q.No.2. Answer any two. 2x6=12

a) Define instrumentation. what are the objectives of measurement? Explain basic building blocks of a measurement system.

b) Explain the classification and compare instruments as:

i) Self generated and power operated

ii) Manual and automatic operation

c) Explain typical applications of measurement systems (any two) What is meant by direct and indirect calibration?

Q.No.3. Answer any two. 2x6=12

a) Explain any three important static performance characteristics of a measurement system, stating their significance

b) Explain the response of first and second order systems to a step input. What are the important frequency response specifications.

c) Write a note on shielding, grounding and coupling techniques.

Q.No.4. Answer any 2. 2x6=12

a) Explain the basic principle, typical input/output characteristic type of material used and measurement technique used in:

Inductive type transducer

b) Write notes on: i) Photovoltaic transducer (ii) Thermoelectric transducer.

c) Write notes on: i) Bourdon tube (ii) Bellows.

Cont...

Q.No.5. Ans any 2. 2x6=12

a) Explainsignal conditioning need. How are signal conditioning elements classified?

b) Write notes on: i) Buffer amplifier (ii) Charge amplifier

c) Write notes on :i) V to F Converter.

ii) Filters and their types.

Q.No.6. Ans. any 2. 2x6=12

a) Explain the construction, working and typical Specifications of : i) Magnetic tape recorder

ii) X - Y Plotter

b) Write notes on : i) Mechanical Pointers

ii) Servo recorders.

c) Explain typical measurement system application involving displacement measurement.

****