

Printed Pages : 3



NEE4J3

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 121411

Roll No.

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B. Tech.

(SEM. IV) THEORY EXAMINATION, 2014-15
INSTRUMENTATION & PROCESS CONTROL

Time : 2 Hours]

[Total Marks : 50

Note : Attempt all questions.

1 Attempt any four questions :

4×3=12

- (a) Define an instrumentation system with suitable block diagrams.
- (b) What is the load cell, what for it used ?
- (c) What is primary sensing element and why is it important ?
- (d) Describe a method for the measurement of flow.
- (e) A quartz piezoelectric crystal having a thickness of 2mm and voltage sensitivity of 0.055 Vm/N is subjected to a pressure of 1.5 M N/m². Calculate the voltage output if the permittivity of quartz is 40.6×10^{-12} F/m, calculate its charges sensitivity.
- (f) Explain digital transducer. Why are these preferred over analog transducer.

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2	Attempt any four questions : (a) What is the piezo-resistive gauges and derive the expression for gauges factor. (b) Explain the Piezo-electric transducers and derive the expression for output voltage. (c) Describe the working of resistance Thermometer. (d) Explain the measurement of low pressure using diaphragm with the help of diagram. (e) The LVDT with secondary voltage 5 Volt has a range of ± 100 mm. Find (i) Output voltage when core is -7.5 mm from centre. (ii) Plot the o/p voltage core position for core movement from $+7.5$ mm to -40 mm. (f) Describe various electrical methods used for measurement of liquid level.	4×3=12	4	Attempt any two questions : (a) Describe the basic components of magnetic tape recorder and application using direct techniques. (b) Explain x-y recorder and strip chart recorder. (c) What is process control ? Explain with a suitable example. Also explain the three term control action (PID).	2×7=14
3	Attempt any two questions : (a) Define telemetry. Explain need of data transmission and telemetry. (b) What is data acquisition system ? With suitable diagram explain digital data acquisition system. (c) Define time division multiplexing and frequency division multiplexing as applied to telemetry.	2×6=12	3		[6275]

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