B. Tech.

(SEM. VI) EXAMINATION, 2006-07

INSTRUMENTATION & AUTOMATIC CONTROL

Time : 2 Hours] [Total Marks : 50

Note : Attempt all questions.

1. Attempt any four parts of the following : 3.5x4
   (a) State the difference between accuracy and precision of a measurement.
   (b) Define the dynamic response of a system and distinguish between steady state response and transient response.
   (c) Explain the principle of Resistance temperature detector (RTD)
   (d) Describe the principle of working and application of Piezo-electric transducer.
   (e) Compare a magnetic flowmeter with a turbine flowmeter.
   (f) List four types of electric pressure transducers and describe the application of each type.

2. Attempt any four parts of the following : 3.5x4
   (a) What is an instrumentation amplifier ?
   (b) What is the difference between a strip chart recorder and an x-y recorder ?

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(c) Explain the working principle of inverting OP AMP amplifier circuit.
(d) List the factors governing selection of a transducer for a particular measurement.
(e) Explain how a capacitive transducer may be used for the measurement of pressure.
(f) What kind of transducers are required for the measurement of texture of fabric?

3. Attempt any two parts of the following: 5.5x2
(a) Explain the principle of numerical control. Show schematically the open loop and closed loop numerical control systems.
(b) What is the advantage of linear transducer for feedback measuring? Explain the working of linear optical encoder.
(c) What is the most popular type of drive for CNC machines today and why? List the advantages of servomotors with built-in encoders.

4. Attempt any two parts of the following: 5.5x2
(a) Explain the concept of ‘floting datum’ and ‘set point’ with reference to CNC part programming. What is their relationship? Explain how they are used in programming in ISO format.
(b) Write and explain the standard format for GO1 and GO2 code in a CNC lathe.
(c) What do you understand by the word canned cycle in a manual part programming? Explain with neat sketches the difference between the operation of the canned cycles G81 and G83.