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**4th Sem. / Elect. Engg.**

**Subject : Instrumentation**

Time : 3 Hrs.

M.M. : 100

### SECTION-A

**Note:**Very Short Answer type questions. Attempt any 15 parts. (15x2=30)

- Q.1
- a) Define Transducer.
  - b) Define analog transducers with one example.
  - c) Define strain gauge.
  - d) Expands LVDT.
  - e) Name any two methods of displacement measurement.
  - f) Define Potentiometer.
  - g) What is load cell?
  - h) Define gauge factor.
  - i) What is inverse transducer?

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- j) Electromagnetic flowmeters works on the principle of \_\_\_\_\_.
- k) Write the pH value scale and pH value of pure water.
- l) Write the basic principle of Bimetallic thermometer.
- m) RTD is a linear or non-linear thermometer.
- n) Define Humidity.
- o) Define Measurand.
- p) Define Hygrometer.
- q) Write one metals combination used for thermocouple.
- r) Write two display devices.

### SECTION-B

**Note:**Short answer type questions. Attempt any ten parts 10x4=40

- Q.2
- i) Explain Briefly the elements of general measurement system.

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- ii) Explain different methods of measurement.
- iii) Differentiate between active and passive transducer with suitable example.
- iv) Write the advantages of electrical transducers..
- v) Explain the basic principles of inductive transducers.
- vi) Explain briefly any one type of strain gauge.
- vii) List the different methods of speed measurement.
- viii) List the different methods of force measurement.
- ix) Write short notes on thermocouple.
- x) Explain pressure measurement by using pirani gauge.
- xi) What are Thermistors? Give its application also.
- xii) Explain electronic pH measurement.
- xiii) Explain any one electrical method of level measurement.

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- xiv) Briefly explain strain gauge load cell.
- xv) Explain piezoelectric type transducers.

### SECTION-C

**Note:** Long answer type questions. Attempt any three questions. 3x10=30

- Q.3 Explain the construction and principle of working of an L.V.D.T.
- Q.4 Describe the various methods for torque measurement.
- Q.5 Explain ultrasonic flowmeter in detail and also write its advantages.
- Q.6 What is relative humidity? Explain different types of hygrometer.
- Q.7 What is pyrometer. Describe the different pyrometer used.

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