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Total No. of Pages: 02
Total No. of Questions: 09

B.Tech. (IE, ME) (Sem.-5th)
MECHANICAL MEASUREMENT AND METROLOGY
Subject Code: ME-307
Paper ID: [A0817]

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATE:

1. *Section-A is compulsory.*
2. *Attempt any four questions from Section-B.*
3. *Attempt any two questions from Section-C.*

SECTION-A

(10x2=20)

Q1. Write briefly:

- a) List two advantages of electronic instruments over mechanical instruments.
- b) Differentiate between accuracy and precision.
- c) What do you mean by the order of a measurement system?
- d) What are the random errors in the act of measurement?
- e) List the instruments that can be used for angular measurements.
- f) What is the gauge factor of a strain gauge?
- g) What is the purpose of a hot wire anemometer?
- h) What is a total radiation pyrometer?
- i) What is the working principle of a proving ring?
- j) How is the working of a resistance thermometer different than a thermistor.

SECTION-B

(4x5=20)

- Q2. With the help of an example explain about the various functional elements of a measurement system.
- Q3. What are the different sources of error in measurement? Explain.
- Q4. Define the terms: Speed of response, lag, dynamic error, dead time and dead zone.
- Q5. Explain the working of a sine bar.
- Q6. What is temperature compensation in strain gauges. Why is it needed? Explain.

SECTION-C

(2x10=20)

- Q7. State the objectives of flow visualization. Explain some of the methods commonly adopted for flow visualization.
- Q8. What is a transducer. Discuss the different types of transducers and state the various quantities which can be measured using them.
- Q9. Write short notes on the following:
- i) Stroboscope.
 - ii) Ultrasonic flow meter.

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