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

B.Tech (ME) (Sem.-5th)
MECHANICAL MEASUREMENT AND METROLOGY
Subject Code: BTME-503
Paper ID: [A2130]

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATE:

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

SECTION-A

(10x2=20)

Q1. Write briefly:

- a) List the basic functional elements of a measurement system.
- b) What is a working standard.
- c) Differentiate between step input, ramp input and sinusoidal input.
- d) Define error. How can errors be classified.
- e) List the instruments that can be used for angular measurements.
- f) What is the importance of gauge factor in the design of strain gauges.
- g) What is the purpose of a hot wire anemometer.
- h) What is the working principle of a thermocouple.
- i) What are the advantages of using an inclined tube manometer as compared to U-tube manometer.
- j) Differentiate between absorption and transmission dynamometer.

Section-B

(4x5=20)

- Q2. With the help of examples explain primary, secondary and tertiary measurements.
- Q3. Measurement systems are classified frequently as first order or second order system. Explain.
- Q4. Explain the importance of statistical analysis of the test data in measurements.

- Q5. State the objectives of flow visualisation. Explain some of the methods commonly adopted for flow visualization.
- Q6. Explain a method to measure torque of a rotating shaft.

Section-C

(2x10=20)

- Q7. What is a transducer. Discuss the different types of transducers and state the various quantities which can be measured using them.
- Q8. What is temperature compensation in strain gauges. Why is it needed. Explain.
- Q9. Write short notes on any two of the following:
- (i) Use of sine bar for angular measurement.
 - (ii) Measurement of flatness by interferometry.

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