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Roll No.			Total No. of Pages: 02

Total No. of Questions: 09

B.Tech.(ME) (2011 Onwards) (Sem.-5)
MECHANICAL MEASUREMENT AND METROLOGY

Subject Code: BTME-503 Paper ID: [A2130]

Time: 3 Hrs. Max. Marks: 60

#### **INSTRUCTION TO CANDIDATES:**

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

### **SECTION-A**

### l. Write short notes on:

- a) Define the terms 'Fidelity and Speed of Response'.
- b) Name the various functional elements of a Bourdon tube with the help of block diagram.
- c) What are piezo-electric transducers?
- d) Differentiate between first order and second order systems.
- e) Write a brief note on flow visualization techniques.
- f) What is the principle of stroboscope?
- g) State the important generalized elements of measurement.
- h) Give the method of vacuum measurement.
- i) Why dummy strain gauges are used?
- j) What is the order of the thickness of oil film at the surface of slip gauge?

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### **SECTION-B**

- 2. Elaborate the working of a Linear Variable Differential Transformer for measurement of displacement.
- 3. Discuss the application of strain gauges for the measurement of torque.
- 4. Explain the different methods of measuring force. Explain the working of Proving ring and Mechanical Load cell in brief.
- 5. Explain in detail how a sine bar is used for angle measurement.
- 6. State different types of errors which can occur during the process of measurement. Discuss the methods to reduce/ remove such errors.

# **SECTION-C**

- 7. (a) Explain with the help of a neat sketch the working of a electromagnetic flux meter.
  - (b) Discuss the application of optical pyrometer for temperature measurement.
- 8. (a) Explain the difference between a comparator and a measuring instrument. State the field of application of comparators.
  - (b) Compare the relative advantages and disadvantages of mechanical and electrical instruments.
- 9. What are dynamometers? How are they classified? Explain the difference between absorption, transmission and driving dynamometers.

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