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

**I. 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?

## 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.