Roll No. | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 09

B.Tech.(IE) (ALL)/(ME) (Sem.–5)

MECHANICAL MEASUREMENT AND METROLOGY

Subject Code : ME-307

Paper ID : [A0817]

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

1. Write short notes on :

(a) Explain briefly the importance of measurements and instruments.

(b) Distinguish between range and span with a sketch.

(c) Define systematic errors with examples.

(d) What do you mean by Surface Roughness? Give its units.

(e) State the principle of a Piezoelectric Transducer.

(f) Name the instruments used for vacuum measurement.

(g) What is the principle and applications of a proving ring?

(h) Name any two types of load cells and give their applications.

(i) Distinguish between bonded and unbounded gauges.

(j) How you can measure major and minor diameter of internal threads?

SECTION-B

2. Explain basic and auxiliary functional elements of a measurement system in detail.

3. Describe the different types of errors in measurement and their causes.

4. Describe with a neat sketch the measurement of pitch of internal and external screw threads.

5. Explain the application of strain gauges for direct, bending and torsional loads.

6. Explain the working of a vibration reed tachometer with a neat sketch.

SECTION-C

7. (a) Describe in detail zero, first and second order systems and their response to various input signals.

   (b) Explain the working of a sine bar with a neat sketch.

8. (a) Explain the working of a hot wire anemometer.

   (b) What do you mean by temperature measurement? Explain liquid-in-glass thermometer with a neat sketch.

9. Write short notes on **any two** of the following :

   (a) Resistance strain gauges

   (b) Design and planning of experiments

   (c) Optical pyrometer