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Total No. of Pages : 2

Total No. of Questions : 09

B.Tech. (IE/ME) (Sem.-5)

MECHANICAL MEASUREMENT AND METROLOGY

Subject Code : ME-307 (All Batches)

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 briefly :

- a) What do you understand by standards in mechanical measurements?
- b) Define range and span of the instrument.
- c) Define hysteresis.
- d) What is meant by calibration? Why is it done for measuring systems?
- e) Differentiate systematic and random errors.
- f) Explain the difference between roughness and waviness.
- g) What is Mcleod guage?
- h) What do you mean by load cell?
- i) Explain flatness and straightness.
- j) What is a thermocouple?

SECTION-B

2. What do you mean by error in measurement? Discuss the various sources of errors.
3. Explain zero, first and second order measuring instruments.
4. Differentiate between a comparator and measuring instruments.
5. What is a dynamometer? Explain the various types of dynamometers.
6. What is a sine bar and how it is used for angle measurement?

SECTION-C

7. (a) Explain the construction and working of a Bourdon tube pressure gauge with a neat sketch.
(b) Describe the principle of operation of a piezo-electric transducer. List their advantages, disadvantages and applications.
8. (a) Describe working principle of a stroboscope with neat sketch.
(b) Explain the working principle of Talysurf surface roughness instrument with neat sketch.
9. Write notes on :
 - (a) Design of experiments
 - (b) Ultrasonic flow meter.