

**B. TECH.**  
**THEORY EXAMINATION (SEM-IV) 2016-17**  
**MEASUREMENT AND METROLOGY**

*Time : 3 Hours*

*Max. Marks : 100*

*Note : Be precise in your answer. In case of numerical problem assume data wherever not provided.*

**SECTION – A**

1. **Attempt all parts of the following questions:** **10 x 2 = 20**
- (a) What is meant by static response?
  - (b) Define interchangeability.
  - (c) Mention any four precautions to be taken while using slip gauges.
  - (d) What is progressive error in screw gauge?
  - (e) Define limit and tolerance.
  - (f) Name any four instruments used for temperature measurement.
  - (g) Distinguish between force and torque.
  - (h) What is comparator?
  - (i) Define straightness.
  - (j) What are the chances of errors using sine bars?

**SECTION – B**

2. **Attempt any five of the following questions:** **5 x 10 = 50**
- (a) Give the structure of generalized measuring system and explain it in detail.
  - (b) Explain in detail various types of errors that may arise in engineering measurements.
  - (c) Explain with a neat sketch the construction and working of sigma comparator.
  - (d) Explain the working principle of AC laser interferometer and explain how the straightness is measured?
  - (e) Explain how V-Block and three point probe are used for measurement of roundness. What are the limitations of V-Block?
  - (f) Describe with neat sketch the measurement of pitch of internal and external threads using a pitch measuring machine
  - (g) With a sketch explain the displacement measurement using Linear Variable Differential Transformer (LVDT)
  - (h) Explain the Taylor's principle of gauge design. Define ring gauge and plug gauge.

**SECTION – C**

**Attempt any two of the following questions:** **2 x 15 = 30**

- 3 Describe with neat sketches:
- (i) Thermocouples
  - (ii) Strain gauge torque meter
- 4 Describe the followings in connection with pressure measurement:
- (i) Piezo-electric pressure transducer.
  - (ii) Variable capacitance transducer.
- 5
- (i) Explain with a neat sketch how a vernier caliper is used for linear measurements.
  - (ii) Why is sine bar not suitable for measuring angle above  $15^{\circ}$ .