

P P SAVANI UNIVERSITY
Fourth Semester of B. Tech. Examination
Nov-Dec 2021

SEME2070 Mechanical Measurement & Metrology

14.12.2021, Tuesday

Time: 12:30 p.m. To 03:00 p.m.

Maximum Marks: 60

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION-I

Q - 1 What is measurement error? Classify errors and explain any one in short. **[05]**

Q - 2 (a) Differentiate following terms: **[05]**
i. Accuracy and precision
ii. Threshold and resolution
iii. Hysteresis and dead Zone

Q - 2 (b) Distinguish between Primary, Secondary, Tertiary and working standards of length. **[05]**

OR

Q - 2 (a) Enlist errors in thread measurement and sketch the gear tooth vernier calliper. **[05]**

Q - 2 (b) Differentiate between following: **[05]**
(1) Threshold and Resolution
(2) Accuracy and Precision

Q - 3 (a) Explain the construction and working of the following with neat sketch. **[05]**
(i) Telescopic gauge (ii) Universal bevel protractor .

Q - 3 (b) What do you mean by Ra and Rz values? Give illustration. **[05]**

OR

Q - 3 (a) Explain the construction and working of Toolmaker's Microscope. **[05]**

Q - 3 (b) Explain Profilometer with neat sketch. **[05]**

Q - 4 Explain the construction and working of LVDT with its advantage and disadvantages. **[05]**

SECTION-II

Q - 1 In a vernier calliper, the main scale reads in millimetres with a least count of 0.5 mm. Twenty divisions on the vernier correspond to 19 divisions on the main scale. Determine the least count of the calliper. **[05]**

Q - 2 (a) What is measurement error? Classify errors and explain any one in detail. **[05]**

Q - 2 (b) Explain proving ring with sketch. **[05]**

OR

Q - 2 (a) Define accuracy and precision. **[05]**

Q - 2 (b) Enlist methods of measurements. Explain Slip gauges with wringing process. **[05]**

Q - 3 (a) Discuss the gear tooth terminology with neat sketch. **[05]**

Q - 3 (b) Explain the principle of thermo couple. Also explain their calibration Method. **[05]**

OR

Q - 3 (a) State the types of Coordinate Measuring Machines. Explain any one in brief. **[05]**

Q - 3 (b) Sketch and describe the construction and working of Tomlinson surface roughness tester. **[05]**

Q - 4 Attempt any one. **[05]**

(i) List source of errors in filled system thermometers and explain any one.

(ii) Explain Role of computer in field of Metrology.
