

ASSIGNMENT – 1 MECHANICAL MEASUREMENT & METROLOGY

1. State and explain five basic elements of measuring system
2. Describe with net sketch International prototype meter (Material length standard) stating material composition and limitation
3. Differential line standard and end standard
4. Explain various types of Errors in measurement and state how they can take care of.

ASSIGNMENT – 2 LINEAR & ANGULAR MEASUREMENT

1. Explain construction , working and principle of following:
 - a. Vernier caliper
 - b. Vernier depth gauge
 - c. Vernier height gauge
 - d. Telescopic gauge
 - e. Combination square set
 - f. Slip gauge
 - g. Sigma comparator
 - h. Johansson mikrokator
 - i. Dial indicator
2. Explain with sketch the construction and working of micrometer. Explain how least count is found and reading is taken. What is zero error?
3. Explain construction , working and principle of following:
 - a. Vernier bevel protractor
 - b. Angle gauge
 - c. Angle dekkor
 - d. Sine bar and sine Centre
 - e. Autocollimator
 - f. Clinometers

ASSIGNMENT – 3 Measurement of Force, Torque and strain

1. Explain different types of load cell.
 2. Explain absorption dynamometers.
 3. Explain Mechanical strain gauge.
 4. Explain bridge arrangement.
 5. Explain gauge factor.
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ASSIGNMENT – 4 Velocity and acceleration measurement

1. Explain working principle of Resistive potentiometer.
2. Explain Linear variable differential transducer.
3. Explain electric and photoelectric tachometers.
4. Explain piezoelectric Accelerometer.

ASSIGNMENT – 5 Temperature measurement

1. Explain the construction and working of a resistance thermometer and thermocouple with a neat sketch.
2. Compare advantages of thermocouple and thermistors.
3. Explain filled system thermometers.
4. Explain radiation and optical pyrometer.
5. List and explain with neat sketch types of expansion thermometer stating applications

ASSIGNMENT – 6 Gear and screw thread measurement

1. Explain with neat sketch three wire method of measuring effective diameter of screw thread.
2. What is an effective diameter of threads? State its significance. Explain with sketch Measurement of effective diameter by two wire method stating limitation.
3. Calculate the chord length and its distance below the tooth tip for gear of module 4 and 20 degree pressure angle.
4. Explain Parkinson gear tester with neat sketch.
5. Describe with sketch the construction and use of gear tooth vernier caliper. How is the gear tooth thickness at PCD measured?

ASSIGNMENT – 7 Measurement Of Surface Finish

1. Explain Surface Texture and Elements of surface Roughness.
2. With the help of a neat sketch explain the working of Tomlinson's surface meter and Profilometer.
3. Explain alignment test for lathe machine.
4. Explain following terms used in surface finish:
 - a. Roughness
 - b. Waviness

c. Effective profile e. Lay d. Center of profile

ASSIGNMENT – 8 Miscellaneous Measurement

1. Explain precision instrumentation based on laser principle.
 2. Explain Optical measuring techniques.
 3. Explain Tool makers microscope.
 4. Explain profile projector.
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