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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech III Year II Semester Regular Examinations August-2022

METROLOGY & MEASUREMENTS

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- 1 a Define Maximum, Minimum Metal limits and Maximum, Minimum clearances with the help of neat sketches. L1 6M
- b Between two mating parts of 100 mm basic size, the actual interference fit is to be from 0.05mm to 0.12mm. The tolerance for hole is the same as the tolerance for the shaft. solve the size of the shaft and the hole on (i) hole basis unilateral system (ii) Shaft basis unilateral system L3 6M

OR

- 2 a Distinguish between the GO and NO-GO gauges L2 6M
- b What is Taylor's principle of gauge design? L1 6M

UNIT-II

- 3 a What are clinometers? Explain Vernier clinometers. L2 6M
- b Calculate the angle of taper and minimum diameter of an internal taper from the following reading: L3 6M
Diameter of bigger ball = 10.25 mm
Diameter of smaller ball = 6.07
Height of top of bigger ball from datum = 30.13 mm
Height of top of smaller ball from datum = 10.08 mm

OR

- 4 a How can you measure angle? List the angular measuring instruments. L1 6M
- b Discuss about the sources of error in sine bars. L2 6M

UNIT-III

- 5 a Discuss the principal reasons for controlling the surface texture. L2 6M
- b Express the following methods of qualifying surface roughness: L2 6M
(i) RMS value. (ii) Rz value.

OR

- 6 a Describe measurement of pitch by base Tangent method. L2 6M
- b Elaborate method of measuring the gear tooth thickness by Constant Chord method L2 6M

UNIT-IV

- 7 a Define transducer? List and explain two important and closely related parts L1 6M
- b Classify transducers? Discuss active and passive transducers with examples L2 6M

OR

- 8 a List the essential characteristics required for the backing material of a bonded strain gauge. L1 6M
- b Elaborate Rectangular strain gauge rosette. L2 6M

UNIT-V

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| 9 a | Define manometer? Elaborate the U- tube Manometer in detail | L1 | 6M |
| b | What is formula for dead weight tester? Discuss the Dead Weight gauge in detail. | L1 | 6M |

OR

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| 10 a | What are the basic methods of force measurement? Elaborate elastic force devices with neat sketch. | L2 | 6M |
| b | Sketch a Mcleod gauge and explain working principle. | L2 | 6M |

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