

CBCS SCHEME

17AE36

USN

Date

Third Semester B.E. Degree Examination, July/August 2021 Measurement and Metrology

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Define standard and illustrate sub division standards. (10 Marks)
b. List the slips to be wrong together to produce an overall dimension given below using M112 set of gauges. Also use two protection slips of 2.5mm size. Show the slip gauges combination i) 92.357mm ii) 35.4875mm. (10 Marks)
- 2 a. Explain NPL method of deriving end standard from line standard. (10 Marks)
b. Three 100mm end bars are measured on a level comparator by first wringing then together and comparing with a 300mm bar. The 300mm bar has a know error of $+40\mu\text{m}$ and the three bars together measure $64\mu\text{m}$ less than the 300mm bar. Bar A is $18\mu\text{m}$ longer than bar B and $23\mu\text{m}$ longer then bar C. Find the actual length of each bar. (10 Marks)
- 3 a. Explain with neat sketch compound tolerance and tolerance accumulation. (10 Marks)
b. Explain Interchangeability and Selective assembly. (10 Marks)
- 4 a. Explain Unilateral and Bilateral tolerance. (10 Marks)
b. Explain Hole basis and shaft basis system. (10 Marks)
- 5 a. Describe Sigma comparator with neat sketch and mention the advantages and disadvantages of mechanical comparator. (10 Marks)
b. Describe Vernier Bevel protractor with neat sketch. (10 Marks)
- 6 a. Describe 3-wire method of measuring effective diameter of threads. (10 Marks)
b. Select the sizes of angle gauges required to build the following angles, also sketch the arrangement of gauges
i) $102^\circ 8' 42''$ ii) $35^\circ 32' 36''$ iii) $37^\circ 9' 18''$ iv) $57^\circ 34' 9''$ (10 Marks)
- 7 a. Explain and state the significance of following terms in measurement
i) Accuracy ii) Threshold iii) Precise iv) Loading effect v) Repeatability. (10 Marks)
b. Define Transducer. With neat sketch explain Torsion bar and Proving ring. (10 Marks)
- 8 a. Explain with sketch three coil type variable mutual inductance transducer. Also list its applications. (10 Marks)
b. Explain with sketch the construction and working of an ionization transducer. Also its application. (10 Marks)
- 9 a. Explain the construction and working of optical pyrometer with neat sketch. (10 Marks)
b. Describe with a neat sketch of McLeod vacuum gauge and explain its working principle. (10 Marks)
- 10 a. Illustrate the following with neat sketch i) Prony Brake Dynamometer ii) Hydraulic Dynamometer. (10 Marks)
b. Explain the analytical balance with neat sketch. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. $42+8=50$, will be treated as malpractice.