



CBCS SCHEME

18AE36

Third Semester B.E. Degree Examination, June/July 2023 Measurements and Metrology

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define calibration and explain procedure for calibration of end bar. (08 Marks)
- b. Describe with neat sketch Imperial Standard Yard (06 Marks)
- c. Define following :
 - i) Standard
 - ii) Error (06 Marks)

OR

- 2 a. Write a note on Slip gauges. (06 Marks)
- b. Build a dimension of 35.4875mm using M112 set. Use two protector slips of 2.5mm each. (08 Marks)
- c. Discuss the following standards of measurement:
 - i) Line standard
 - ii) Wavelength standard
 - iii) End standard (06 Marks)

Module-2

- 3 a. Explain Taylor's principle for the design of limit gauges. (10 Marks)
- b. Determine the dimensions of the shaft and hole for a fit $30 H_8/d_{10}$ and sketch the fit, given the following data:
 - i) Determine 30 falls in the diameter range 18 – 30, upper deviation for 'd' shaft is $-16D^{0.44}$
 - ii) $i = 0.45D^{1/3} + 0.001D$. Tolerance for $IT_8 = 25i$, Tolerance for $IT_{10} = 64i$. (10 Marks)

OR

- 4 a. Differentiate between hole basis system and shaft basis system with sketches. (10 Marks)
- b. Explain the following :
 - i) Clearance fit
 - ii) Interference fit. (10 Marks)

Module-3

- 5 a. Explain with sketch dial indicator. (10 Marks)
- b. Explain the principle of working with a sketch :
 - i) Angle gauges
 - ii) Bevel protractor. (10 Marks)

OR

- 6 a. With neat sketch show all the terminologies of a spur gear. (10 Marks)
- b. Derive an expression for the best wire size used in the 2/3 wire method. (10 Marks)

Module-4

- 7 a. Describe the 3 stages of measurement with a suitable example. (10 Marks)
- b. With a sketch explain piezoelectric transducer. (10 Marks)

OR

- 8 a. Define transducer. Explain with sketch Mechanical Transducer. (10 Marks)
- b. Explain resistive type transducer used to measure angular measurement. (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.

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Module-5

- 9 a. Explain with neat sketch the platform balance.
b. Write a note on electrical resistance strain gauges.

(10 Marks)

(10 Marks)

OR

- 10 a. State and explain the laws of thermocouple.
b. With neat sketch explain electric dynamometer.

(10 Marks)

(10 Marks)

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