



Regulation R18

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

Subject code: 2E5CB

B.Tech V Semester Supplementary Examinations, January 2023

ENGINEERING METROLOGY

(Mechanical Engineering)

Maximum Marks: 70

23-01-2023

Duration: 3 Hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 Differentiate between systematic and random errors.
- 2 List out any five methods of measurement.
- 3 How is a scale different from a rule?
- 4 Write a note on the types of micrometers.
- 5 What are material standards? List their disadvantages.
- 6 Write a note on wavelength standards.
- 7 How are standards subdivided?
- 8 Write the characteristics of line and end standards.
- 9 Write the major applications of CMMs.
- 10 What is the need for acceptance tests?

Part-B

Answer All the following questions

(10MX 5=50Marks)

- 11 Distinguish between primary, secondary, tertiary, and working standards. [10]
OR
- 12 List the important considerations for the design of linear measurement instruments. [10]
- 13 Describe with a sketch the principle behind the working of an autocollimator. [10]
OR
- 14 Give the classification of comparators. [10]
- 15 Write a note on the various contact points used in a dial indicator. [10]
OR
- 16 Distinguish between progressive pitch error and periodic pitch error. [10]
- 17 Determine the effective diameter of a metric screw using the three-wire method. The following data is available: diameter of the best size wire = 0.740 mm, distance over the wires = 25.58 mm, and pitch = 1.25 mm. [10]
OR
- 18 Differentiate between two- and three-wire methods. [10]

- 19 Tolerances for a hole and shaft assembly having a nominal size of 50 mm are as follows: [10]

$$\text{Hole} = 50^{+0.02}_{+0.00} \text{ mm and shaft} = 50^{-0.05}_{-0.08} \text{ mm}$$

Determine the following:

- a) Maximum and minimum clearances
- b) Tolerances on shaft and hole
- c) Allowance
- d) MML of hole and shaft
- e) Type of fit

OR

- 20 Briefly discuss the three basic types of commands in programming of CMMs. [10]