



R18 Regulation

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

Subject code: 2E5CB

B.Tech V Semester Regular/Supplementary Examinations, December 2021
ENGINEERING METROLOGY
(Mechanical Engineering)

Maximum Marks: 70

Date: 10.02.2022 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 which carries 10M.
 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 Write the differences between the unilateral and bilateral system.
- 2 How are tolerances specified and indicated?
- 3 State the principle of micrometer.
- 4 Why are sine bars not used for measuring larger angles?
- 5 Monochromatic light is used in interferometer and not white light. Why?
- 6 Mention the limitations of Tool maker's microscope.
- 7 Define the terms roughness and waviness.
- 8 Mention the factors affecting surface finish of a machined component.
- 9 Give the classification of CMMs.
- 10 Distinguish between alignment tests and performance tests on machine tools.

Part-B

Answer All the following questions. (5X10M=50Marks)

- 11 (a) Determine limit dimensions for a clearance fit between mating parts of diameter 40 mm, providing a minimum clearance of 0.10 mm with a tolerance on the hole equal to 0.025mm and on shaft 0.05 mm using both systems. (6 marks)
(b) Name and sketch the three main types of fits. (4 marks)

OR

- 12 (a) Differentiate between shaft based and hole based systems. (4 marks)
(b) Differentiate between interchangeable assembly and selective assembly, with suitable examples. (6 marks)

- 13 Explain the construction, working principle and applications of sine bar. (10 marks)

OR

- 14 Mention the materials used for the manufacture of GO and NO GO gauges. Explain the disposition of tolerance on GO and NO GO gauges by taking reference to work tolerances. (10 marks)

- 15 (a) List the different types of Interferometers. (2 marks)
(b) Explain the working principle of optical projector with a neat sketch. (8 marks)

OR

- 16 With a sketch, explain the construction of an autocollimator. What are its applications? (10 marks)

17 Explain the working of Tomlinson surface finish tester with a neat sketch. (10 marks)

OR

18 How surface texture is related to tolerances on surface dimensions? Discuss the measure of surface roughness recommended by ISO. (10 marks)

19 Describe with neat sketches, two wire method of measuring the effective diameter of screw threads. (10 marks)

OR

20 Explain the various alignment tests performed on a lathe with suitable sketches. (10 marks)