

Reg No :

Name :



MAR ATHANASIOUS COLLEGE OF ENGINEERING, KOTHAMANGALAM

(Govt. Aided Autonomous Institution)

Fourth Semester B.Tech. Degree Examination, May, 2026

Course Code: B24ME2T05

Course Name: METROLOGY AND MACHINE TOOLS

Max. Marks: 100

Duration:3 Hours

PART - A: 30 Marks (10 Qns x 3 Marks)

Answer all questions

1. List the forces acting on a cutting tool during machining.
2. What is rake angle? State its function.
3. Explain the method of holding work between centres
4. Differentiate between counterboring and countersinking
5. State the working principle of cylindrical grinding.
6. Define face milling.
7. Suggest practical steps to minimize random errors during measurement in a workshop.
8. Define Taylor's principle of gauging.
9. Describe the main functions of a machine vision system.
10. Explain the importance of pitch circle in gear measurement.

PART - B: 70 Marks (5 Qns x 14 Marks)

Answer any One full question from each module.

Module 1

11. Discuss the formation of built-up edge (BUE), its causes, effects, and methods to prevent it.

OR

12. Explain the mechanisms of tool wear in metal cutting. Discuss flank wear, crater wear, and built-up edge, including causes, effects, and preventive measures.

Module 2

13. Describe the crank and slotted link mechanism in shaper and explain its working.

OR

14. Explain the working principle of a planer and discuss its main components and their functions.

Module 3

15. Explain the working principle of grinding wheel and the mechanism of material removal in grinding.

OR

16. Explain the construction and working of an indexing head with neat sketch

Module 4

17. a. Explain the working principle of a Vernier caliper. (6 marks)
b. Explain the construction and working of Taylor-Hobson Talysurf with a neat sketch. (8 marks)

OR

18. Explain different types of fits with pictorial representation of tolerance zones.

Module 5

19. Explain the construction, working and application of any four types of CMM with simple sketches.

OR

20. Explain the measurement of pitch, thread angle, and diameters of screw threads.
