

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIFTH SEMESTER B.TECH DEGREE EXAMINATION (R,S), DECEMBER 2023

MECHANICAL ENGINEERING

(2020 SCHEME)

Course Code : 20MET307

Course Name: Machine Tools and Metrology

Max. Marks : 100

Duration: 3 Hours

PART A

(Answer all questions. Each question carries 3 marks)

1. List the different types of shaper machines.
2. With suitable drawings briefly explain any two lathe operations.
3. Elucidate up milling process using a neat sketch.
4. Explain truing of grinding wheel.
5. List the advantages of gear finishing process.
6. What are the applications of broaching process?
7. Explain gross error.
8. Explain line standard of measurement.
9. List three advantages of Laser Interferometer.
10. Elucidate the various uses of comparators.

PART B

(Answer one full question from each module, each question carries 14 marks)

MODULE I

11. a) Differentiate Capstan and Turret Lathe. (8)
- b) Explain two work holding devices used in lathe. (6)

OR

12. Describe and label the various parts of a Shaper machine. List the three drive mechanisms. (14)

MODULE II

13. a) Using suitable drawing, explain horizontal milling machine and label the parts. (10)
- b) Explain lapping process using a sketch. (4)

OR

14. a) How a grinding wheel can be specified? Explain with the help of an example. (8)

- b) Explain simple indexing method in milling. (6)

MODULE III

15. a) Distinguish between internal and external broaching techniques. (10)
b) Explain gear shaving process. (4)

OR

16. Describe the various techniques used for gear manufacturing. (14)

MODULE IV

17. a) Explain plug, snap, slip and dial gauges using schematic illustrations. (8)
b) Elucidate the different types of fits using figures. (6)

OR

18. a) What is tolerance in Engineering? Explain unilateral and bilateral tolerances with diagrams. (10)
b) Define allowance and clearance in measurements. (4)

MODULE V

19. a) Define the following terms in surface texture measurements: - (8)
(i) Primary Texture, (ii) Secondary Texture, (iii) Lay, and (iv) Sampling Length
b) Explain the working of auto collimator using a neat diagram. (6)

OR

20. a) Describe i) Peak to valley high method. (ii) C.L.A. method and (iii) RMS method in surface roughness measurement. (10)
b) List two applications of Tool maker's microscope. (4)
