

Register No.: ..... Name: .....

**SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)**

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

**FIFTH SEMESTER B.TECH DEGREE EXAMINATION (Regular), DECEMBER 2022****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. Briefly discuss the significance of Chuck in a Lathe. Elucidate the various types of Chucks.
2. What is the difference between Counter-boring & Counter-sinking.
3. List the various face milling operations.
4. Discuss the various grades of grinding wheel
5. How is linear broaching different from rotary broaching?
6. What exactly is bevel gear and how is it made? Also mention few applications of this gear.
7. Define the following:
  - (i) Sensitivity
  - (ii) Calibration
  - (iii) Range
8. With suitable drawings, describe any three limit gauges.
9. In relation with measurements, explain flatness, roundness, and cylindricity.
10. List the various types of probes used by a CMM.

**PART B*****(Answer one full question from each module, each question carries 14 marks)*****MODULE I**

11. a) List any four Lathe operations with proper drawings. (8)
- b) Explain the various work-holding devices used for the Shaper machine with proper drawings. (6)

**OR**

12. Describe the significance of 'quick return mechanisms.' Explain any one such mechanisms used in Shaper. (14)

**MODULE II**

13. Using suitable drawing, explain the horizontal milling machine. Also label the parts (14)

**OR**

14. A grinding wheel has the following specifications.  
W C 40 L 4 R 18 (14)  
Identify the specifications and explain.

**MODULE III**

15. Explain any two types of broaching machines with neat figures (14)

**OR**

16. Describe the various gear finishing operations. Draw clear diagrams for each operation. (14)

**MODULE IV**

17. Define Limits, fits and Tolerances. Explain the different types of fits with proper examples. (14)

**OR**

18. With suitable diagrams, explain the following types of gauges. Also mention their applications. (14)
- (i) Plug gauge
  - (ii) Ring gauge
  - (iii) Snap gauge

**MODULE V**

19. Describe the principle and working of a Coordinate Measuring Machine. (14)

**OR**

20. Explain the significance of surface roughness measurement. (14)  
Describe the various terms used in surface roughness measurement.

\*\*\*\*\*