

Register No:

Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

EIGHTH SEMESTER B.TECH. DEGREE EXAMINATION(R), MAY 2024**Mechanical Engineering****(2020 SCHEME)****Course Code : 20MET452****Course Name : Industrial Tribology****Max. Marks : 100****Duration:3 Hours**

Scientific calculator and statistical table is allowed in the examination hall.

PART A*(Answer all questions. Each question carries 3 marks)*

1. Explain with neat sketches the working principle of SEM.
2. Explain any three surface roughness quantification techniques.
3. Explain the methods introduced to reduce the adhesive and ploughing components of friction.
4. Explain the different types of friction.
5. Discuss the friction & wear of ceramics and polymers.
6. Explain fretting and corrosive wear.
7. Discuss viscosity and its types.
8. Mention the different SAE classifications of lube oil based on viscosity.
9. With a neat sketch explain different parts of rolling bearing.
10. Explain surface engineering and its scope in modern manufacturing industry.

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

11. a) With a suitable sketch describe the topography of engineering surface . 7
- b) Differentiate between sliding and rolling contact bearings with neat sketches. 7

OR

12. a) Explain the physico-chemical characteristics of surface layers with the aid of a sketch. 8
- b) Explain the following surface roughness characterization methods a) Surface profilometry b) optical microscopy 6

MODULE II

13. a) Explain any two theories of friction. 8
- b) Explain the concept of plowing and adhesion in boundary lubrication. 6

OR

14. a) What are the different causes of friction? Explain with reference to asperity concept. 7
- b) Differentiate between the friction of metals and polymers. 7

MODULE III

15. Explain abrasive wear and adhesive wear with their mechanisms. 14

OR

16. a) What are the different types of wear? 7

b) How wear is quantified at trobo-contacts? 7

MODULE IV

17. Explain the classification of lubricants based on carbon distribution. 14

OR

18. List and explain any four desirable properties of a good lubricant. 14

MODULE V

19. Explain electro-chemical deposition techniques. 14

OR

20. Explain Physical Vapour Deposition and Chemical Vapour Deposition techniques with neat sketches. 14
