**M. Tech 3rd Semester (ME) CBCS Scheme**
**Examination, November-2023**
**TRIBOLOGY AND MAINTENANCE ENGINEERING**
**Paper–16MME23C1**

*Time allowed : 3 hours]* *[Maximum marks : 100*

***Note:*** *Attempt **five** questions. **Question no. 1 is compulsory** and **one** question from each of the four unit.*

**1.** Discuss the following: 4×5=20

(a) Boundary lubrication

(b) Opportunistic maintenance

(c) Bath tub curve

(d) Classification of bearings

**Unit-I**

**2.** (a) Explain the Engineering Tribological system in detail. Also discuss aim of Tribological treatment. 10

(b) Explain the material properties in detail influencing friction. 10

**3.** (a) Discuss friction measurement methods in detail. 10

(b) Discuss adhesion theory of friction with its drawbacks. 10

## Unit-II

4. (a) Explain the sources and effect of wear. Also discuss abrasive wear in detail. 10

   (b) Discuss the Elasto-hydrodynamic lubrication principle in detail. Also discuss properties and characteristics of lubricants. 10

5. (a) What are lubricant additives? Discuss the features of additives. 10

   (b) Explain the procedure for selection of bearings with the help of a flow chart. 10

## Unit-III

6. (a) Discuss the maintenance, objectives and costs associated with it. 10

   (b) Discuss the preventive maintenance in detail with a neat flow diagram. 10

7. (a) Discuss the role of quality and quality circle in maintenance. 10

   (b) Discuss the classification of maintenance system in detail. 10

## Unit-IV

8. Discuss the various NDT techniques in detail. 20

9. Discuss ferrography and spectroscopy methods in condition monitoring. 20