Paper id: 250642

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM VI) THEORY EXAMINATION 2024-25
TRIBOLOGY

TIME: 3 HRS M.MARKS: 100

Note: **Attempt** all Sections. In case of any missing data, choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

Q No.	Question	CO	Level
a.	Define viscosity index and its significance.	1	K2
b.	What are the primary causes of friction?	2	K2
c.	List the different modes of lubrication.	1	K2
d.	What is the role of lubricant additives?	1	K2
e.	Differentiate between adhesive and abrasive wear.	2	K2
f.	State any two properties of greases as lubricants.	1	K2
g.	Define minimum oil film thickness in hydrodynamic bearings.	3	K2
h.	What are the functions of solid lubricants?	4	K2
i.	Explain the term "friction angle" with respect to screw threads.	5	K2
j.	List two examples of tribo-design considerations in kinematic pairs.	5	K2

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a.	Explain the dependence of oil viscosity on temperature and pressure with suitable graphs.	1	K3
b.	Discuss different theories of dry friction in detail.	2	K3
c.	Explain the mechanism of pressure development in hydrodynamic bearings.	3	K3
d.	Describe the types and characteristics of wear-resistant coatings used for solid lubrication.	4	K3
e.	Discuss the tribological analysis of belt drives and cam follower systems.	5	K3

SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10

a.	Describe various properties of lubricants and their significance.	1	K4
b.	Explain the differences between mineral oil-based and synthetic lubricants.	1	K4

4. Attempt any *one* part of the following: 10 x 1 = 10

a.	Classify different types of wear and explain with diagrams.	2	K4
b.	Describe various methods used for measuring friction and wear.	2	K4

5. Attempt any *one* part of the following: 10 x 1 = 10

a.	Explain squeeze film and elasto-hydrodynamic lubrication with applications.	3	K4
b.	Discuss various types of rolling element and gas-lubricated bearings.	3	K4

6. Attempt any *one* part of the following: 10 x 1 = 10

a.	Describe deposition techniques used for applying solid lubricants.	4	K4
b.	Discuss friction and wear characteristics of lamellar solids.	4	K4

7. Attempt any *one* part of the following: 10 x 1 = 10

a.	Explain the operation and tribological design of a centrifugal clutch.	5	K4
b.	Describe point contact lubrication and its application in kinematic pairs.	5	K4