Subject Code: KME063

PAPER ID-420545

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

BTECH
(SEM VI) THEORY EXAMINATION 2021-22
TRIBOLOGY

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

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

a.	Explain the Industrial importance of tribology.
b.	Define friction, What are different types of friction.
c.	Explain delamination theory of wear in brief.
d.	Discuss major properties of ideal lubricant.
e.	How viscosity can be measured?
f.	Explain in brief hysteresis losses.
g.	What do you mean surface engineering?
h.	Explain difference between line contact lubrication and point contact lubrication.
i.	What are the advantages and disadvantages of bearing material explain in brief?
j.	Write down difference between cone clutch and centrifugal clutch.

SECTION B

2. Attempt any *three* of the following: 10x3=30

a.	What are the different methods of measuring frictional force? Explain any one
b.	Derive Petroff's eqation for lightly loaded journal bearing state assumptions.
c.	Define viscosity define and state Newton's law of viscosity, with a neat sketch.
d.	Explain construction and operating principle of Falling sphere viscometer and Flower's viscometer, with neat sketches.
e.	Explain Bowden and Tabor's Adhesion theory of friction.

SECTION C

3. Attempt any *one* part of the following: 10x1=10

a.	Explain in brief any five common surface hardening processes.
b.	Explain the basic requirements to be satisfied by any component for selection of a particular surface coating.

4. Attempt any *one* part of the following: 10x1=10

a.	List out wear mechanism. Explain any one wear mechanism.
b.	List out various wear testing methods clearly, mentioning their standards.

5. Attempt any *one* part of the following: 10x1=10

a.	List the characteristics of bearing materials, explain any two.
b.	Determine the common bearing alloys. Explain any two alloys.

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6. Attempt any *one* part of the following: 10x1=10

a.	Derive an expression for hydrostatic step bearing pressure distribution.
b.	A hydrostatic step bearing has the following specifications: Diameter of the shaft = 152 mm Diameter of the pocket = 102 mm Vertical thrust on the bearing =65000 N External pressure = 0 Shaft speed = 900 rpm Viscosity of lubricant = 24.15 CP Oil film thickness = 0.127 mm Find (i) Supply pressure (ii) Quantity of oil flow (iii) Power loss in the bearing (iv) Frictional force (v) Co-efficient of friction

7. Attempt any *one* part of the following: 10x1=10

a.	Derive an expression for load carrying capacity of a plane slider bearing with a fixed shoe.
b.	A slider bearing has a pivoted shoe by the following data: Length of the shoe in the direction of motion = 50 mm Width of the shoe = 64 mm Slider velocity = 5.5 m/s Load on the bearing = 8025 N Viscosity of the lubricant = 31cp Determine minimum oil film thickness, power loss and coefficient of friction of bearing, The inclination of the surface corresponds to minimum co-efficient of friction?