Enrolment Number: _____

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.TECH (lst MID EXAMINATION)
7th SEMESTER (SUMMER-2021-22)

SUBJECT NAME (CODE): TRIBOLOGY (203109435)   BRANCH: MECHANICAL

DATE: *05/08/2022*   TIME: 10:30PM TO 12:00

TOTAL MARKS: 40

Q.l   (A) Multiple Choice Questions   05

The following is (are) the example(s) of static friction

(A) Shoe brake applied to a vehicle   (B) Shoe brake applied to a train

(C) Dry grinding stone abrades the surface of metal   (D) All above

2   Tribology deal with which area

(A) Force   (B) Power

(C) Momentum   (D) Lubrication

3   100cP=   Poise

(A) 100   (B) 101

(C) 10   (D) 1

4   1000cSt=__   St

(A) 1   (8) 10

(C) 0.1   (D) 0.01

5   Following is a unit of Viscosity

(A) mm_3/Sec (B) mm_3/Sec_3

(C) mm_3/Sec_4 (D) Poise

(B) Compulsory Question   05

Define Tribology.

2   Define Viscosity.

3   Mention the assumption in Reynolds's equations.

4   Write the Reynolds equation for one dimensional only

5   Mention the five types of Hydrodynamic Thrust bearings.

Q.2   Attempt any Four (Short Questions)   12

          Define The lubricant's and mention the function of lubricant

     2   Comparison of sliding and rolling contact bearings (5 points minimum)

     3   Mention the newton's law of viscosity and describe the effect of temperature on
          viscosity.

     4   Describe the major factor affecting the selection of lubricants.

     5   Define the friction and mention the law of friction.

Q.3   Attempt any Two   08

       The following data refer to hydrodynamic full journal bearing (Infinite Short journal bearing)

       Journal diameter (d) = 75 mm

       Bearing Length (l) = 25 mm

       Journal Speed = 1550 rpm

       Eccentricity = 30 microns

       Radial clearance = 40 microns

       Viscosity of lubricant = 0.025 Pa-Sec

       Calculate: Load carrying capacity (W), Flow rate of lubricant (Qs)

     2   A hydrodynamic, 360 degree short journal bearing *lid* ratio *004* is to be designed to support a
          radial load of 6 KN. The journal rotates at 5100 RPM. The eccentric ratio is 0.6. if the central
          lubrication system supplies lubricating oil of viscosity 46.7 cP at flow rate of 0.5 liter per minute
          to the bearing. Calculate diameter of Journal.

     3   Describe the types of friction and its classifications.

Qo4   Derive the equation of pressure distribution for infinitely short (Narrow) journal bearing.   05

        Derive the pressure distribution equation for infinite width tapered pad thrust bearing   05

                                             OR

        Derive Petroff s equation containing two dimensionless parameters.   05