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D – 3443

Reg. No. :

Name :

Eighth Semester B.Tech. Degree Examination, December 2017
08.805.10 : TRIBOLOGY (MPU)
(2008 Scheme)

Time : 3 Hours

Max. Marks : 100

General Note : i) *Use of Design Data Hand Book is permitted.*

ii) *Answer **ten** questions from Part – A and **three** questions from Part – B.*

PART – A

1. Explain the difference between static friction and kinetic friction.
2. Write a quantitative relationship for abrasive wear and name the units of each term in it.
3. Enumerate the factors affecting wear.
4. Explain fretting wear.
5. State Newton's law of viscous flow and deduce the relation for fluidity of a Newtonian fluid.
6. Write the major assumptions used for the derivation of Petroff's equation.
7. Define bearing characteristic number. What is the significance of it ?
8. Compare hydrostatic and hydrodynamic lubrication.
9. Explain squeeze film journal bearing.
10. Define viscosity index.

(10×4=40 Marks)

P.T.O.



PART – B
Module – 1

11. a) Explain the adhesive wear in detail. 10
b) Discuss Molecular theory of friction and wear. 10

OR

12. a) Discuss in detail abrasive wear with sketches. 14
b) Derive Archard's law from fundamentals. 6

Module – 2

13. a) Derive an expression for the flow of liquid between parallel stationary plates with the usual notations. State clearly the assumptions made in the derivations. 10
b) With the help of a neat sketch explain the construction and working of Saybolt universal viscometer. 10

OR

14. State the assumptions made in derivation of Reynold's equation and derive the same. 20

Module – 3

15. a) Explain the mechanism of load support in hydrodynamic lubrication. 8
b) Following data is given for a 360° hydrodynamic bearing :
Radial load = 3.2 kN
Journal diameter = 50 mm
Bearing length = 50 mm
Journal speed = 1490 rpm
Radial clearance = 0.05 mm
Viscosity of lubricant = 25 cP.
Total oil flow is sufficient to carry the heat generated. Calculate :
a) Coefficient of friction.
b) Power lost in friction:
c) Minimum oil film thickness.
d) Oil flow requirement in l/min 12

OR

16. Analyze the hydrostatic bearing for load carrying capacity, frictional torque and power loss. 20

(3×20=60 Marks)