



Reg. No. :

Name :

First Semester M.Tech. Degree Examination, March 2013
(2008 Scheme)

Branch : Mechanical Engineering

STREAM : MDC 1004 : INDUSTRIAL TRIBOLOGY

Time : 3 Hours

Max. Marks : 100

- Instructions:** 1) Answer any five full questions.
2) All questions carry equal marks.
3) Any missing data may be assumed suitably.
4) All assumptions shall be clearly stated.
5) Approved design data handbook is permitted.

1. a) Differentiate between hydrodynamic and hydrostatic bearings.
b) Explain the mechanism of pressure development in hydrodynamic bearings.
2. a) What are the methods of failure of rolling element bearings ?
b) A ball bearing is to carry a radial load of 2.5 kN and a thrust load of 750 N. The bearing is to operate 40 hours per week for 3 years with light shock conditions. The shaft speed is 1440 rpm. Select a suitable bearing and calculate the probability of survival of the selected bearing.
3. a) Derive an expression for the viscous flow through a capillary tube.
b) Derive an expression for the pressure distribution of plane slider bearing.
4. a) List the different types of antifriction bearings and discuss their applications.
b) Select a single row deep groove ball bearing to withstand a radial load of 2.5 kN and a thrust load of 5 kN. The shaft runs at 1500 rpm. The expected average life for the bearing is 1700 days at 9 hours per day. Assume mild shock loads.



5. a) Discuss Reynold's theory of lubrication.
b) Discuss the advantages of hydrostatic bearings with reference to their lubrication.
 6. Write short notes on the following :
 - a) Viscosity and its variables
 - b) Factors affecting wear
 - c) Dry friction
 - d) Newtonian and non-Newtonian fluids
 - e) Lubricants and importance of lubrication.
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