Roll No .....

MMMD - 204

M.E./M.Tech. II Semester

Examination, December 2015

Industrial Tribology

Time : Three Hours

Maximum Marks : 70

Note : i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) What are the important properties of Bearing materials? Discuss in detail. 7

   b) What is boundary lubrication? Explain with the help of sketches in details. 7

2. a) Derive the Reynold's equation in 3D flow, giving the various assumptions used for deriving the same. 7

   b) What is mechanism of wear? Which type of wear finds application in industry? 7

3. a) Derive Petroff's equation for lightly loaded bearing. 7

   b) State the different theories of friction. Explain any one of them which is most widely accepted with neat sketches. 7

4. a) The following data refers to a hydrostatic thrust bearing : Thrust load=500kN, shaft speed=720r.p.m., Recess diameter=300mm, shaft diameter=500mm, Film thickness=0.15mm, Viscosity of lubricant=29.3 cP, calculate the supply pressure, flow requirement in lit/min and power loss in pumping. 7

   b) Explain the working principle of hydrostatic thrust bearing with figures. 7

5. a) Explain the EHD (Elasto-HydroDynamic) lubrication in detail. State the different examples of it. 7

   b) What are the advantages and disadvantages of hydrodynamic journal bearings. 7

6. a) Discuss in detail various Tribo-models for asperity contact. 7

   b) Discuss five laws of rolling friction. What are the causes of the rolling friction? How the rolling friction is measured? 7

7. a) Explain Tribological systems and their characteristic features. Explain one system in detail. 7

   b) Explain in detail the mechanism of lubrication. 7

8. Write short notes on any two of the following : 14
   a) Tribological aspect of wheel on rail contact
   b) Prevention of wear
   c) Tilting pad bearing

******