Total No. of Questions :8] *[Total No. of Printed Pages :2*

Roll No .....

MMMD/MMPD-302(A)

M.E./M.Tech., III Semester

Examination, June 2017

Fluid Film Lubrication

(Elective-II)

Time : Three Hours

 Maximum Marks: 70

Note : i) Attempt any five questions.

ii) All questions carry equal marks.

iii) Use of design data hand book is permitted.

iv) Assume suitable data or dimensions, if necessary, clearly mentioned it.

1. a) What do you mean by hydrodynamic lubrication? Explain with neat sketch.
   b) Give the classification of Bearings with their illustrations and applications.

2. a) What do you mean by boundary conditions? Write and explain the boundary conditions for infinitely long full journal bearing.
   b) What is hydrostatic lubrication? What are its advantages and disadvantages over hydrodynamic lubrications? Explain with sketches.

3. a) Explain with sketch the geometry of different types of non-circular bearings.
   b) Define kinematic viscosity and state the relationship between kinematic viscosity, dynamic viscosity and viscosity in SUS.

4. a) What are the gas bearing, where it used explain the mechanism of gas bearings and compare with oil bearings.
   b) Derive the governing equation for the gas bearings.

5. a) List the Numerical methods for solution of fluid film equations for bearing and explain any one of them.
   b) How do you express the life of a bearing? What is an average life of bearings? Discuss the methods used to improve the life of bearings.

6. A bearing is required to carry 4500 N, stationary radial load, the shaft rotates at 1000 RPM and the life desired is 30000 hours. The running conditions are steady, no shock loading. Select a suitable bearing.

7. Design a journal bearing to carry a radial load of 2500N. The journal having 50 mm diameter rotates at 1800 rpm. The viscosity of oil at the operating temperature is 25 cP.

8. Write short notes on followings. (Any four)
   a) Hydrostatic lubrication.
   b) Reynolds equations.
   c) Sommerfeld Conditions.
   d) Finite element method.
   e) Coefficient of frictions.
   f) Static characteristics of gas bearing.

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