GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

RM19002081

Registration No: | | | | | | | | | | |

Total Number of Pages : 2 **M.TECH**

M.TECH 2ND SEMESTER (AR 18) REGULAR EXAMINATIONS, APRIL/MAY 2019

BEARING AND LUBRICATION

Branch: MD, Subject Code:MMDPE2043

Time: 3 Hours **Max Marks : 70**

PART-A **(10 X 2=20 MARKS)**

1. Answer the following questions.

a) Why hydrostatic journal bearing is called externally pressurized bearing?

b) What is meant by hydrodynamic lubrication?

c) What are the commonly used materials for sliding contact bearings?

d) Define basic static load capacity, basic dynamic load capacity, eccentricity ratio and life of bearing.

e) Explain the following terms as applied to journal bearings : (a) Bearing characteristic number ; and (b) Bearing modulus.

f) Name some of the Wear resistance material (metallic & non-metallic) for engineering applications.

g) How the sliding speed effect on co-efficient of friction?

h) What do you mean by surface contaminants? What is their effect on surface contacts?

i) What is the difference between air film lubrication and oil lubrication?

j) What are the properties of a sliding contact bearing material?

PART-B **(5 X 10=50 MARKS)**

Answer any five questions from the following.

[5]

Q.2 a) Explain different Theories of Wearin detail. [5]

b) State approaches to Friction Control and Wear Prevention.

Q.3 a) State the advantages in pre loading of bearings and it effects. [5]

b)What are the properties required for selection of Bearing Materials. [5]

Q4

a) Derive an expression for load carrying capacity of an infinitely long journal bearing. Use full sommerfeld and half sommerfeld's condition. [5]

b) A full journal bearing is having the following specifications: [5]
Journal diameter = 100mm
Length to diameter ratio = 1.0
Radial clearance=0.025mm
Journal speed = 3000rpm
Operating eccentricity ratio = 0.6
Average viscosity of lubricant = 0.02Pa s
Assuming the bearing to be infinitely long and using full sommerfeld & half sommerfeld boundary conditions find bearing characteristics.

Q5

a) Explain the working principle of hydrostatic thrust bearing with figures. [5]

b) Derive the equation for pressure acting on hydrostatic annular thrust bearing. [5]

Q6

a) State and explain different types of lubricant and its applications. What are the properties of a good lubricant? [5]

b) What are the practical considerations to be made while designing bearings. Discuss such considerations in brief as related to size , clearance and load. [5]

Q7.

a) Derive Petroff's equation for lightly loaded bearing. [5]

b) The following data refers to a 3600 hydrodynamic bearing: [5]
Journal diameter = 40 mm, Bearing length = 20 mm,
Radial load = 6.5 kN, Journal speed = 1500 r.p.m.,
Radial clearance = 0.0, mm Oil viscosity = 25 cP.
Find the minimum oil film thickness, friction coefficient, oil flow and power lost in churning.

Q8 Write short notes on:

a) Bearing Materials [5]

b) Significance of Stricbeck curve in lubrication [5]

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