(Pages : 2) **A – 2285**

Reg. No. : .....

Name : .....

# Eighth Semester B.Tech. Degree Examination, April 2016
## (2008 Scheme)
## 08.805.10 : TRIBOLOGY

Time : 3 Hours Max. Marks : 100

***Instructions :*** *1) Answer **all** questions from Part **A**. **Each** question carries **4** marks.*
*2) Answer **one full** question from **each** Module in Part **B**. **Each full** question carries **20** marks.*
*3) Design data book is **permitted**.*

PART – A **(10×4 = 40 Marks)**

1. Differentiate between two body wear and three body wear.
2. Explain the mechanism of pressure development in oil film of hydrodynamic journal bearing.
3. Define wear. What are the parameters which govern wear ?
4. Differentiate between static friction and kinetic friction.
5. Discuss the factors considered in the selection of lubricants.
6. Explain the effects of temperature and pressure on viscosity of lubricants.
7. Explain the significance of Stribeck's curve in predicting the performance of a bearing.
8. Explain stick-slip phenomenon of friction.
9. State applications of hydrostatic bearings.
10. Write short note on solid lubricants.

PART – B

**Module – I**

11. Elaborate on the major and minor types of wear experienced in mechanical systems. **20**

OR

12. a) What are the causes of friction ? Discuss 'Adhesion theory of friction' in detail. **10**

    b) Derive an expression to find coefficient of friction for conical asperity based on abrasive theory of friction. **10**

**P.T.O.**

## Module – II

13. a) Derive Hagen Poiseulle equation applied to flow through a capillary tube. **10**

    b) State and explain the desirable properties of lubricants. **10**

OR

14. Derive Reynold's equation for hydrodynamic journal bearing stating all assumptions. **20**

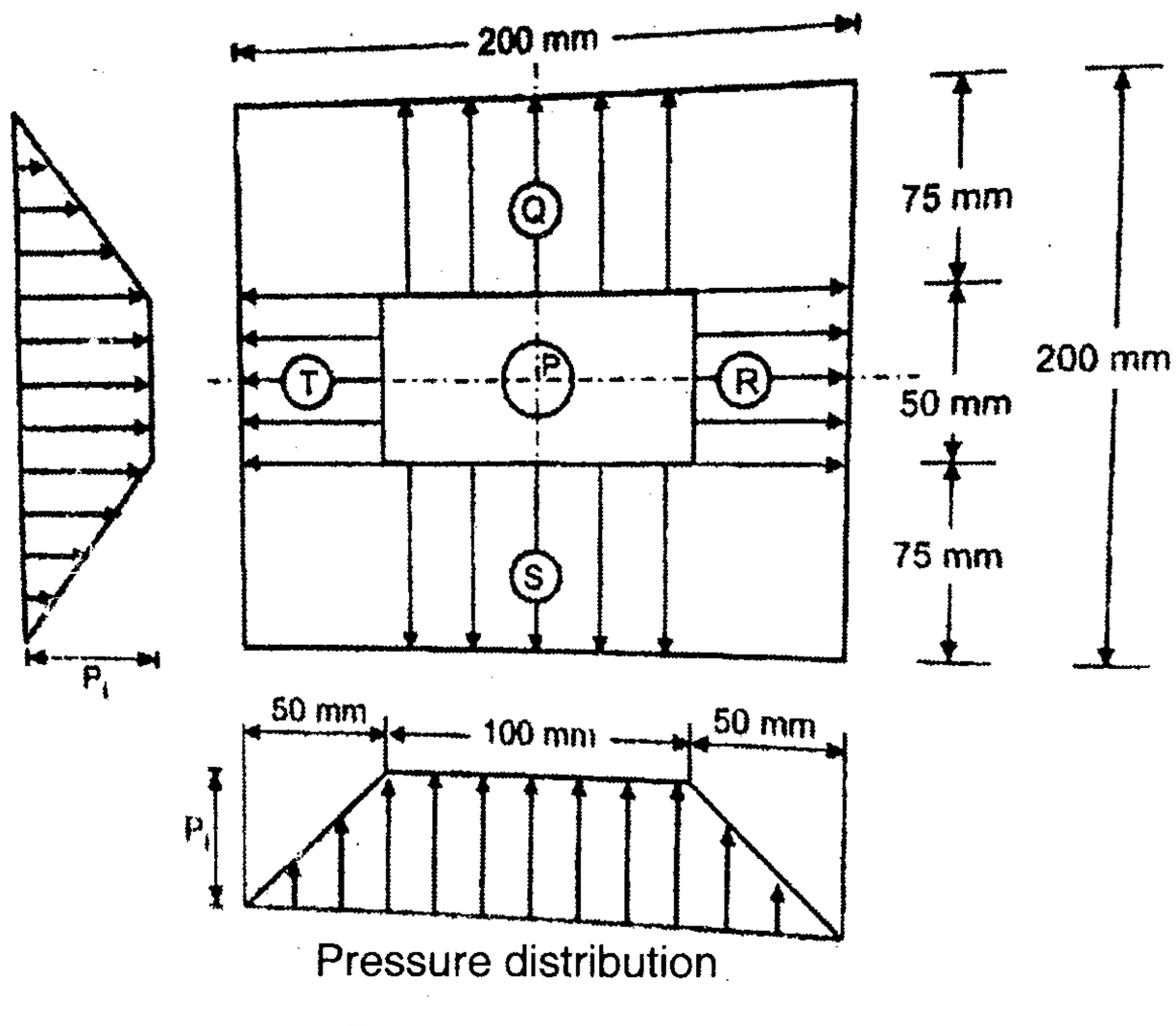
## Module – III

15. a) Derive Petroff's equation from fundamentals. **8**

    b) The hydrostatic thrust bearing with a rectangular oil groove 'P' of size (100 mm × 50 mm) is shown in figure. The thrust load on the bearing is 100 kN and the oil-film thickness is 0.02 mm. The viscosity of the lubricant is 300 cP. The pressure distribution can be assumed to be linear, varying from supply pressure at the inner edge to atmospheric pressure at the outer edge. Neglecting the flow over the corners, calculate

    i) supply pressure

    ii) oil flow rate. **12**




Pressure distribution

OR

16. Derive an expression for load carrying capacity and oil flow rate for a hydrostatic thrust bearing. **20**

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