Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

VII SEMESTER B.TECH. (AUTOMOBILE ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: TRIBOLOGY [AAE 475]

REVISED CREDIT SYSTEM
(02/01/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ANY FIVE FULL** questions.
- Missing data may be suitable assumed.

1A. What are the two important properties of a liquid? Briefly describe them with a suitable example **(02)**

1B. Explain Different types of Fluid Film Lubrication with suitable diagrams. Give the important parameters which leads to corresponding type of lubrication **(03)**

1C. What is terotechnology? What are the steps or processes involved in life cycle assessment of a product or system? **(05)**

2A. Enumerate the assumptions while deriving Fluid Film Lubrication derivation? **(02)**

2B. Explain deformation friction along with suitable diagram **(03)**

2C. List down the properties which needs to considered while choosing two types of Boundary Lubricants **(05)**

3A. Write a brief note on **(02)**

I. Bending
II. Bending Allowance

3B. Calculate the viscosity Index of the oil which has a kinematic viscosity at 40^oC of (ν_{40}) 135 centistokes and at 100^oC (ν_{100}) is 15 centistokes. (Table 1 is provided below for obtaining intended values) **(03)**

3C. What are Quasi – Solid Lubricants? Explain the different types of greases and attributes of them. **(05)**

4A. What is the effect of friction on rolling (bulk deformation process) **(02)**

4B. Deduce the expression for bearing geometry and pressure distribution of a tilted pad bearing with the aid of neat sketch. **(03)**

4C. Elucidate the working of cone-on-plate viscometer with a diagram. State the difference between viscometers and rheometers. **(05)**

5A. Explain hydrodynamic lubrication with a neat sketch. What are the characteristics and advantages of hydrodynamic lubrication? **(06)**

5B. What is the importance of sommerfeld number? How does co-efficient of friction vary with bearing modulus? **(04)**

6A. What are the types of bulk deformation process? Explain them with suitable examples. **(02)**

6B. State the Burwell and Strang laws of wear. **(03)**

6C. Derive the pressure distribution of a hydrostatic bearing with the aid of neat diagram. **(05)**

υ_{100}	L	H
14.6	283.0	143.9
14.7	286.4	145.3
14.8	289.7	146.8
14.9	293.0	148.2
15.0	296.5	149.7
15.1	300.0	151.2
15.2	303.4	152.6

Table – 1