Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

A Constituent Institute of Manipal University, Manipal

VII SEMESTER B.TECH (MECHANICAL/IP ENGG.) END SEMESTER EXAMINATIONS, NOV 2017

SUBJECT: PE-V: TRIBOLOGY [MME 4004]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL the** questions.

1A.	Define the following physical properties of mineral oils. (1) Viscosity (2) Specific heat (3) Fire point (4) Pour point (5) Drop point Explain the significance and importance of each of these properties.	**05**
1B.	Explain the following regimes of lubrication with examples a)Elastohydrodynamic lubrication b)Boundary lubrication	**05**
2A.	With neat sketches, compare hydrodynamic and hydrostatic bearings. Discuss their advantages and disadvantages	**04**
2B.	Derive the continuity equation in three dimensions	**04**
2C.	With examples explain hard EHL and soft EHL	**02**
3A.	What is friction instability? Explain how friction induced vibrations are produced	**03**
3B.	With neat sketches explain any TWO indirect techniques of friction and wear measurement	**04**
3C.	With sketches explain the abrasive and erosive mechanisms of wear	**03**
4A.	What are the general characteristics of the superficial layer obtained by machining?	**03**
4B.	What are the methods used for wear and corrosion control in surface engineering?	**04**
4C.	Schematically represent the area of activity of surface engineering and classify the different surface engineering technologies	**03**
5A.	Sketch and explain the difference between a Scanning Electron Microscope (SEM) and Transmission Electron Microscope (TEM)	**05**
5B.	Describe the three condition monitoring strategies and the methods used to monitor machines.	**05**