Reg. No.



(A constituent unit of MAHE, Manipal)

VII SEMESTER B.TECH (MECHANICAL/IP ENGG.) END SEMESTER EXAMINATIONS, NOV 2018

SUBJECT: TRIBOLOGY [MME 4004]

REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- ✤ Missing data if any, Can be suitably assumed

1A.	Write a note on importance of following additive types (a) Anti-wear and EP agent and (b) Corrosion and rust inhibitor.	04
1B.	Define regime indicator, how it is used to classify the various regimes of lubrication	03
1C.	Explain the different stages of hydrodynamic lubrication using schematic representation	03
2A.	Derive the continuity equation in three dimensions	05
2B.	Discuss in detail the effects contributing to the EHL film generation	05
3A.	Derive an expression for load carrying capacity of hydrostatic step bearing. State the assumptions.	04
3B.	Write a note on criticisms of Bowden and Tabor theory of friction. Briefly discuss the Bowden and Tabor's theory of friction	03
3C.	With sketches explain the abrasive and erosive mechanisms of wear	03
4A.	Define the superficial layer. How superficial layer can be strengthened and weakened, briefly explain.	04
4B.	Discuss the severe and less severe damage caused due to fatigue in gear meshing	03
4C.	Define (a) surface texture, (b) surface roughness and (c) waviness used in surface topography	03
5A.	Explain the difference between a Scanning Electron Microscope (SEM) and Transmission Electron Microscope (TEM)	05
5B.	Explain in detail the three types of maintenance schemes can be used in practice in condition monitoring. With neat sketch, describe the failure mode of machine vibration using bath tub curve	05