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Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)



VI SEMESTER B.TECH (MECHANICAL ENGINEERING) END SEMESTER EXAMINATIONS, MAY 2016

SUBJECT: FRICTION & WEAR [MME 340]

REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

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

1A.	Explain the concept of surface energy and derive the equation for the ratio					
	surface to volume work.	(5)				
1B.	Write a note on shapes of transferred and loose wear particles.					
2A.	Justify the following factors which contributes to the friction force:					
	Roughness component					
	Plowing component	(5)				
2B.	Derive the quantitative expression for abrasive wear.					
3A.	Write a note on the factors those effect the real contact area.	(5)				
3B.	Derive the expression for the size of the loose particles during adhesive					
	wear.	(5)				
4A.	Explain the following methods to measure friction:					
	Spring scale method					
	Weight and pulley method	(5)				
4B.	Explain the Mulhern and Samuels model for dropping off the wear rate.					
5A.	Distinguish between hydrostatic and hydrodynamic lubrication.					
5B.	Illustrate an example for the following types of wear:					
	➤ Galling					
	➢ Seizing					
	≻ Light	(3)				
5C.	Explain the temperature method to measure the surface interactions.					
6A.	How does solid lubricant behave below the melting point?					
6B.	State the quantitative laws of sliding friction.	(3)				
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6C. Write a note on brittle fatigue wear.

(2)