

**B.Tech. – VIEP – MECHANICAL ENGINEERING
(BTMEVI)**

Term-End Examination

June, 2018

00893

BIMEE-006 : TRIBOLOGY

Time : 3 hours

Maximum Marks : 70

Note : Answer any five questions. All questions carry equal marks.

1. (a) Define the term 'Tribology'. Mention its scope and applications in industry. 7
- (b) State the Laws of Friction and describe the working of cross-cylinder arrangement for measurement of friction. 7
2. (a) How is rolling friction different from sliding friction ? 7
- (b) Explain the quantitative laws of wear. Enumerate the importance of wear in engineering applications. 7

3. (a) What is bio-based lubricant ? Explain in brief. 7
- (b) What are the criteria for good bearing selection ? 7
4. State the assumptions made in derivation of Reynolds equation and derive the Reynolds equation in two dimensions. 14
5. (a) What are the different techniques employed in analysing the size, shape, structural and chemical details of wear particles ? Give a detailed description of any one of them. 7
- (b) Describe the physico-mechanical properties of surface layers using a neat sketch. 7
6. (a) What is surface topography ? Using a neat illustration, give the basic components of surface texture. 7
- (b) What are the techniques employed in the measurement of the real area of contact ? Describe in detail about any one of them. 7
7. (a) What are the additives for lubricating oil ? How are they classified ? What are their functions ? 7
- (b) Explain the working principle of plain slider bearing. 7

8. Write short notes on any **four** of the following :

$$4 \times 3 \frac{1}{2} = 14$$

- (a) Surface Contaminants
 - (b) Wear of Polymers and Ceramics
 - (c) Pitting
 - (d) Surface Roughness
 - (e) Concept of Boundary Layer
 - (f) Wear Reduction by Surface Improvements
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