| BIMEE-006 |

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

Term-End Examination

December, 2016

00333

BIMEE-006 : TRIBOLOGY

Time : 3 hours   *Maximum Marks : 70*

*Note : Attempt any **seven** questions. All questions carry equal marks.*

1. (a) Describe the term 'Tribology' with the help of suitable examples. State its significance with respect to economical, scientific and multidisciplinary aspects.   7

    (b) What is the role of surface films and interface debris in sliding friction ? Explain.   7

2. (a) State and explain the laws of rolling friction. Compare rolling friction and sliding friction.   7

    (b) Enumerate the importance of wear in engineering applications. Explain the quantitative laws of wear.   7

3. (a) Briefly explain the physico-mechanical properties of surface layer.   7

    (b) Discuss the effects of surface roughness on wear. Differentiate between waviness and roughness.   7

4. (a) Describe various methods used to reduce the wear.   7

    (b) What are the requirements to be fulfilled by a good lubricating oil ? Explain.   7

5. (a) How do you classify the types of lubrication ? Explain boundary lubrication with suitable sketch.   7

    (b) What materials would you consider for the manufacturing of bearings ? What characteristics should those materials possess ?   7

6. (a) Explain the working of journal bearing with neat sketch.   7

    (b) Describe when and why roller bearings are preferred over ball bearings.   7

7. Write short notes on any **four** of the following : $4 \times 3\frac{1}{2} = 14$

    (a) Dry Friction

    (b) Reynold's Equation

    (c) Real and Contour Area of Contact

    (d) Erosion and Stress Corrosion

    (e) Wear of Polymer and Ceramics

    (f) Surface Contaminants