Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

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ME-8003(1)-CBGS

B.E. VIII Semester

Examination, December 2020

Choice Based Grading System (CBGS)

Tribology

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

1. a) What do you mean by viscoelastic behaviour of material?

   b) What is rolling friction? Explain.

2. a) Discuss in details various tribo-models for asperity contact.

   b) What is the role of friction in Tribology?

3. a) Discuss lubrication requirements of a two wheelers.

   b) The flat face of a brass annulus having an outside diameter of 20 mm and an inside diameter of 10 mm is placed on a flat carbon steel plate under a normal load of 10 N and rotates about its axis at 100 rpm for 100 h. As a result of wear during the test, the mass losses of the brass and steel are 20 mg and 1 mg, respectively. Calculate the wear coefficients and wear depths for the bronze and the steel. (Hardness of steel = 2.5 GPa, density of steel = 7.8 Mg/m^3 hardness of brass = 0.8 GPa and density of brass = 7.5 Mg/m^3).

4. Explain different wear mechanisms. How wear in prevented?

5. What is Nano Tribology? How it can be applied to automotive applications?

6. a) Discuss desirable properties of good lubricant.
   b) What is DIN standards?

7. a) How do you distinguish between bearings from the standpoint of cooling conditions? Explain the categories with equation that are applicable under each.
   b) Define a seal. Draw the T-diagram of classification of seals. Explain the clearance seals with neat sketch.

8. Explain any two of the following in brief.
   i) Stick - slip characteristics of friction.
   ii) Interface temperature.
   iii) Plastic behaviour of material.

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