

Engineering Materials (MSE-220)

Assignment # 4

1) Describe the difference between wear and erosion.

Ans:

Wear is when a solid surface interacts with another solid surface causing damage and erosion is when a fluid interacts with a solid surface causing damage.

2) Name 3 types of erosion and describe how they damage a material.

Ans:

Solid Particle Erosion - The rapidly moving particle damages the surface when it impacts it.

Liquid Impact - Liquid droplets impacting the surface at high velocity causes damage.

Liquid Erosion - The motion of the liquid over the surface causes damage to the surface.

Slurry Erosion - The motion of the liquid and the fine particles in the liquid damage the surface.

Cavitation - A shock wave from the collapsing bubble causes damage to the surface.

3) What type of adhesive wear might be seen on an old working piston?

Ans:

Galling & Scoring/Scuffing

4) Mention the main 2 types of bearings

Ans:

Flat pad bearing

Revolute bearing

5) Mention the 3 types of lubrication.

Ans:

Solid Film, Oils, Greases

6) Name 3 types of friction?

Ans:

Possible answers:

Solid on solid, solid on solid + third body, fluid vs a solid, solid on solid + lubricant and solid rolling on another solid.

7) Why is it not advisable to self-mate plastics in a system?

Ans:

Plastics tend to friction weld when self-mated.

8) What materials are more suitable for liquid erosion conditions?

Ans:

Plastics and ceramics, as they are not vulnerable to liquid erosion.

9) Fill in the blank.

Brittle materials erode fastest when impingement is to the surface.

Ans: normal

10) How is static friction different than kinetic friction?

Ans:

Static friction acts on an object before it starts to move.

11) What is the equation for force of friction?

Ans:

$$F = \mu N$$

Note:

Read the given text and presentation slides for Chapter 5 very carefully and be ready for more difficult questions.