

Question 1: explain two types of friction; dry friction and fluid friction and give practical examples.

Dry friction: This is a force that opposes the relative lateral motion of two solid surfaces in contact. Dry friction is subdivided into static friction ("stiction") between non-moving surfaces, and kinetic friction between moving surfaces.

Example: Antifriction bearings, which have to operate without a liquid lubricant will experience high wear and friction. Also when driving your car tires experience a static friction.

Fluid friction: Describes the friction between layers of a viscous fluid that are moving relative to each other.

Example: Riding a bike. Also when swimming in water.

Question 2: Explain the following types of machines.

1. **Wedges:** This is a triangular shaped tool, and is a portable inclined plane, and one of the six classical simple machines. It can be used to separate two objects or portions of an object, lift up an object, or hold an object in place.
2. **Square-Threaded screws:** This form is a common screw thread form, used in high load applications such as leadscrews and jackscrews. It gets its name from the square cross-section of the thread. It is the lowest friction and most efficient thread form, but it is difficult to fabricate.
3. **Journal Bearings:** In a journal bearing, the shaft rotates inside a loose-fitting bearing shell of softer, often porous, bearing material. Lubricant, such as oil, grease or a low-friction compound like PTFE or graphite is used between the surfaces. The shell is sometimes split into two halves.