NAME: EBARETONBOFA TIEDOR RYAN

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**QUESTION 1**: Explain these two types of friction; dry friction and fluid friction and give practical examples.

**ANSWER**: **Dry friction** is simply defined as the force of opposition that one solid surface sliding across another solid surface exhibits. Dry friction always opposes the surfaces sliding relative to one another and can have the effect of either opposing motion or causing motion in bodies.

A practical example of intervening effects of dry friction is its occurrence between the tyres of a motorcycle and the road. This aids the motorcycle to undergo acceleration. Another practical example is the swift rubbing of the palms of one’s hands together to generate heat.

**Fluid friction** is defined as the force that resists motion either within a fluid itself or of another medium moving through the fluid. Constituently made up of internal friction, which is a result of the interactions between molecules of the fluid, and external friction, which refers to how a fluid interacts with other matter.

A practical example of actions of fluid friction is a piece of glass on another smooth glass surface. When dry, you can lift it off or move it easily but when a thin film of water is applied in between the surfaces, it becomes difficult to lift off, giving the impression that both surfaces are stuck together. Another practical example is Air resistance applying to a falling object causing it to slow down.

**QUESTION 2:** Explain the following types of machines;

1. Wedges
2. Square-Threaded Screws
3. Journal Bearings

**ANSWER**: A **Wedge** is a simple machine with a triangular shape consisting of 2 inclined planes, giving it a thin end and a thick end. It can be used to separate two objects or portions of an object, lift up an object, or hold an object in place. It can also be used to cut or split apart objects. Its mechanical advantage is the factor by which it multiplies force applied to the machine. A wedge applies more force to the object (output force) than the user applies to the wedge (input force), so the mechanical advantage of a wedge is greater than 1. A longer, thinner wedge has a greater mechanical advantage than a shorter, wider wedge.

A **Journal Bearing** is essentially a cylindrical shaft in a cylindrical cavity of larger diameter and the space between them contains a liquid lubricant. The purpose of a bearing is to support a load, typically applied to a shaft, whilst allowing relative motion between two elements of a machine. Journal bearings, also known as sliding or plain surface bearings, and rolling element bearings, sometimes also called ball bearings are seen to be the two general classes of bearings.

**Square-Threaded Screws** are screws that possess the common screw thread form, used in high load or heavy-duty applications such as leadscrews and jackscrews. As the name implies, it possesses a square cross-section thread pattern. It is one of the most used types of screw because it seen to be the lowest friction and most efficient thread form, but machining the thread is seen to be of great difficulty.