EZEKWONNA PASCHAL OKWUCHUKWU

MECHANICAL ENGINEERING

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**QUESTION 1**:

**DRY FRICTION:**

This is the force that opposes one solid surface sliding across another solid surface. Dry friction always opposes the surfaces sliding relative to one another and can have effect of either opposing motion or causing motion in bodies. The most commonly used model for dry friction is **coulomb friction**. Dry friction has two dominant components. One is associated to the displacement(Static friction) and the other is associated to the velocity(Kinetic friction).

A practical example of dry friction is Antifriction bearings, which have to operate without a liquid lubricant will experience high wear and friction.

**FLUID FRICTION:**

This is a force that resists motion either within the fluid itself or of another medium moving through the fluid. There is internal friction, which is a result of the interactions between molecules of the fluid, and there is external friction which refers to how a fluid interacts with other matter. This internal resistance to flow is named **Viscosity**. Fluid friction occurs between fluid layers that are moving relative to each other.

A practical example of Fluid friction, If there is a wet surface between two thin glass plates, you will notice that plates get stuck and the bottom plate doesn’t fall when you hold only the top one.

**QUESTION 2:**

**WEDGES:**

A wedge is a simple machine that transforms lateral force and movement of the tool into a transverse splitting force and movement of the work piece. The available power is limited by the effort of the person using the tool, but because power is the product of force and movement, the edge amplifies the force by reducing the movement. A double inclined plane. Mechanical advantage is considerably resisted by friction. This amplification or mechanical advantage is the ratio of the input speed to output speed. The faces of a wedge are modelled as straight lines to form a sliding or prismatic joint.

**SQUARE-THREADED SCREWS:**

This is the strongest and lowest friction thread, with a 0° thread angle, and doesn't apply bursting force to the nut. However it is difficult to fabricate, requiring a single point cutting tool due to the need to undercut the edges. It is used in high load applications such as jack screws and lead screws but has been mostly replaced by the Acme thread. A modified square thread with a small 5° thread angle is sometimes used instead, which is cheaper to manufacture.

**JOURNAL BEARINGS:**

Journal bearings make use of a pressure wedge of fluid that forms between the rotating shaft and the bearing. The portion of the shaft supported by the bearing is called the journal and is usually hardened for wear-resistance. A journal bearing that has developed this full hydrodynamic lubrication could run forever as there is no wear. Journal bearings are affected by the misalignment between bearing and shaft as its presence tends to hamper the formation of the fluid film.