**IKEBUJO DELIGHT NKEMJIKA**

**17/ENG06/043**

**MECHANICAL ENGINEERING**

**QUESTION 1**

It is generally considered that in engineering application problem, there are no perfectly frictionless surfaces. Explain these two types of friction; dry friction and fluid friction and give practical examples.

**Answer**

Dry friction 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 the effect of either opposing motion or causing motion in bodies. Dry friction is directly proportional to the normal force between the two surfaces in contact. Dry friction depends on the materials in contact. This factor is measured by the quantity known as the coefficient of friction which is the ratio of the friction force to the normal force.

Practical examples of dry friction are;

•friction between a motorcycle tires and the road

•a person riding bicycle and pressing the brakes

Fluid friction is the 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. Fluid friction could also be called drag and drag is a kind of frictional force exerted by fluid which opposes the motion of an object through that fluid.

Practical examples of fluid friction are;

•the automatic transmission in a car. The torque converter is possible because of fluid friction.

•trying to put toothpaste on the toothbrush.

•flow of ink in ball pens.

**QUESTION TWO**

Explain the following types of machines;

Wedges: A wedge is simply a triangular tool, often made of metal, wood, stone or plastic. It is thick on one end and tapers to a thin or sharp edge on the other end. Technically it is an inclined plane (or two inclined planes put together to form a triangle) that moves. A wedge may be attached to a handle to make it easier to use. Good examples of wedges are nails, knives, axes and your teeth!.

Wedges work by changing direction and force applied to it.

Square-Threaded Screws: this is a a screw thread so made that the sides, root, and crest of any section formed by a plane that passes through the thread axis are all equal theoretically to one half the pitch. Basically It gets its name from the square cross-section of the thread.

Journal Bearings: Journal or sleeve 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. As one of the most common types of hydrodynamic bearings. Their primary purpose is to support a rotating shaft. They are used in various subsystems in engines and power trains, for example for support of both crankshaft and camshaft.