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MEE 312 : Mechanics of machines

- ## Question 1

Dry friction is one the several types of friction, **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, most commonly understood through Coulomb's friction model, is divided into Static andKinetic friction. **Static friction** being frictional force to be overcome when a solid object, at rest on another surface, is to be moved along the surface.
While Kinetic friction, Taking a box at rest on a flat inclined surface, occurs beyond the point of impending motion when the box is sliding. With kinetic friction, the magnitude of the friction force opposing motion will be equal to the kinetic coefficient of friction times the normal force between the box and the surface. The kinetic coefficient of friction also depends upon the two materials in contact, but will almost always be less than the static coefficient of friction.
EXAMPLES;

1) Tires of a car on a road
2) Threading process on a lathe machine
3) Sawing process

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.
Internal friction
is an internal force that resists the movement between the particles of a material. This potential internal movement can be due to either external forces or change in temperature and deformation. This friction force is called more precisely as static internal friction sometimes, and it is different from the kinetic internal friction force. The static internal friction force acts against the shear stress between the particles and tries to keep them stationary and in place.
External Friction
It arises when two bodies in contact with each other try to move or there is an actual relative motion between the two. The external friction is also called **contact friction**.
EXAMPLE

1) Viscosity of honey
2) Air resistance
3) Water flowing through a tube

- QUESTION 2

WEDGES;

Is a triangle shaped tool, which is 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. There are two types of wedges; SIngle and Double wedges which include examples such as Axes and Knives for double. And, doorstop and chisels for single.

Journal Bearing:

Metal sleeves that fit around a shaft, the sleeve is held in place within a housing. The Journal is simply the place on the shaft that is supported by the bearing. Examples include Brass or bronze for metallic bearing and Phenolic for non-metallic.
Phenolic is used in power generating applications because it does not conduct electricity. Then there is Babbitt which is a soft metal alloy.
There are two types of Journal bearing;

1) Solid journal bearing: Consist of a 1 piece sleeve in a 1 piece housing also called a bushing. It is a relatively thin solid bearing that is mostly strengthened by its housing.
2) Split Journal Bearing: A split bearing refers to a two piece bearing mounted in a two piece housing, due to the fact it is more easily disassembled. Making it more easily serviced.

Square Threaded Screws

It's an inclined plane wrapped around a shaft, like a wedge. It Functions by pushing a weight up and down the plane as the screw is tightened.