OYUGBO ESEOSE VALERIE

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MECHANICAL ENGINEERING

MECHANICS OF MACHINES

1 a.) 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 or causing motion in bodies. The commonly used model for dry friction is coulomb friction. this type of friction can further be broken down into static and kinetic friction. Example: Dry friction occurs between the bottom of a training sled and a grassy field. It also occurs between the tires of a motorcycle and the road.

b.) 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 the molecules of the fluid, and there is external friction which is referred to how a fluid interacts with other matter. Example: a swimmer’s body and the surface of water. a bird soaring in the air.

2 a.) Wedges: A wedge is a triangular shaped tool and a portable inclined plane. It can be used to separate two objects or portions of an object, lift up an object or hold an object in place. It functions by converting a force applied to its blunt ends into forces perpendicular to its inclined surface. The mechanical advantage of a wedge is given by the ratio of the length of its slope to its width.

b.) Square threaded screws: The square thread form is a common acre thread form, used in high load applications such as lead-screws 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. The greatest advantage of square threads is that they have a much higher intrinsic efficiency than trapezoidal threads. The greatest disadvantage is the difficulty in maintaining such a thread.

c.) Journal bearings: This is the simplest type of bearing, comprising of just a bearing surface and no rolling elements. Therefore, the journal slides over the bearing surface. The simplest example is a shaft rotating in a hole. Journal bearings in general are the least expensive type of bearing. They are also compact and lightweight, and they have a high load-carrying capacity.