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QUESTION ONE

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.

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 the effect of either opposing motion or causing motion in bodies. The two regimes of dry friction are static friction between non-moving surfaces, and kinetic friction between moving surfaces.

A practical example of dry friction is antifriction bearings which have ti operate without liquid lubricant will experience high wear and friction

FLUID FRICTION: This 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 another matter.

A practical example of fluid friction is a fluid flow e.g in a tube, not as solid ‘plug', but with more or less complicated internal motion with continuously changing velocities at all points of reference in the fluid.

QUESTION TWO

EXPLAIN THE FOLLOWING TUPES OF MACHINES: WEDGES, SQUARE-THREADED SCREWS AND JORNAL BEARINGS.

WEDGES: This 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 plane put together to form a triangle) that moves. A wedge may be attached to a handle to make it easier to use. Examples are nails, knives and axes.

SQUARE-THREADED SCREWS: The square thread form is a common screw 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.

JOURNAL BEARINGS: Journal or plain bearings consist of a shaft or journal which rotates freely in a supporting metal sleeve or shell. There are no rolling elements in these bearings. Their design and construction may be relatively simple, but the theory and operation of these bearings can be complex.