
1. The sign of work done by a force on a body is important to understand. State carefully if the following quantities are positive or negative:

- a. work done by a man in lifting a bucket out of a well by means of a rope tied to the bucket.
- b. work done by the gravitational force in the above case,
- c. work done by friction on a body sliding down an inclined plane,
- d. work done by an applied force on a body moving on a rough horizontal plane with uniform velocity,
- e. work done by the resistive force of air on a vibrating pendulum in bringing it to rest.

Sol. Work done, $W = T.S = Fs \cos\theta$

- a. Work done is positive, because the force is acting in the direction of displacement i.e., $= 0^\circ$
- b. Work done is negative, because the force is acting against the displacement i.e., $= 180^\circ$
- c. Work done is negative, because the force of friction is acting against the displacement i.e., $= 180^\circ$
- d. Work done is positive, because the body moves in the direction of applied force i.e., $= 0^\circ$
- e. Work done is negative, because the resistive force of air opposes the motion i.e., $= 180^\circ$