WORK = (11/14) FORCE * DISTANCE

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ABSTRACT :

The work done is the measure of the kinetic energy of the body .The kinetic energy of a body is the energy possessed by the body by virtue of its motion .The work is said to be done by a force acting on a body such that the body is displaced actually in any direction except in a direction perpendicular to the direction of force. The energy is the ability of a body to do the work.

Rotation is motion and vice versa. If a force is applied on a wheel and that force simultaneously converts to the centripetal force as well as the centrifugal force then the wheel moves forward. So every point of the wheel moves vertically on a curved path to cover horizontally on a straight line path.

The following laws are derived from the above facts as follows ,

LAW OF MOTION   ------------------- Nrusingh's 1st law

(a) INERTIA OF REST : A body is at rest, until the applied force on it , converts to the centripetal force as well as the centrifugal force

(b) INERTIA OF MOTION : A body is at motion, as long as the applied force on it , converts to the centripetal force as well as the centrifugal force

The following law is derived from Nrusingh's 1st law

THE FORCE OF ACTION IS ALWAYS EQUAL TO THE SUM OF OPPOSITY REACTION AND ABSORPTION ---------------------- Nrusingh's 2nd law

This implies that, **14 PARTS ACTION = 11 PARTS REACTION + 3 PARTS ABSORPTION**

So **1 part action = (11/14) part reaction + (3/14) part absorption**

The following laws are derived from Nrusingh's 2nd law

FORCE = (11/14) MASS * ACCELERATION ----- Nrusingh's 3rd law

ENERGY = (11/14) MASS (VELOCITY OF LIGHT)^2 ---- Nrusingh's 4th law

PRESSURE * VOLUME = (11/14) TEMPERATURE ---- Nrusingh's 5th law

PRESSURE = (11/14) FORCE/AREA ---- Nrusingh's 6th law

# Energy = (11/14) frequency ---- Nrusingh's 7th law

WORK = (11/14) FORCE * DISTANCE

KEY WORDS :

Work, Force, Distance, Constant of proportional, Absorption, Action, Reaction, Centripetal force, Centrifugal force, Cycloid path, Straight line path

INTRODUCTION :

If a force is applied to a wheel so that the force is converted to the centripetal force as well as the centrifugal force then every point of the wheel moves vertically **8r length** in a cycloid path by the centripetal force and Simultaneously the same point covers horizontally **$2\pi r$ length** on a straight line path by the centrifugal force **The cycloid is a curved path, which is traced out by a point on a circle that rolls on a straight line .**

Curved Path = 8 r

Straight line path=$2\pi r$
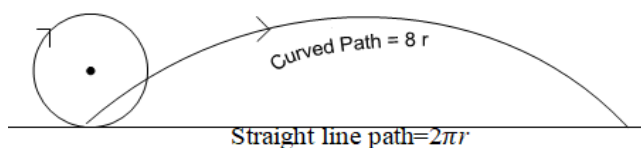
Suppose s_1= length of the cycloid path and s_2 = length of the straight line path

So $s_1 = 8\,r$ and $s_2 = 2\,\pi\,r$

Hence $8r > 2\pi r \implies s_1 > s_2$

Here $\dfrac{ds_1}{dt} = v_1$ = Velocity of any point on the cycloid path,

And $\dfrac{ds_2}{dt} = v_2$ = Velocity of the same point on the straight line path

As $s_1 > s_2 \implies \dfrac{ds_1}{dt} > \dfrac{ds_2}{dt}$

So $v_1 > v_2 \implies mv_1 > mv_2 \implies m\dfrac{dv_1}{dt} > m\dfrac{dv_2}{dt} \implies ma_1 > ma_2$

where $\dfrac{dv_1}{dt} = a_1$ = Acceleration of any point on the cycloid path

and $\dfrac{dv_2}{dt} = a_2$ = Acceleration of the same point on the straight line path

Hence $ma_1 > ma_2 \implies F_1 > F_2$

Here $F_1 = ma_1$ and $F_2 = ma_2$

But **the magnitude of the centripetal force is equal to the magnitude of the centrifugal force.**

Hence $F_1 > F_2$

$\implies F_1 - F_2 =$ **SOME ABSORBED FORCE**

$\implies F_1 = F_2 +$ **SOME ABSORBED FORCE**

Here $F_1=$ **CENTRIPETAL FORCE**

= **ACTION FORCE**

and $F_2 =$ **REACTION FORCE**

Hence **CENTRIFUGAL FORCE =**

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F_2 + **SOME ABSORBED FORCE**

= **REACTION FORCE**

+ **SOME ABSORBED FORCE**

So **ACTION FORCE** =

REACTION FORCE + ABSORPTION FORCE

=> **ACTION** = **REACTION + ABSORPTION**

This implies that, when

ACTION = **REACTION + ABSORPTION**

Then the body moves

But when **ABSORPTION = 0**

Then **ACTION** = **REACTION + ABSORPTION**

= **REACTION + 0** = **REACTION**

=> **ACTION** = **REACTION**

So the body does not move

SUBJECT MATTER :

Rotation is motion and vice versa. A body is at rest, until the applied force on it, converts to the centripetal force as well as the centrifugal force .

A body is at motion, as long as the applied force on it , converts to the centripetal force as well as the centrifugal force .

When a force is applied to a wheel and that force simultaneously converts to the centripetal force as well as the centrifugal force then the wheel rotates and moves in a curved path to cover a straight line path.

Both the vertical cycloid path and the horizontal straight line path of a point make the wave.

The length of the vertical cycloid path of the wave is **8r** and the length of the horizontal straight line path of the same wave is 2π**r.**

Every point of a wheel moves **8r length** on the cycloid path by the centripetal force and simultaneously the same point of the wheel covers 2π**r length** on the straight line path by the Centrifugal force.

Hence $F_1 : F_2$ =

ACTION OF CENTRIPETAL FORCE :

REACTION OF CENTRIFUGAL FORCE

So $F_1 : F_2$ =8r : 2π**r** = 8r : (2 * 22/7)r

= (8 * 7/7)r : (2 * 22/7)r

= (56/7)r : (44/7)r = 56r : 44r

= 42r : 33r = 28r : 22r = 14r : 11r

Here r is the radius of the circle, which makes the cycloid path.

The value of r may be any positive number or any positive fractional number , when **r = 1** , 14r : 11r = 14 : 11

r = 2 , 14r : 11r =28 : 22, and so on

Hence $F_1 : F_2$ = 14 : 11

This implies that, whatever values of **r** may have ,

But $F_1 : F_2$ = 14 : 11

This implies that,

" **TO EVERY 14 PARTS OF ACTION , THERE IS 11 PARTS OF REACTION** "

But **the magnitude of the centripetal force is equal to the magnitude of the centrifugal force.**

So each one of the centripetal force as well as the centrifugal force must do equal amount of work .

But here the centripetal force does more work than the centrifugal force, So some amount of centrifugal force is absorbed on the road for which it could not do equal amount of work with the centripetal force.

Hence   14 PARTS ACTION – 11 PARTS REACTION = 3 PARTS ABSORPTION

 To every 14 parts of action, there is 11 parts of reaction and 3 parts of absorption .

This implies that ,

 14 PARTS ACTION = 11 PARTS REACTION + 3 PARTS ABSORPTION

=> **1 PART ACTION = (11/14) PART REACTION + (3/14) PART ABSORPTION**

This implies that ,

 1 part of the centripetal force =

       1 part of the centrifugal force

This implies that ,

1 part of the centripetal force = (11/14) part of the centrifugal force used for motion + (3/14) part of the centrifugal force used for absorption.

CASE - I

 If 1 part of a force is applied to a wheel then only (11/14) part of that force makes the wheel to move and the rest (3/14) part of the force is absorbed in the medium.

The force ,which is responsible for the wheel to move a distance is the working force.

As **1 part force = (11/14) part working force + (3/14) part absorbing force**

Hence   **working force = (11/14) part of force = (11/14) Force = (11/14) F**

When a constant force acting on a body produces a displacement,

 Then **the work done by the force is the dot product of the working force and the displacement.**

This implies that ,

Work done = working force * distance

So **Work done = Work**

   = (11/14) F * S = W

=> **W = (11/14) F * S**

Here   S = distance = displacement **working force = (11/14)Force = (11/14)F**

This implies that ,

 WORK

   = (11/14) FORCE * DISTANCE

CASE - II

Work is defined as the force acting on a body, which is responsible for the displacement of the body.

Work is defined as a force causing the displacement.

Work is a form of energy. Work done is equal to the energy transferred.

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Energy is the ability to do work.

The work is directly proportional to the product of the force and its displacement

Mathematiclly, It can be expressed as follows ,

Work $\propto$ Force * displacement

$\Rightarrow$ **Work = k Force * displacement**

= **k Force * distance**

Here **S = displacement= distance**

But **1 PART ACTION = (11/14) PART REACTION + (3/14) PART ABSORPTION**

This implies that ,

1 part of the centripetal force = (11/14) part of the centrifugal force used for motion + (3/14) part of the centrifugal force used for absorption.

This implies that,

Out of 1 part of the action force, only (11/14) part of that action force works and the rest (3/14) part of the action force is absorbed in the medium .

So **only (11/14) part of the force works out of 1 part of the force .**

This implies that ,the value of the constant of proportional is (11/14) .

So **k = (11/14)**

Putting the value of k = (11/14) in the equation,

Work = k Force * distance

It is obtained that ,

WORK = (11/14) FORCE * DISTANCE

= (11/14) F * S

$\Rightarrow$ **W = (11/14) F * S**

CONCLUSION :

Work is the energy transferred to an object by force. So **W = (11/14) F.s cos θ**

when displacement is produced in the direction of application of force,

Then **θ = 0 $\Rightarrow$ cos θ = cos 0 = 1**

So **W = (11/14) F.s cos θ**

= (11/14) F.s cos0

= (11/14)F.s.1

= (11/14) F s

$\Rightarrow$ **W = (11/14) F s**

$\Rightarrow$ **Work = (11/14) Force * distance**

Although work done is scalar quantity its value may be positive, negative or zero.

(a) Positive work:

When **θ** is **acute,**

So **cosθ** is **positive**

Then **W = (11/14) F s cosθ** is **positive**

So **Work is positive**

(b) Negative work:

When **θ is obtuse,**

So **cosθ is negative**

Then **W = (11/14) F s cosθ is negative**

So **Work is negative**

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(c) Zero work:

When the applied force F or the displacement s or both are zero

Then   W = **(11/14) F s cos θ = 0**

=> **Work** = **0**

Again when the angle θ

between F and s   is right angle ,

 So cos θ **= 0**

Then   W = **(11/14) F s cos θ = 0**

=> **Work** = **0**

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