



THE ACCELERATION DUE TO GRAVITY OF AN OBJECT IS 11m/s^2 ON THE EARTH

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ABSTRACT

Rotation is motion and vice versa .Every point of a wheel moves simultaneously in a vertical curved path as well as a horizontal straight line path in a rotation . 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 everybody moves vertically in a curved path to cover horizontally on a straight line path. The following three laws are derived from the motion of a wheel on the road .

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 OPPOSITE REACTION AND ABSORPTION” ----- Nrusingh's 2nd law

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

The following law is derived from the motion of a body

“ THE ACCELERATION OF A BODY IS DIRECTLY PROPORTIONAL TO THE RESULTANT FORCE AND INVERSELY PROPORTIONAL TO ITS MASS ”

The following law is derived from **Nrusingh's 2nd law**

Force = (11/14) mass * acceleration ----- Nrusingh's 3rd law

where (11/14) is the constant of proportionality

The following equation is obtained from **Nrusingh's 2nd law,**

“ 14 PARTS ACTION = 11 PARTS REACTION + 3 PARTS ABSORPTION “

This implies that , when a wheel moves with 14 parts of force then 3 parts of the force is absorbed on the road and simultaneously the rest 11 parts of the force makes the wheel to move forward . The wheel moves on the Earth by 11 parts of the force as the rest 3 parts of the force of the wheel is absorbed by the road due to the gravitational force of the Earth .

This implies that the wheel accelerates 11 parts distance on the road due to the gravity of the Earth. Hence **the acceleration due to gravity of an object is 11m/s^2 on the Earth** .

KEY WORDS :

Absorption, Action, Reaction, Cycloid, Centripetal force, Centrifugal force , Force ,Mass , Acceleration , Constant of proportionality ,Acceleration due to gravity

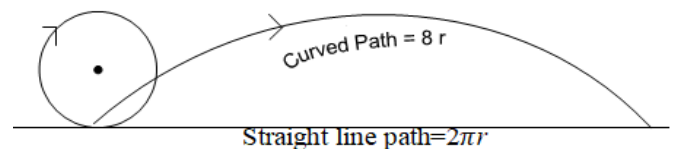
INTRODUCTION :

Action means, the force exerts on the second body by the first body. Reaction means, the force exerts on the first body by the second body. Absorption means, the amount of force is absorbed in the second body .When a force is applied on a body and that applied force simultaneously converts to the centripetal force and centrifugal force then the body moves some distance. That is, by the action on the body, the body moves some distance by its reaction and absorption .

A deer jumps in a curved path to cover a straight line path. A frog jumps in a curved path to cover a straight line path. A bird flies in the air making curves by its wings. A fish swims in the water making curves by its fins. A stone thrown in the air, moves in a curved path to cover a straight line path. Snake moves on the ground by making many curves to cover a straight line path. Water flows in the river by making numerous curves to cover a straight line path. While walking, every foot of a man rotates to move simultaneously in a curved path As well as a straight line path.

The wheel of a vehicle moves uniformly on a road.

So the action, reaction and absorption relation can be derived accurately from the motion of a wheel on the road.



SUBJECT MATTER :

When a force is applied to a wheel, the wheel rolls on the road so that every point on it which touches the road moves vertically on a cycloid path to cover horizontally on a straight line path in its every rotation .The cycloid is a curved path, which is traced out by a point on a circle that rolls on a straight line .The length of the cycloid path is calculated by the length formula of calculus as $8r$ and the length of the horizontal straight line path is $2\pi r$, where r is the radius of the circle which generates the cycloid.

Every point rotates on the wheel to move vertically on a cycloid path, which is a part of the circular path.

Hence the centripetal force acts on the cycloid path. Centripetal force is a force, which is required to move a body uniformly on a circle. This force acts along the radius and directed towards the centre of the circle.

While moving along a circle the body has a constant tendency to regain its natural straight line path. This tendency gives rise to a force, which is called the centrifugal force. It acts along the radius and away from the centre of the circle. Centripetal force is the action force and centrifugal force is the reaction force as well as absorption force. The centripetal force and the centrifugal force are equal in magnitude and opposite in directions. So where is centripetal force, there is centrifugal force also.

Every point on the wheel moves vertically $8r$ length by the centripetal force and simultaneously the same point covers $2\pi r$ length horizontally by the centrifugal force.

Suppose s_1 = length of the cycloid path and s_2 = length of the straight line path
So $s_1 = 8r$ and $s_2 = 2\pi r$

Here $8r > 2\pi r \Rightarrow s_1 > s_2$

Let v_1 = Velocity of any point on the cycloid path = $\frac{ds_1}{dt}$

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

As $s_1 > s_2 \Rightarrow \frac{ds_1}{dt} > \frac{ds_2}{dt}$

So $v_1 > v_2 \Rightarrow mv_1 > mv_2$

$$\Rightarrow m \frac{dv_1}{dt} > m \frac{dv_2}{dt}$$

$$\Rightarrow ma_1 > ma_2$$

where $\frac{dv_1}{dt} = a_1$, $\frac{dv_2}{dt} = a_2$

This implies that $F_1 > F_2$

where $F_1 = ma_1$ and $F_2 = ma_2$

Here F_1 = CENTRIPETAL FORCE

Which is applied on the point of the wheel, So the point moves $8r$ length on the cycloid path. The magnitude of the centripetal force is equal to the magnitude of the centrifugal force. This implies that,

$$F_1 = F_2 + \text{SOME ABSORBED FORCE}$$

$$\text{As } F_1 > F_2$$

So $F_2 + \text{SOME ABSORBED FORCE}$

$$= \text{CENTRIFUGAL FORCE}$$

Centrifugal force is utilized on the Straight line path, as a result absorption and motion of the wheel takes place simultaneously there. This implies that

ACTION FORCE =

$$\text{REACTION FORCE + ABSORPTION FORCE}$$

Hence

$$\text{ACTION = REACTION + ABSORPTION}$$

If force is applied to a wheel then every point of it moves vertically $8r$ length by the centripetal force and simultaneously the same point covers $2\pi r$ length horizontally by the centrifugal force. This fact implies that ,

ACTION OF CENTRIPETAL FORCE :

$$\text{REACTION OF CENTRIFUGAL FORCE}$$

$$= 8r : 2\pi r = 8 : 2\pi = 8 : (2 * 22/7)$$

$$= (8 * 7/7) : (2 * 22/7) = 56/7 : 44/7$$

$$= 56 : 44 = 14 : 11$$

This implies that,

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

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 centrifugal force must do equal amount of work .But here centripetal force does more work than the centrifugal force.

This implies that ,

Some amount of centrifugal force is absorbed in the road, that is why it could not do equal amount of work with centripetal force .

Hence

14 PARTS ACTION –11 PARTS REACTION =
3 PARTS ABSORPTION

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

Hence

**14 PARTS ACTION = 11 PARTS REACTION
+ 3 PARTS ABSORPTION**

This implies that ,

ACTION = REACTION + ABSORPTION

When the force is applied to a wheel and that applied force is converted to centripetal force as well as centrifugal force ,then the wheel moves on the road.

Earth has the gravity by which it draws the objects towards its centre .

Gravity is a force of attraction that exists between any two bodies or any two particles.Nrusingh’s 2nd law states that , As the road absorbs 3parts of the force from the wheel ,

So the road allows the wheel to move on it by the rest 11 parts of the force .

The road is in the Earth, So the Earth absorbs 3 parts of the force from an object due to its force of attraction and make the object to move on it by the rest 11 parts of the force. As a result the object accelerates on the Earth by the 11 parts of the force .

Every body moves in rotations, and every rotation is a bit of action.

So the acceleration due to gravity of an object is 11m/s² on the Earth in every bit of action .

CONCLUSION

It is obvious that ,

ACTION OF CENTRIPETAL FORCE :

REACTION OF CENTRIFUGAL FORCE

= 56 : 44 = 42 : 33 = 28 : 22 = 14 : 11

Earth is taken as the base for any calculation of any other celestial body .

The above ratios are equal to one another but the digits of each ratio are different from the digits of any other ratio .Each ratio is obtained from the rotation of a wheel on the Earth .

So the rotation of a wheel on any Satellite, on any Planet and on any star is same .

Hence the above ratio is same in any Satellite, in any Planet and in any star.

But when the action and reaction ratios of any two celestial bodies are compared then the bigger digits ratio is taken for the bigger mass celestial body and the smaller digits ratio is taken for the smaller mass celestial body .

Because the amount of masses of the celestial bodies are calculated in bigger and in smaller digits according to their shape and size.

The acceleration due to gravity of the Moon is (1/6)th part of the Earth .

So the following equation is applicable to the Moon ,

$$(14/6) \text{ part Action} = (11/6) \text{ part Reaction} + (3/6) \text{ part Absorption}$$

This implies that ,To every (14/6) part of Action , there is (11/6) part of Reaction and (3/6) part of Absorption on the Moon.

So the **acceleration due to gravity of the Moon is $(11/6) \text{ m/s}^2 = 1.83 \text{ m/s}^2$**

The acceleration due to gravity of a celestial body depends upon its mass, velocity and distance from the nearest celestial body .

ACTION OF CENTRIPETAL FORCE :

REACTION OF CENTRIFUGAL FORCE

= **14 : 11** in case of Earth

= **(14/6) : (11/6)** in case of Moon

Here the Earth’s ratio of action to reaction is equal to the Moon’s ratio of action to reaction but the action of Earth is not equal to the action of Moon and the reaction of Moon is not equal to the reaction of Earth .

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The followings are the published papers of the IJSER journal .

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IJSER , volume 10 , issue 12
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- 2) Nrusingh’s 2nd law
IJSER , volume 6 , issue 7
July-2015 , ISSN 2229-5518
- 3) Nrusingh’s 3rd law
IJSER , volume 11 , issue 3
March-2020 , ISSN 2229-5518

Figure	Caption	Meaning	Value
1	Cycloid	Cycloid is a curved path , that is traced out by a point on a circle, which rolls on a straight line .	$8r = \text{Length of the cycloid}$
2	Straight line	Length of the circumference of a circle = Length of the horizontal straight line	$2\pi r$
3	r	Radius of the circle	$2\pi r / 2\pi$
4	π	(Circumference of a circle/diameter)	$22/7 = 3.14159$
5	Circle	A circle is a locus of a point whose distance from a fixed point is constant	