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HEAT ENERGY = (11/14) TEMPERATURE

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ABSTRACT :

The heat of an object is the total energy of all the molecular motion inside that object .Temperature is the measure of the average heat of the molecules in a substance.

The combined relation of volume , pressure and temperature of a given mass of gas can be derived from the combining law of (Boyle's law as well as Charle's law) , (Boyle's law as well as Gay Lussac's law) and (Charle's law as well as Gay Lussac's law). The combined relation of pressure, volume and temperature of a given mass of gas can be derived from the motion of a wheel. 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 on 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 OPPOSITE 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 ---- **Nrusingh's 8th law**

APPLIED HEAT = (3/14) ABSORBED HEAT + (11/14) WORK DONE HEAT

This implies that

Q = (3/14) U + (11/14) W ----- **Nrusingh's 11th law**

The following law is derived from Nrusingh's 5th law of general gas law

HEAT ENERGY = (11/14) TEMPERATURE ----- **Nrusingh's 13th law**

The above law implies that

THE HEAT ENERGY RADIATED FROM A MASS OF GAS IS DIRECTLY PROPORTIONAL TO ITS ABSOLUTE TEMPERATURE

The law implies that **Heat Energy ∝ Temperature**

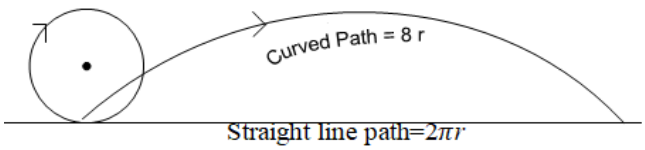
where (11/14) is the constant of proportionality

KEY WORDS :

Heat Energy, Temperature, Energy, Force, Distance, Pressure, Volume, Constant of proportionality, Absorption, Action, Reaction, Centripetal force, Centrifugal force, Cycloid path , Straight line path

INTRODUCTION :

When 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 the cycloid path by the centripetal force and Simultaneously the same point covers **2πr length** on the straight line path by the centrifugal force.

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 π r where r is the radius of the circle ,which generates the cycloid . The cycloid is a curved path, which is traced out by a point on a circle that rolls on a straight line.

Hence **8r > 2πr** => $s_1 > s_2$

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

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

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

So $v_1 > v_2$ => $mv_1 > mv_2$

$=> m\frac{dv_1}{dt} > m\frac{dv_2}{dt} => ma_1 > ma_2$

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

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

Hence $ma_1 > ma_2 => F_1 > F_2$

where 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.**

But here $F_1 > F_2$

=> $F_1 - F_2$ = **SOME ABSORBED FORCE**

=> $F_1 = F_2$ + **SOME ABSORBED FORCE**

Here F_1= **CENTRIPETAL FORCE**

= **ACTION FORCE**

And F_2 = **REACTION FORCE**

Hence **CENTRIFUGAL FORCE**

= F_2 + **SOME ABSORBED FORCE**

= **REACTION FORCE** +

SOME ABSORBED FORCE

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

This implies that,

ACTION = **REACTION + ABSORPTION**

SUBJECT MATTER :

The force is applied on a point of the wheel , So the point moves **8r length** on the cycloid path by the centripetal force and simultaneously the same point covers **2πr length** on the straight line path by the centrifugal force .

This implies that $F_1 : F_2$ =

ACTION OF CENTRIPETAL FORCE : REACTION OF CENTRIFUGAL FORCE

So $F_1 : F_2 = 8r : 2\pi r = 8 : 2\pi$

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

= 56 / 7 : 44 / 7 = 56 : 44 = 14 : 11

Hence $F_1 : F_2$ = 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 centripetal force as well as the 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 on the road .

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 .

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

Temperature is the average heat energy of the matter .Temperature is the degree of hotness or coldness of a body. Heat is the sum of the kinetic energy of atoms or molecules .Heat is the form of energy that transfers from a hot body to a cold body .

The heat energy is derived from the general gas law of volume ,pressure and temperature .

The general gas law is derived from the following various gas laws .

Boyle's law states that ,

The volume of given mass of a gas is inversely proportional to its pressure at constant temperature

Mathematically, Boyle's law can be expressed as follows

Volume ∝ 1/ Pressure ----------(4)

Charle's law states that,

Pressure remaining constant, the volume of the given mass of a gas is directly proportional to its Kelvin temperature .

Mathematically,

Charle's law can be expressed as follows

Volume ∝ Temperature ----------(5)

Gay Lussa's law states that,

The pressure of given mass of a gas is directly proportional to its Kelvin temperature at constant volume

Mathematically, Gay Lussac's law can be expressed as follows

Pressure ∝ Temperature ----------(6)

CASE –I

Combining law of Boyle and Charle .

Boyle's law states that

Volume ∝ 1/ Pressure ----------(4)

And Charle's law states that

Volume ∝ Temperature----------(5)

So combining the laws of (4) and (5)

It is obtained that ,

Volume ∝ (Temperature / Pressure)

=>Pressure ∝ (Temperature / Volume)

where **Volume = V , Pressure = P**

and **Temperature = T**

Here Pressure ∝ T / V

=> Force/Area ∝ T / V

Since Force / Area = Pressure

Now **Force / Area ∝ T / V**

=> **Force ∝ Area (T / V)**

=> **Force = k * Area (T / V)**

Since (11/14) part of force is used only for the working purpose out of the 1 part of the applied force and the rest (3/14) part of the force is absorbed in the medium .

Hence for the working purpose of force,

The constant of proportionality = k

And k = (11/14)

Hence **Force = k * Area (T / V)**

=> **Force = (11/14) * Area (T / V)**

=> **Force/Area = (11/14) (T / V)**

=> **Pressure = (11/14) (T / V)**

=> **Pressure * V = (11/14) T**

=> **Pressure * Volume**

= (11/14) Temperature

So the combining law of Boyle and Charle states that

PRESSURE * VOLUME

= (11/14) TEMPERATURE

This implies that **P V = (11/14) T**

CASE -II

Combining law of Boyle & Gay Lussac .

Boyle's law states that

Volume ∝ 1/ Pressure

The converse of this statement is also true,

So **Pressure ∝ 1/ Volume -------(4)**

And Gay lussac's law states that

Pressure ∝ Temperature -----(6)

So combining the laws of (4) and (6)

It is obtained that ,

Pressure ∝ Temperature / Volume

Since **Pressure = Force/Area**

So **(Force/Area)∝ Temperature/Volume**

=> **Force ∝ Area(Temperature /Volume)**

This implies that **Force ∝ Area (T / V)**

=> **Force = k * Area (T / V)**

Since (11/14) part of force is used only for the working purpose and the rest (3/14) part of the force is absorbed in the medium out of 1 part of the force.

So constant of proportionality= k=11/14

Hence **Force = k * Area (T / V)**

=> **Force = (11/14) Area (T / V)**

=> **Force/Area = (11/14) (T / V)**

=> **Pressure = (11/14) (T / V)**

=> **Pressure * Volume**

= (11/14) Temperature

So the Combining law of Boyle and Gay Lussac states that

PRESSURE * VOLUME

= (11/14) TEMPERATURE

This implies that **P V = (11/14) T**

CASE -III

Combining law of Charle and Gay Lussac .

Charle's law states that

Volume ∝ Temperature

The converse of this statement is also true,

So **Temperature ∝ Volume -------(5)**

And Gay Lussac's law states that

Pressure ∝ Temperature

The converse of this statement is also true,

So **Temperature ∝ Pressure -----(6)**

Hence combining the laws of (5) and (6) , it is obtained that

Temperature ∝ Volume * Pressure

The converse of this statement is also true,

So **Pressure * Volume ∝ Temperature**

=>**Pressure ∝ (Temperature/Volume)**

=>**(Force/Area) ∝ Temperature/Volume**

Since Force / Area = Pressure

=>**Force ∝ Area*(Temperature/Volume)**

=> **Force ∝ Area * (T/ V)**

=> **Force = k * Area (T/ V)**

Since (11/14) part of force is used only for the working purpose out of the 1 part of the applied force and simultaneously the rest (3/14) part of the force is absorbed in the medium.

Hence for the working purpose of force k = constant of proportionality = (11/14)

Hence **Force = k * Area (T / V)**

=> **Force = (11/14) Area (T / V)**

=> **(Force/Area) = (11/14) (T / V)**

=> **Pressure =**

(11/14)(Temperature / Volume)

Since Force / Area = Pressure

Hence **Pressure * Volume**

= (11/14) Temperature

So the combining law of Charle and Gay Lussac states that

PRESSURE * VOLUME

= (11/14) TEMPERATURE

This implies that **P V = (11/14) T**

All the three combining laws of (**Boyle's law** as well as **Charle's law) , (Boyle's law** as well as **Gay Lussac's law)**

And (**Charle's law** as well as **Gay Lussac's law)** state that

PRESSURE * VOLUME

= (11/14) TEMPERATURE

This implies that **P V = (11/14) T**

This is the general gas law of volume, pressure and temperature of a given mass of gas .

Nrusingh's 5th law states that

Pressure * Volume = (11/14) Temperature

=> **PV = (11/14) T** => **P = (11/14) T/ V**

Since Pressure =

working pressure +Absorbing pressure

= (11/14)(T/V) + (3/14)(T/V)

Hence

(11/14) (T/V) part of Pressure is worked and the rest (3/14) (T/V) part of Pressure is absorbed out of 1 (T/V) part of pressure .

=> **working pressure=(11/14) T/V** ----(7)

Basically the absorbing pressure

(3/14) T/V is not taken into account .

Multiplying the factor **" Area "** both the sides of the equation (7)

It is obtained that ,

=> **Working pressure * Area**

= { (11/14) T/V } * Area

= (11/14) Area * Temperature / Volume

Since **Working pressure * Area**

= **Working force**

So **Working Force**

= (11/14) Area * Temperature / Volume

Here **Area =(Length * Breadth)** and **Volume =(Length * Breadth * Height**)

Hence Length, Breadth and Height are the distances along the X-axis ,Y-axis and Z-axis respectively in the three dimensional space .So the Height is a distance along the Z-axis

Suppose Working Force = Force

Hence **Force**

= (11/14) Area (Temperature / Volume)

= (11/14) (Area *Temperature) / Volume

=(11/14)(Length*Breadth)Temperature

/ (Length * Breadth *Height)

Hence Force =

=(11/14)(Length*Breadth)Temperature/

(Length * Breadth) * Height ----------(7)

Cancelling the factor (Length*Breadth) from the right hand side numerator and denominator of the equation (7)

it is obtained that,

Force = (11/14) Temperature / Height

=> **Force* Height = (11/14) Temperature**

Since Height is a distance on Z- axis

i.e. Height = Distance

So **Force*Height = (11/14)Temperature**

=>**Force * Distance=(11/14) Temperature**

As **Force*Distance=Work done=Energy**

So **Force * Distance = Energy**

Hence **Force * Distance =**

(11/14) Temperature

=> **Energy = (11/14) Temperature**

Since **Temperature is the average heat energy of the matter.**

So **Energy = Heat Energy**

Hence **Energy = (11/14) Temperature**

=> **Heat Energy**

= (11/14) Temperature

So the law of **Heat Energy**

= (11/14) Temperature is derived from the following general gas law

PRESSURE * VOLUME

= (11/14) TEMPERATURE

Hence the sun is radiating heat energy according to the law **Heat Energy**

= (11/14) Temperature

Five atoms of Hydrogen gas are fused together to form one atom of Helium gas in the sun .

Atomic weight of 5 hydrogen atoms

5H = 5(1.008) = 5.040 and

Atomic weight of 1 Helium atom =

1He = 4.002 ≈ 4 = 2 protons + 2 neutrons

So Fusion in Sun takes place according to the following Nrusingh's 2nd law

1 PART ACTION

= (11/14) PART REACTION

+ (3/14) PART ABSORPTION

Fusion of 5 Hydrogen atoms = 1 part of Action and Product of 1 Helium atom = (11/ 14) part of Reaction.This implies that,

(11/14) PART REACTION

= 5.040(11/14) = 3.960 ≈ 4 ≈ 4.002

= Atomic weight of 1 Helium atom

and **(3/14) PART ABSORPTION**

= 5.040(3/14) = 1.080

= Absorbed atomic weight in the sun

This implies that,

when 5 hydrogen atoms of atomic weight 5.040 are fused together in the Sun , then 3.960 ≈ 4 = atomic weight of 1 helium atom is produced and simultaneously the rest 1.080 atomic weight is absorbed in the Sun .

Hence 3.960 ≈ 4 = atomic weight of 1 Helium atom gas is radiated as heat as well as light energy and simultaneously the rest 1.080 atomic weight is absorbed in the Sun out of 5.040 atomic weight of 5 hydrogen atoms .

The light and heat energy go together because light is emitted from a matter in the fixed temperature of it .

So heat energy is radiated from the Sun by the following law ,

Heat Energy

= (11/14) Temperature

CONCLUSION :

Heat Energy = (11/14) Temperature

Here (11/14) is the constant of proportionality.

So this implies that **Heat Energy**

∝ Temperature

This implies that,

The heat energy radiated from a given mass of gas is directly proportional to its absolute temperature in the Sun .

REFFERENCES :

The followings are the published papers of the IJSER journal - **ISSN 2229-5518** and the GSJ journal -**ISSN 2320-9186**

1) Nrusingh's 1st law
IJSER,volume-10 ,issue-12, December-2019

2) Nrusingh's 2nd law
IJSER , volume-6 , issue -7, July-2015

3) Nrusingh's 3rd law
IJSER , volume-11 , issue- 3, March-2020

4) Nrusingh's 4th law
GSJ ,volume-8, issue-9, September-2020

5) Nrusingh's 5th law
GSJ ,volume-8, issue-12, December-2020

6) Nrusingh's 6th law
GSJ ,volume-8 ,issue-12, December-2020

7) Nrusingh's 7th law
GSJ , volume-9, issue-01, January-2021

8) Nrusingh's 8th law
GSJ ,volume-9 , issue-01, January-2021

9) Nrusingh's 11th law
GSJ ,volume-9, issue-02, February-2021

10) Nrusingh's 12th law
GSJ ,volume-9, issue-04, April-2021