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Paper # Applied Physics

Exam # Summer

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ID # 15863

Q No 1 :-> A body's temperature is 143.4° C. What is the temperature in Kelvins?

Ans :->

Given Data :->

Temperature 143.4°C

Required

Temperature in Kelvins

Solution

We Known temperature in Kelvin are equal

$T_K = T_C + 273.15$

$143.4 + 273.15$

416.55 Kelvin

Q No :-> 2 An item has temperature of 2596 degree k. What is its temperature in Celsius.

Ans

Given Data

Temperature 2596 degree Kelvin

Required :

Temperature in Celsius.

Solution :

We know that

Celsius = Kelvin - 273

°C = 2596 - 273

°C = 2323

So 2596 Kelvin = 2323 Celsius.

Q No 8.1
(a) part3

An item has a mass of 4.76g and volume $0.54cm^3$ calculate its density?

Ans :→ Given Date

mass = 4.76g
volume = $0.54 cm^3$

Required Date:

Solution:

We Know that

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

$$\text{Density} = \frac{4.76g}{0.54cm^3}$$

$$\text{Density} = 8.814g/cm^3$$

Q I Part (b)

Convert the following

1 :→ 257,600 meters to kilometers.

Ans:→ The Length in Kilometer = $\frac{\text{Meter}}{1000}$

$\frac{257,600}{1000}$ = 257.6 kilometer.

2- 58,300 milliliter to liters.

Ans:→ Liter = $\frac{\text{milliliter}}{1000}$ = $\frac{5830}{1000}$ = 58.3 liters.

3- 87.421 Centimeters to meters.

Ans:→ Meter = $\frac{\text{Centimeter}}{100}$ = $\frac{87.421}{100}$ = 874.21 meters

4- 869 kilogram to grams.

Ans:→ We Know 1kg = 1000 gram

⇒ 869 kg = 869 × 1000g

⇒ 86900 gram

5- 10^4 milligram to Gram.

Ans:→ 10000 gram

gram = $\frac{\text{milligram}}{1000}$ ⇒ $\frac{10000}{1000}$ = 10 g.

Q No 2 (Part e)

a) Distance and displacement speed and average speed positive acceleration and Negative acceleration give example of each case.

Ans :-> Distance :-

1) Length of actual path travelled by an object.

2) It is a scalar quantity.

3) It remains positive, can't be '0' or negative.

4) Distance can be equal to displacement or its greater than displacement.

Displacement :->

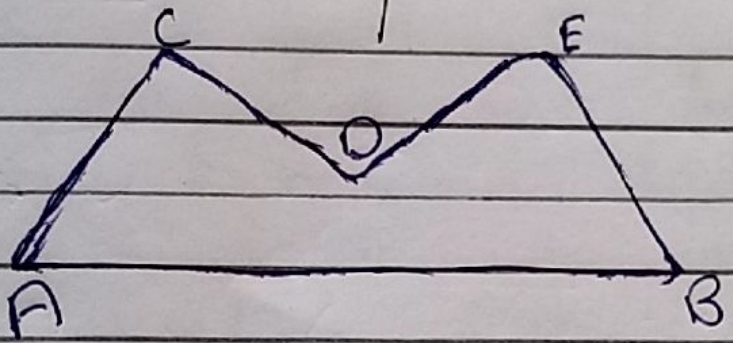
1) Shortest length between intial and final position of an object

(2) it is a vector quantity.

(3) it can be positive (+ve) negative (-ve) or zero.

(4) Displacement can be equal to distance or its lesser than distance.

Example of distance and displacement.



AB is Displacement
ACDE is the distance.

Speed:

Speed being a scalar quantity is the rate of which an object covers distance.

$$\text{Speed} = \frac{\text{distance covered}}{\text{time taken}}$$

$$V = \frac{S}{T}$$

Example of Speed

you drive a car of 20 m/s
your Speed is 20m/s

Average Speed

The average Speed of an object is defined as the total distance travelled, divided by the total time elapsed

Average Speed = $\frac{\text{total distance}}{\text{total time}}$

$V = \frac{d}{T}$

Example of Average Speed

If a distance of 80 kilometer Cover by car In 1 hour So the of average Speed is

80 kilometer Per hour.

Positive Acceleration :->

An increase in the velocity of an object during a given period of time.

Example

A bus or car moving with increasing speed has positive acceleration.

Negative Acceleration :->

A decrease in the velocity of an object during a given period of time.

Example :->

A car slowing down in backward direction.

Q No 2 Part (b)

(b) A car is moving with a velocity of 8m/s. The driver applies brakes and the car comes to Stop after convering 9. distance of 19m calculate its acceleration?

Ans :-

Give Data

$v_f = 8\ m/s$

$v_i = 0\ m/s$

$s = 19\ m$

$a = ?$

Solution :-

Using formula

$2as = v_f^2 - v_i^2$

Putting values

$2a\ (19) = (8)^2 - 0$

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$38a = 64$

$a = \frac{64}{38}$

$a = 1.68 \ m/s^2$

Q No :-> 3

Part (a)

(a) Describe in detail and Prove mathmatically first law and Secaund law of motion with giving an example for each law from our daily life?

Ans :-> Newton's first law of motion

Inertia an object will not change its motion unless acted on by unbleanced force.

- if it is at rest, it will stay at rest.
- if it is in motion, it will remain at the same velocity.

objects with a greater mass have more ~~Fate~~ Inertia. It take more force to change their motion.

Mathematically first law:

⇒ The first law can be stated mathematically as:

$$\sum F = 0 \Rightarrow \frac{dv}{dt} = 0$$

Example:

if you slide a hockey puck on ice, eventually it will stop because of friction on the ice. it will also stop if it hits something like a player's stick or a goal post.

Second Laws of motion:

The Acceleration of an object is directly proportional to the resultant force acting on an object and inversely proportional to its mass the objects

acceleration should be in the resultant force.

Mathmetically Second law::

Mathematically the relation can be expressed as:

$$\Sigma \vec{F} = \vec{ma}$$

Example::

The if you use the same force to push a truck and a car, the car will have more acceleration than the truck because the car has less mass.

Q No :-> 3

(Part B)

B) Explain third law of motion by deriving its equation in terms of mass and Acceleration. Give three example of this law from daily action of life?

Ans :-

Newton's third law of Motion

- According to newton's Third law whenever one body exerts a force on another body, the Secound body exerts on equal and opposite force on the first body.
- The force exerted by the first body on the Secound body is called action.
- The force exerted by the Secound body on the first body is called reaction.
- We can also say that newton's third law states that to every action there is an equal and there opposite reaction.

Derive an equation of third law of motion in term of mass and acceleration.

$F_1 = -F_2$

Become

$m_1 a_1 = -m_2 a_2$

Example ::

(1) When you jump off a small rowing boat into water you will push yourself forward the water, The same force you used to push forward the boat will make the boat move backwards

(2) When air rushes out of a ballon it flies up.

(3) When diving you drive off a board, you push

down on the Spring board.
The board is Spring back
and forces you into the
air.