



# WB/ KP SI & CONSTABLE



## GS-SCI

# PHYSICS AND IT'S CALCULATION

BY SOUMI MAHENDRAS



LIVE

| 06:15 PM



# PHYSICS





# WORK

## Definition

Work is said to be done when a force applied to an object moves that object.

## Formula

We can calculate work by multiplying the force by the movement of the object.

$$W = F \times d$$

## Unit

The SI unit of work is the joule (J)

# ENERGY

<b>Definition</b>	In physics, we can define energy as the capacity to do work.
<b>Formula</b>	For the potential energy the formula is $P.E. = mgh$
<b>Unit</b>	The SI unit of energy is joules (J), which is named in honour of James Prescott Joule.



# POWER

## Definition

Power can be defined as the rate at which work is done i.e. energy converted.

## Formula

The formula for power is  
 $P = W/t$

## Unit

The unit of power is watt (W).

## What is Work?

Work is said to be done when a body or object moves with the application of external force. We can define work as an activity involving a movement and force in the direction of the force.

**Q.1. If a force of 30 newtons (N) pushing an object 3 meters in the same direction of the force, find out the amount of work has done?**

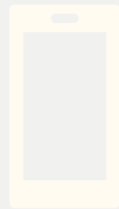
**Work = Force × Displacement = F × d**

**Unit of Work**

**If a force of 5 newtons is applied to an object and it moves 20 cm, find out the amount of work has done?**

## Example of work

A football has been kicked with a 100 N force creating an angle of 45 degree from the ground. Find out the amount of work done by the force in moving the object through a distance of 8 m





## What is Energy?

Energy is the ability to perform work. Energy can neither be created nor destroyed. It can only be transformed from one kind to another. The unit of Energy is same as of Work i.e. Joules. Energy is found in many things and thus there are different types of energy.

All forms of energy are either kinetic or potential. The energy in motion is known as Kinetic Energy whereas Potential Energy is the energy stored in an object and is measured by the amount of work done.

## What is Power?

Power is a physical concept that has several different meanings, depending on the context and the information that is available. We can define power is the rate of doing work.

It is the amount of energy consumed per unit time.

## Formula of power

As discussed power is the rate of doing work. Therefore, it can be calculated by dividing work done by time. The formula for power is given below.

$$P=W/t$$

Where,

P = Power

W = Work done

T = Time taken

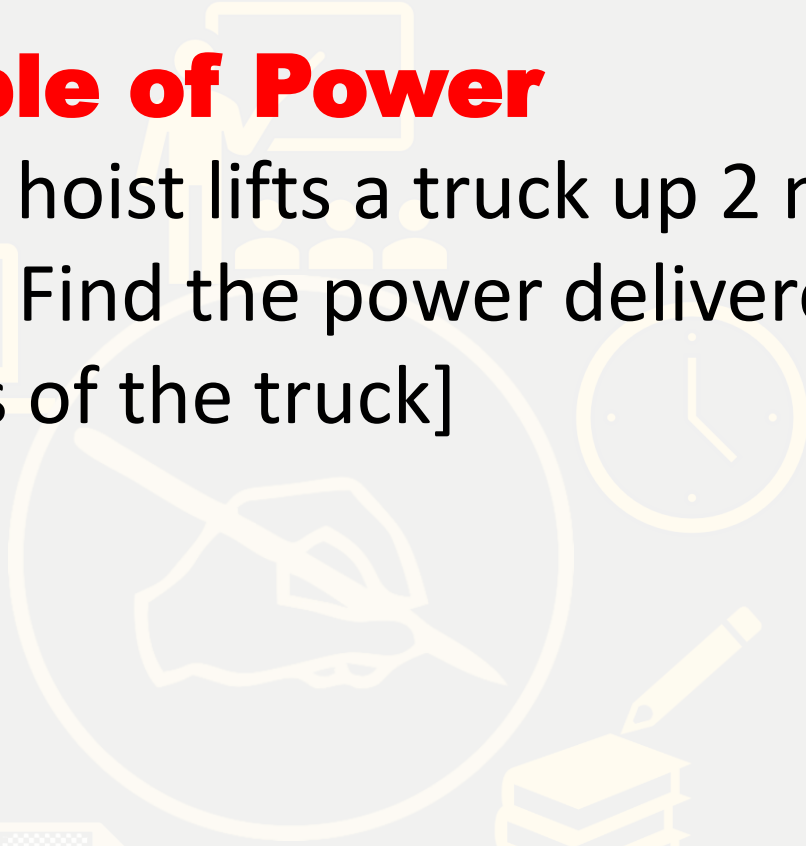
## Unit of Power

As power doesn't have any direction, it is a scalar quantity.

The SI unit of power is Joules per Second (J/s), which is termed as Watt. Watt can be defined as the power taken to do one joule of work in one second. The unit Watt is dedicated in honour of So James Watt, the developer of the steam engine.

## Example of Power

A garage hoist lifts a truck up 2 meters above the ground in 15 seconds. Find the power delivered to the truck. [Given: 1000 kg as the mass of the truck]

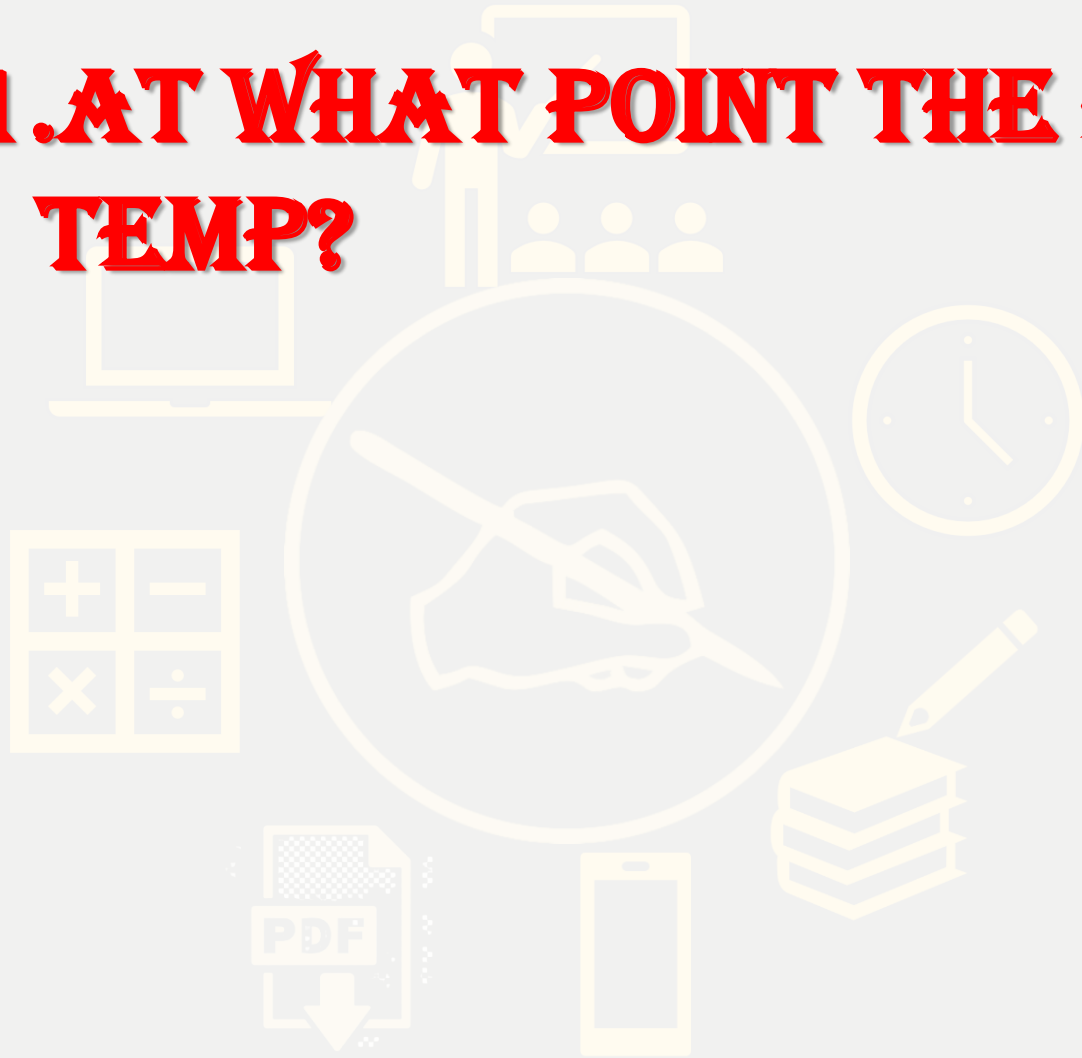




# HEAT AND TEMPERATURE

$$C/5 = F - 32/9$$

# 1. AT WHAT POINT THE F TEMP IS DOUBLE OF C TEMP?



**2. AT WHAT TEMP, C AND F READING WILL BE SAME?**

**3. A MEASURED TEMP IN F SCALE IS 200 DEGREE F WHAT WILL BE IT'S VALUE IN C SCALE?**





4. THE VALUE OF 40 DEGREE C IN F SCALE IS \_\_\_\_\_
5. THE VALUE OF 50 DEGREE IN F SCALE IS \_\_\_\_\_



## **The fundamental Principle in Physics:**

1. Matter can neither be destroyed nor created but it can be transformed from one state to another.
2. The smallest Unit of an element is called Atom.
3. The simplest form of matter which can retain complete physical and chemical Properties.
4. The force of attraction between similar kind of molecules is called Force of cohesion.
5. The force of attraction between different kind of molecules is called Force of adhesion.

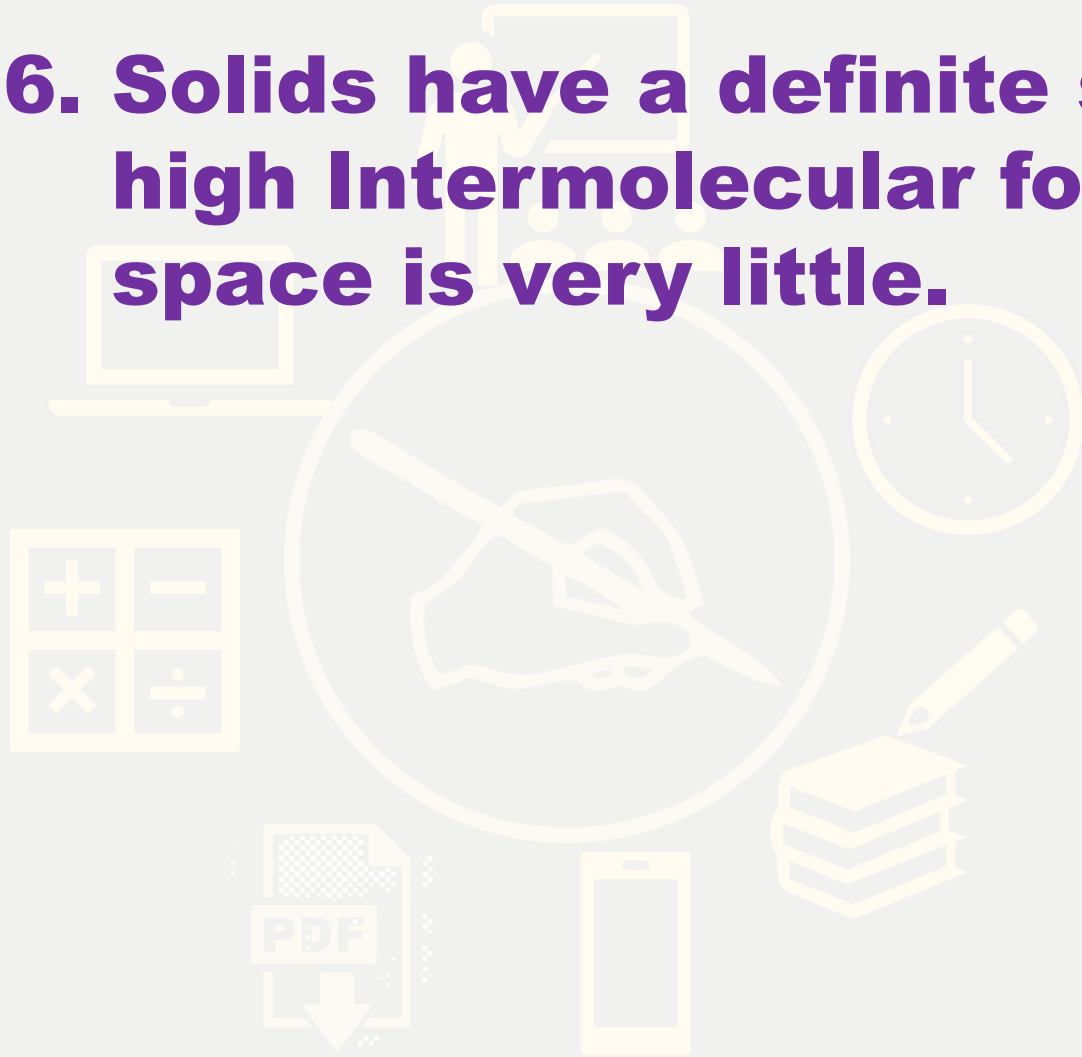
**Intermolecular** literally means "between molecules".

**Intermolecular space** is the distance between molecules.

**Intermolecular forces (IMF)** are the **forces** which mediate interaction between molecules, including **forces of attraction** or repulsion which act between molecules and other types of neighboring particles.



**6. Solids have a definite shape and size because of high Intermolecular forces as the Intermolecular space is very little.**



**7. Liquids have only definite volume but no definite shape as the Intermolecular forces are less as the Intermolecular space is large.**



**8. Gases have no definite shape and volume as the Intermolecular forces are negligible as the Intermolecular spaces are very large.**



**Stress** is defined as the restoring force per Unit Area The restoring force is equal in magnitude and opposite in direction to the applied force also known as deforming force.

**Surface Tension** is defined as the tension of the surface film of a liquid caused by the attraction of the particles in the surface layer by the bulk of the liquid, which tends to minimize surface area.

Temperature Increases ----- Surface Tension Decreases

**Viscosity** is defined as the state of being thick, sticky, and semi-fluid in consistency, due to internal friction.

Temperature Increases ---- Viscosity Decreases





# LIGHT

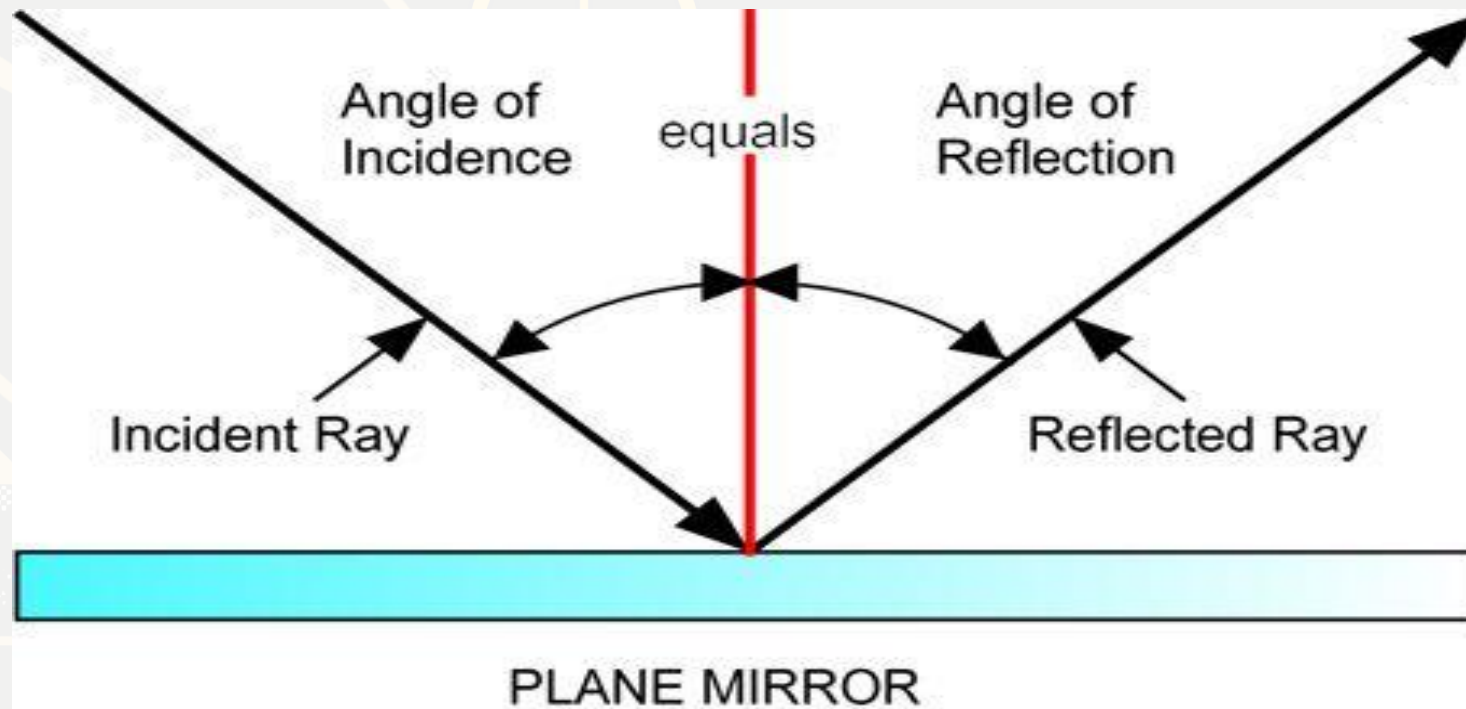
The speed of light in vacuum is 299,792,458 meters per second.

The medium through which light can pass easily is transparent medium.

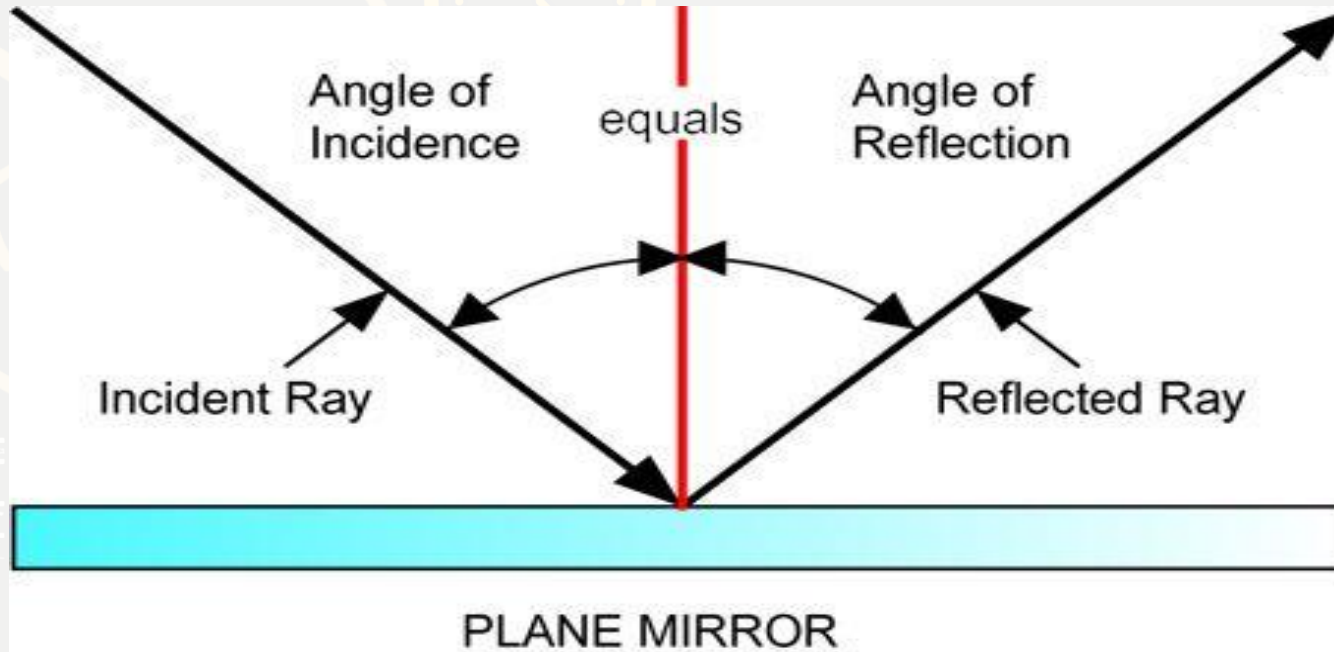
The medium through which light can pass partially is translucent medium.

The medium through which light cannot pass is opaque medium.

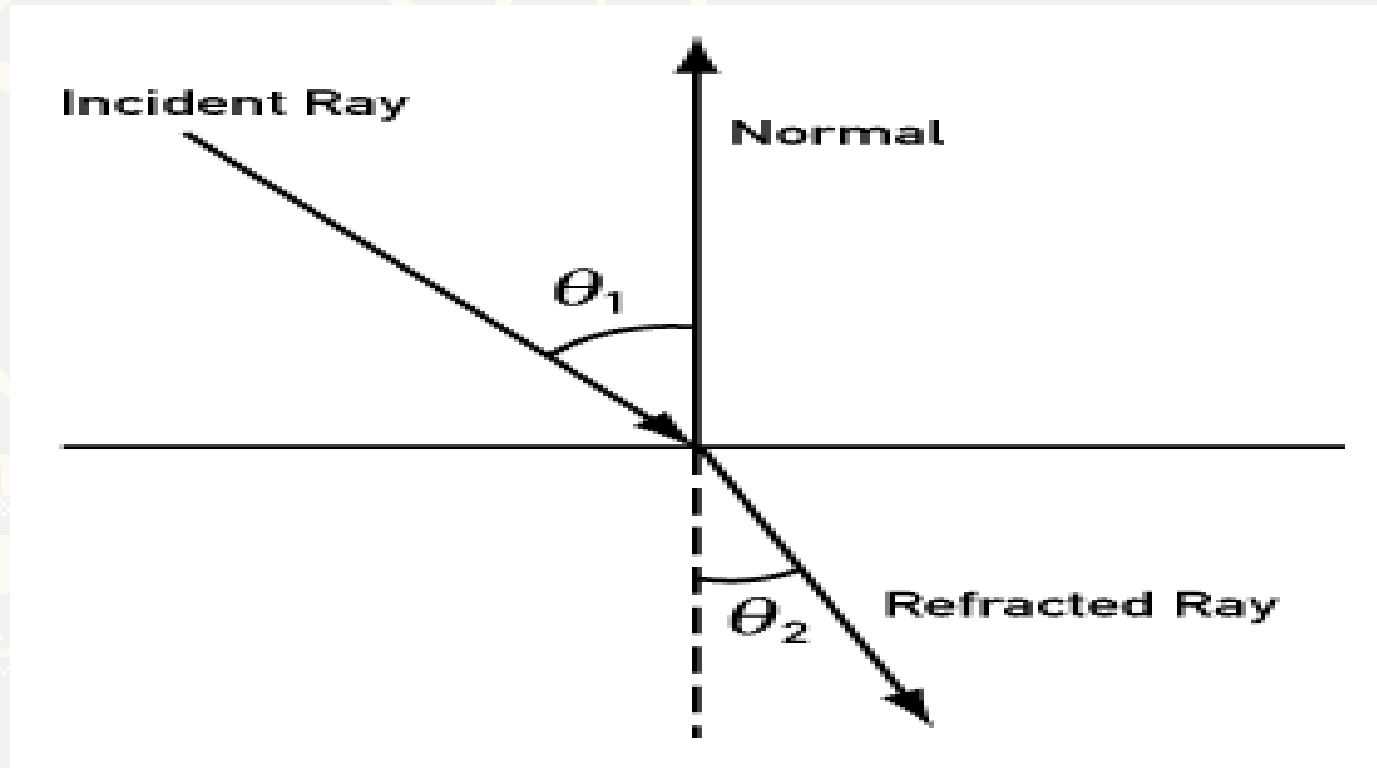
**Incident Ray-** The ray of light which strikes the surface of a medium before reflecting back.



**Reflected Ray-** The ray of light which strikes back from the medium after reflection is called reflected ray.



**Refracted Ray-** The ray of light which that is transmitted into the second medium and travels in a different direction than the incident ray.

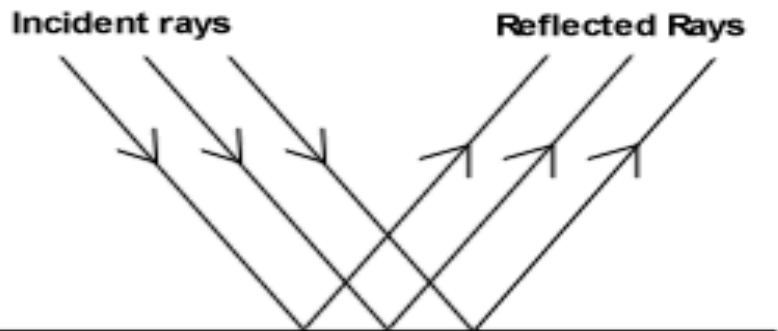


**Two Laws of Reflection-** Angle of Incidence is equal to the angle of reflection Incident Ray, Reflected Ray and the Normal drawn to the point of incidence all lie in the same plane.

**Diffused Reflection-** When all parallel incident rays reflected from a plane surface are not parallel, it is diffused reflection.

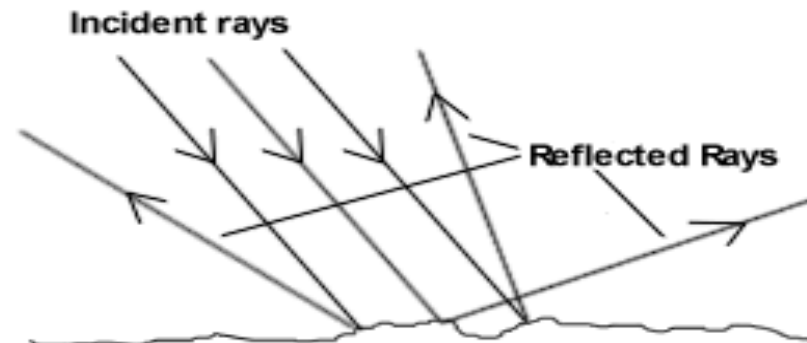
**DIFFUSE REFLECTION** is the **reflection** of light or other waves or particles from a surface such that a ray incident on the surface is scattered at many angles rather than at just one angle as in the case of specular **reflection**. ... Many common materials exhibit a mixture of specular and **diffuse reflection**.

### Regular Reflection



Eg. plane mirror or any other surface that produces a reflected image.

### Diffuse Reflection



This is like any surface that we can see but does not reflect an image

**1.1Byte is equal to:**

**a) 2 bits**

**b) 8 bits**

**c) 16 bits**

**d) 32 bits**

**2.The unit used internationally for measuring the volume of crude oil is:**

**a) Litre**

**b) Gallon**

**c) Barrel**

**d) US gallon**

**3.A barrel of crude oil is equal to:**

- 1) 42 US gallon**
- 2) 159 Litre**
- 3) 100 Litre**
- 4) 25 US gallon**

**a) Only 1**

**c) 1 and 2 Only**

**b) Only 2**

**d) 3 and 4 Only**



**4. 18 Carat gold is:**

**a) 50% gold and 50% impurity**

**b) 75% gold and 25% impurity**

**c) 100% gold**

**d) 60% and 40% impurity**

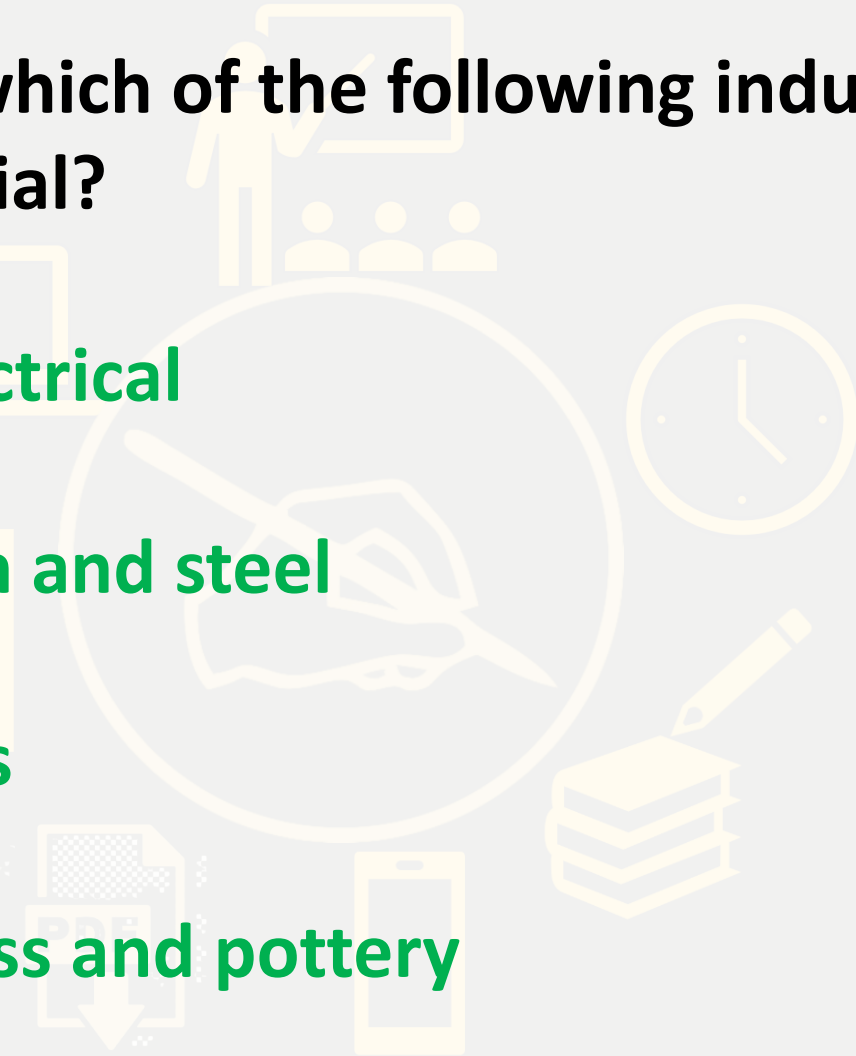
5. In which of the following industries is mica used as a raw material?

a) Electrical

b) Iron and steel

c) Toys

d) Glass and pottery



Thank  
you

