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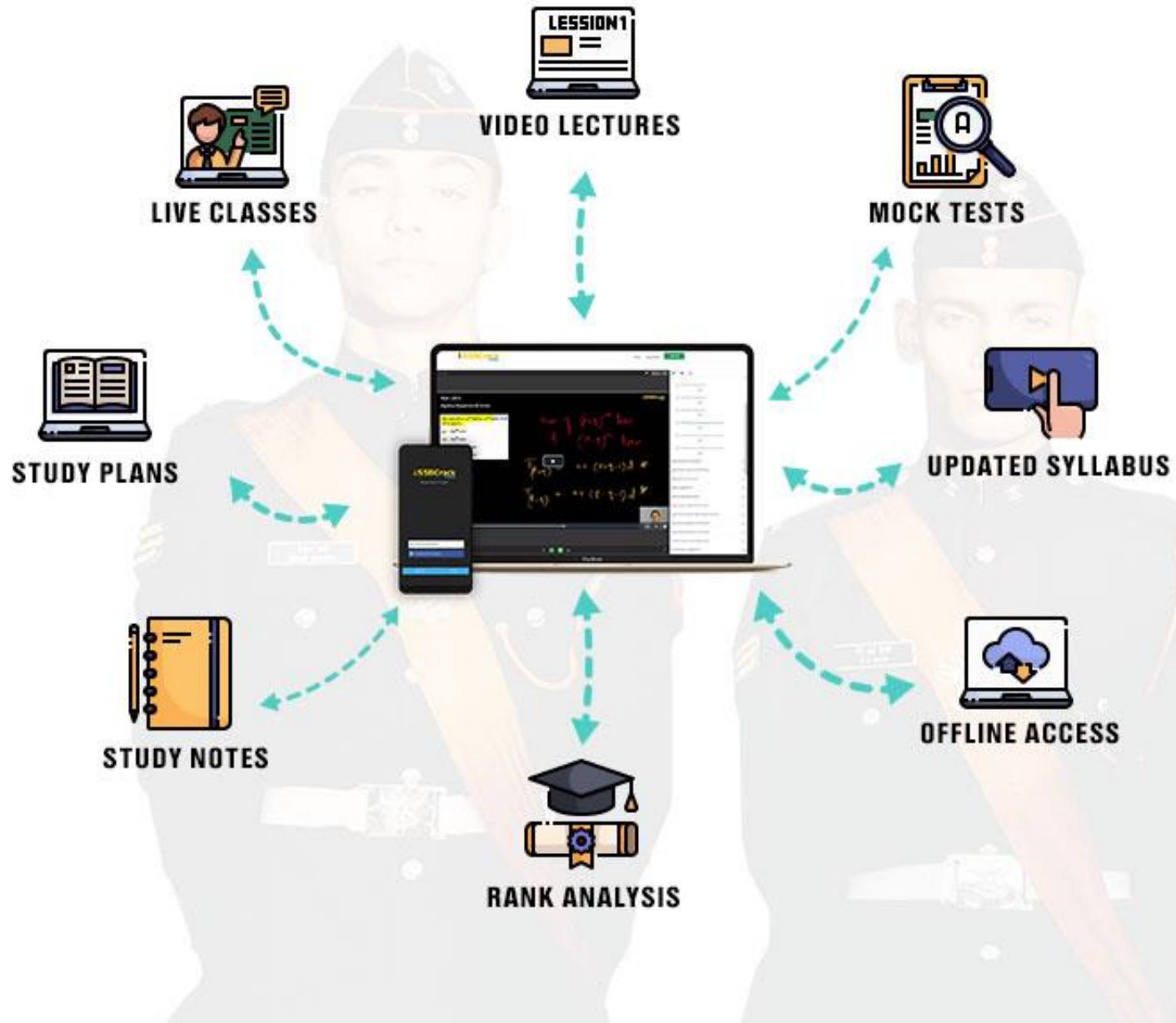
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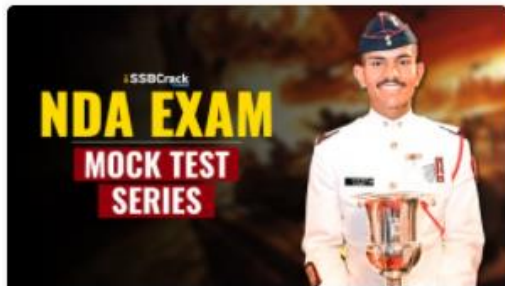
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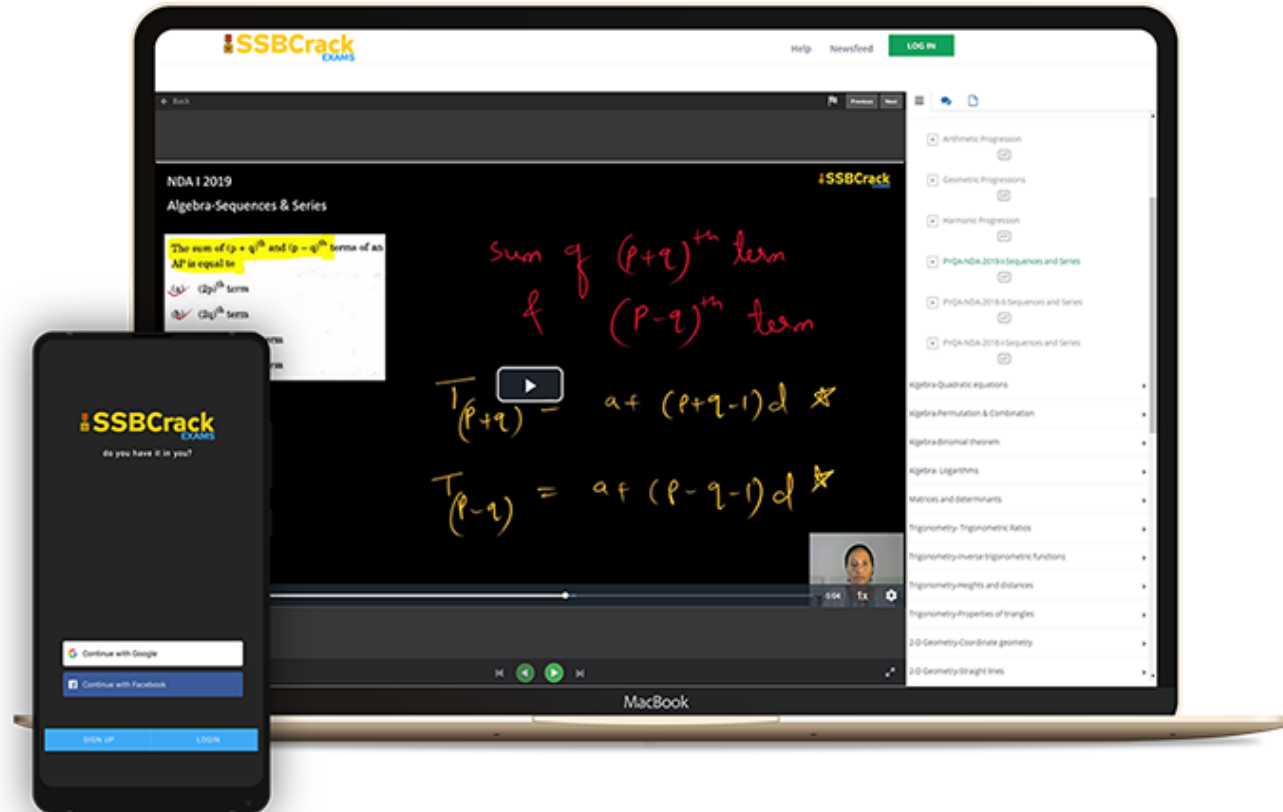


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TIME TABLE

DATE	TIME	SUBJECT
17 AUG 2022	10 AM TO 1 PM	General Awareness Part 1
17 AUG 2022	2 PM TO 5 PM	English Part 1
17 AUG 2022	6 PM TO 9 PM	Static GK Part 1
18 AUG 2022	10 AM TO 1 PM	General Awareness Part 2
18 AUG 2022	2 PM TO 5 PM	English Part 2
18 AUG 2022	6 PM TO 9 PM	Static GK Part 2
19 AUG 2022	10 AM TO 1 PM	Current Affairs
19 AUG 2022	2 PM TO 5 PM	English Part 3
19 AUG 2022	6 PM TO 9 PM	Defence Current Affairs
20 AUG 2022	10 AM TO 1 PM	Numerical Ability Part 1
20 AUG 2022	2 PM TO 5 PM	Reasoning Part 1
20 AUG 2022	6 PM TO 9 PM	General Sciences
22 AUG 2022	10 AM TO 1 PM	Numerical Ability Part 2
22 AUG 2022	2 PM TO 5 PM	Reasoning Part 2
23 AUG 2022	10 AM TO 1 PM	Numerical Ability Part 3
23 AUG 2022	2 PM TO 5 PM	Reasoning Part 3



Q) A body whose speed is constant

- (a) Must be accelerated
- (b) Might be accelerated
- (c) Has a constant velocity
- (d) Cannot be accelerated.

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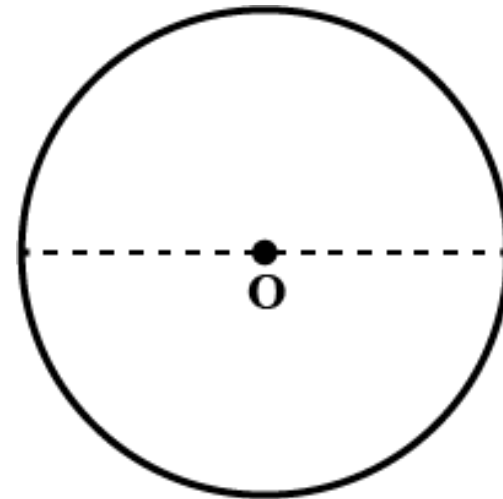
If a body with constant speed is travelling in the same direction(i.e., it is not changing its direction) then its velocity is constant and so its acceleration will be zero. But if the object is changing its direction, then its velocity is also changing and so it possesses the acceleration .

Q) A particle is moving in a circle of diameter 20 m. What is its distance and displacement as per the table given below

S.no	Rounds	Displacement	Distance
1	1		
2	1.5		
3	2		
4	2.5		

Q) A particle is moving in a circle of diameter 20 m. What is its distance and displacement as per the table given below

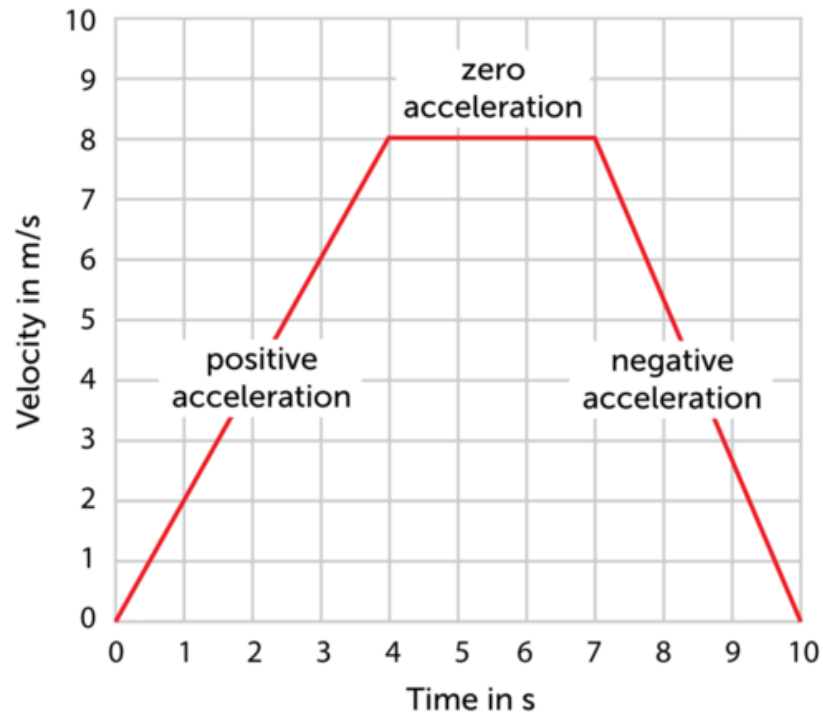
S.no	Rounds	Displacement	Distance
1	1	0	20π
2	1.5	20 m	30π
3	2	0	40π
4	2.5	20m	50π



After every round, particle comes to its starting position. So, displacement at full rounds will be zero

- Q)** An object moves with uniform positive acceleration. Its velocity-time graph will be
- (a) A straight line parallel to the time axis
 - (b) A straight line inclined at an obtuse angle to the time axis
 - (c) A straight line inclined at an acute angle to the time axis
 - (d) None of these

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 - (d) None of these



Q) Which of the following statement about speed is correct?

(a) $30 \text{ m/s} > 30 \text{ km/h}$

(b) $30 \text{ m/s} < 30 \text{ km/h}$

(c) $30 \text{ m/s} = 30 \text{ km/h}$

(d) None of these

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(c) $30 \text{ m/s} = 30 \text{ km/h}$

(d) None of these

$$1 \text{ m} = \frac{1}{1000} \text{ km}; 1 \text{ sec} = \frac{1}{3600} \text{ hr}$$

$$1 \text{ m/sec} = \frac{\frac{1}{1000}}{\frac{1}{3600}} \text{ km/hr} = \frac{3600}{1000} \text{ km/hr} = \frac{18}{5} \text{ km/hr}$$

Q) What does the speedometer of a car measure?

(a) average speed

(b) acceleration

(c) instantaneous speed

(d) None of these

Q) What does the speedometer of a car measure?

(a) average speed

(b) acceleration

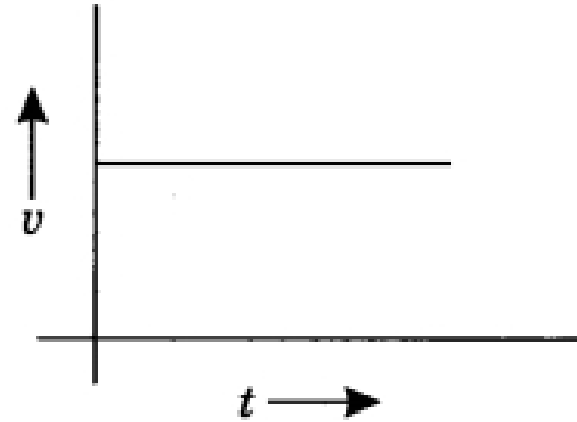
(c) instantaneous speed

(d) None of these

You see on the speedometer of a car is the speed at that instant or moment – the instantaneous speed.

Q) From the given $u - t$ graph, it can be inferred that the object is

- (a) in uniform motion
- (b) at rest
- (c) in non-uniform motion
- (d) moving with uniform acceleration



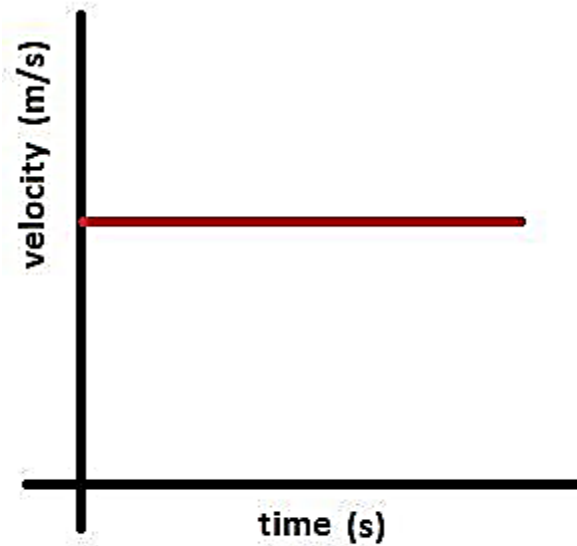
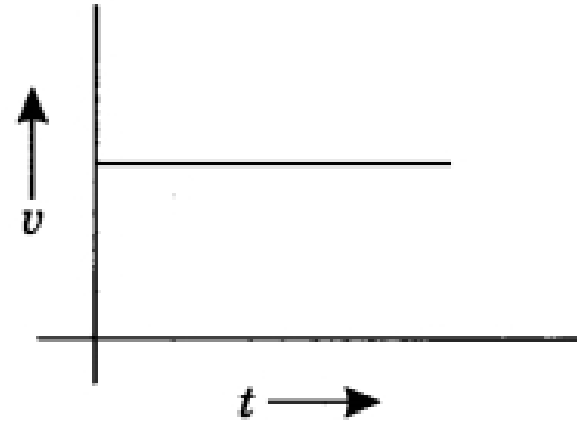
Q) From the given $u - t$ graph, it can be inferred that the object is

(a) in uniform motion

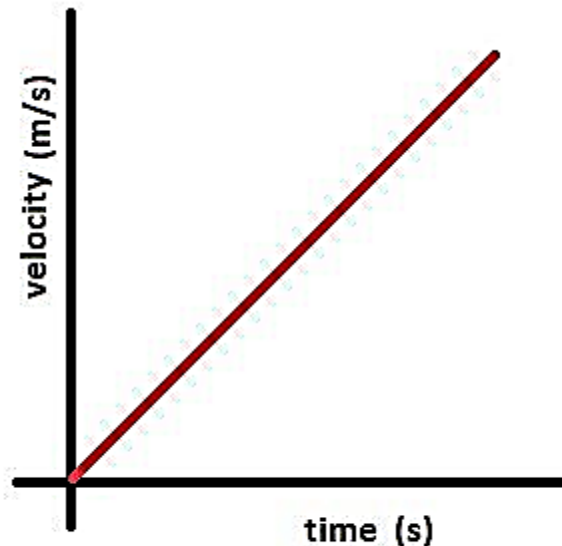
(b) at rest

(c) in non-uniform motion

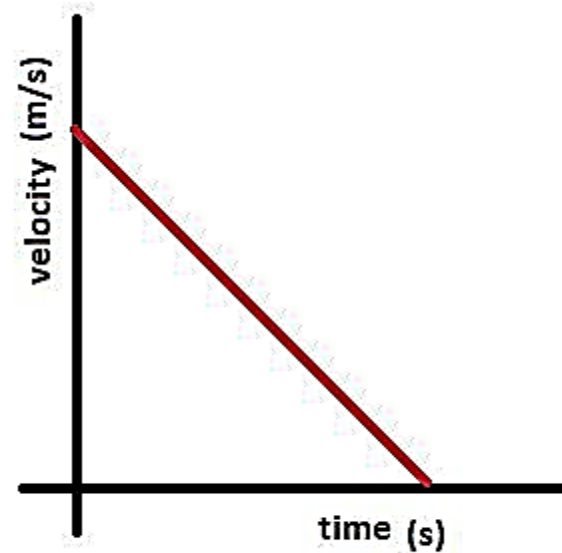
(d) moving with uniform acceleration



a) Velocity time graph for Uniform Motion.



b) Velocity time graph for uniformly accelerated motion



c) Velocity time graph for uniformly retarded motion

- Q)** Suppose a boy is enjoying a ride on a merry-go-round which is moving with a constant speed of 10 ms^{-1} . It implies that the boy is
- (a) at rest
 - (b) moving with no acceleration
 - (c) in accelerated motion
 - (d) moving with uniform velocity

Q) Suppose a boy is enjoying a ride on a merry-go-round which is moving with a constant speed of 10 ms^{-1} . It implies that the boy is

(a) at rest

(b) moving with no acceleration

(c) in accelerated motion

(d) moving with uniform velocity



The boy is moving constantly at a speed of 10 m/s and since the direction is not the same therefore the boy is moving at an accelerated motion. The rate at which the velocity changes is called acceleration.

Q) Area under a u - t graph represents a physical quantity which has the unit

(a) m^2

(b) m

(c) m^3

(d) ms^{-1}

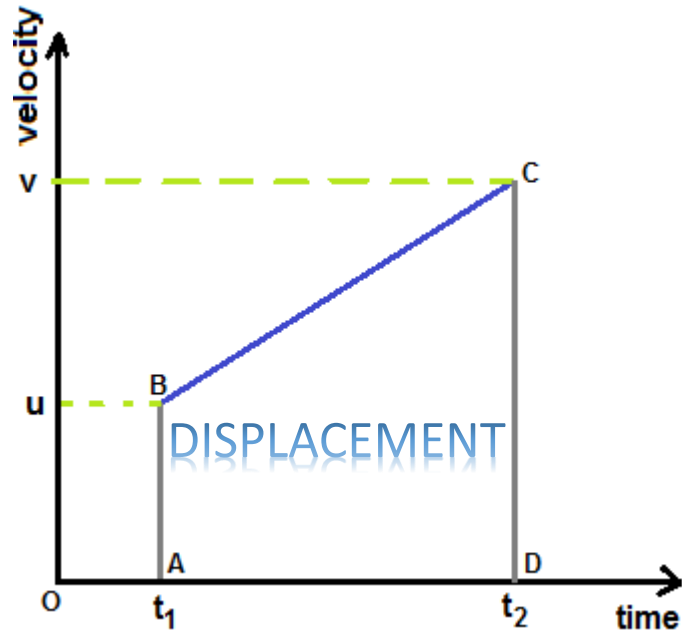
Q) Area under a v - t graph represents a physical quantity which has the unit

(a) m^2

(b) m

(c) m^3

(d) ms^{-1}

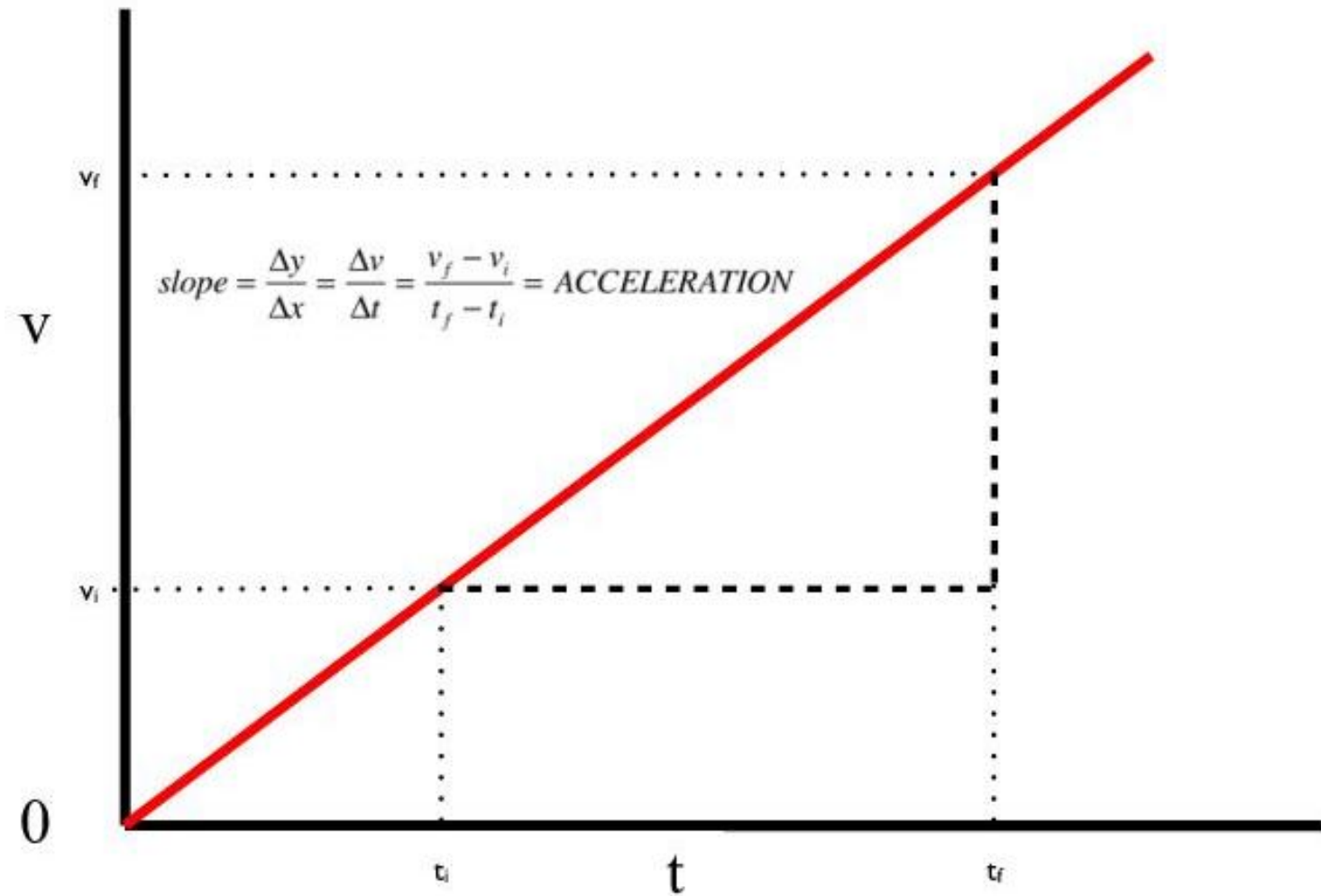


Q) Slope of a velocity-time graph gives

- (a) the distance
- (b) the displacement
- (c) the acceleration
- (d) the speed

Q) Slope of a velocity-time graph gives

- (a) the distance
- (b) the displacement
- (c) the acceleration**
- (d) the speed



- Q)** A boy goes from A to B with a speed of 20 m/min and comes back from B to A with a speed of 30 m/min. The average speed of the boy during the whole journey is
- (a) 24 m/min
 - (b) 25 m/s
 - (c) Zero
 - (d) 20 m/min

Q) A boy goes from A to B with a speed of 20 m/min and comes back from B to A with a speed of 30 m/min. The average speed of the boy during the whole journey is

(a) 24 m/min

(b) 25 m/s

(c) Zero

(d) 20 m/min

Let the distance between A and B is D meter.

A boy goes from A to B with a velocity of 20m/min.

So the time =D/20

He comes back from B to A with a velocity of 30 m/min.

So, the time= D/30.

Total time=D/20+D/30

=5D/60

Total distance traveled by the boy =2D.

Average velocity of the boy is a ratio of total distance to total time.

$$\begin{aligned} & \frac{2D}{\frac{5D}{60}} \\ &= \frac{2 \times 60}{5} \\ &= 24 \end{aligned}$$

Q) What do we call the distance between two consecutive compressions of a sound wave?

(a) Wave Number

(b) Frequency

(c) Wavelength

(d) Amplitude

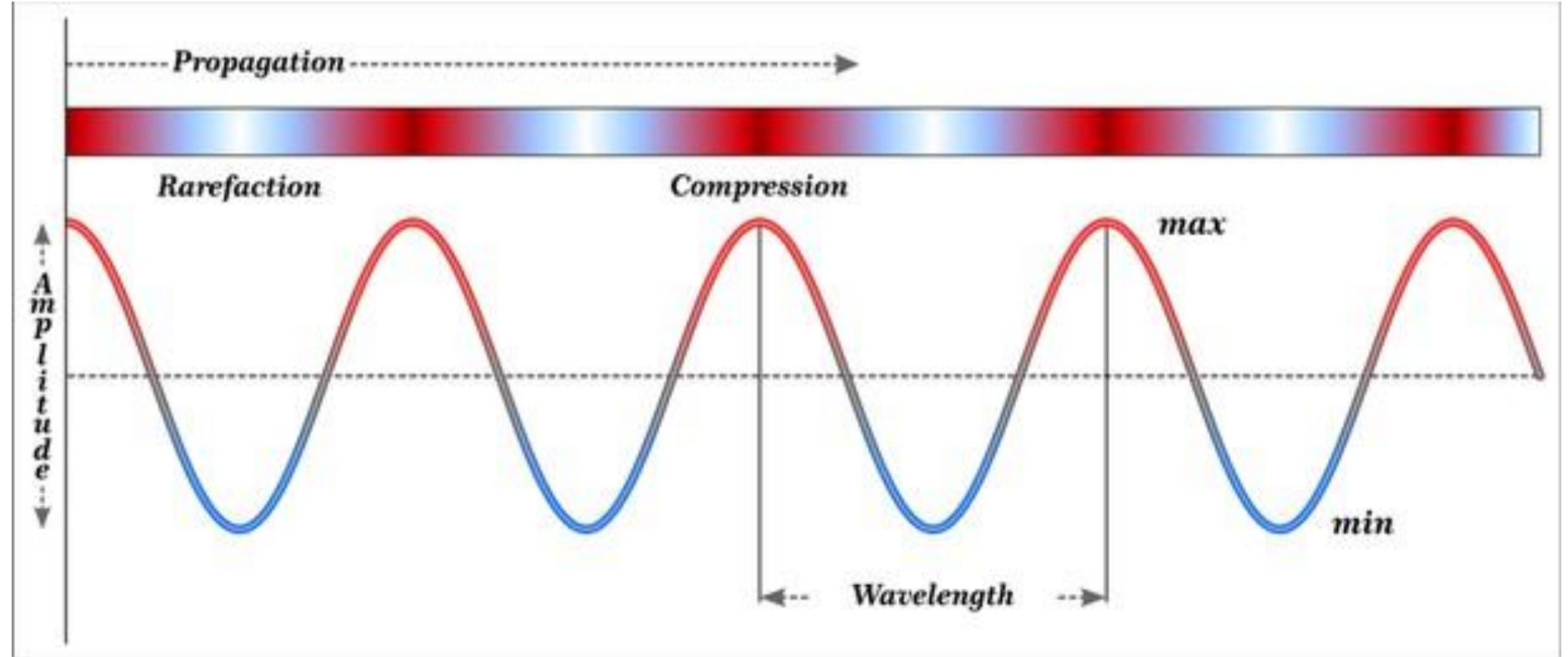
Q) What do we call the distance between two consecutive compressions of a sound wave?

(a) Wave Number

(b) Frequency

(c) Wavelength

(d) Amplitude



Q) In which of the following sound cannot travel?

(a) Solids

(b) Liquids

(c) Gases

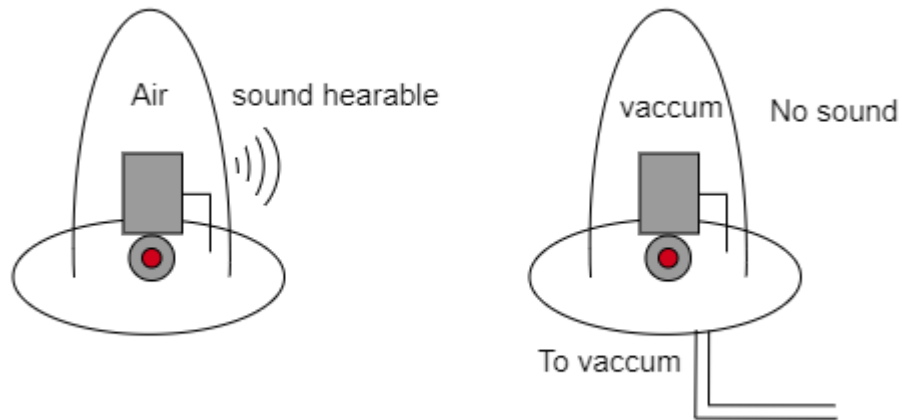
(d) Vacuum

Q) In which of the following sound cannot travel?

- (a) Solids
- (b) Liquids
- (c) Gases

(d) Vacuum

Sound cannot travel through vacuum as there is no particles present for vibrations to take place.



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- Q)** What is the time taken by two consecutive compressions or rarefaction to cross a fixed point in a sound wave known as?
- (a) amplitude
 - (b) Time Period
 - (c) Angular frequency
 - (d) Angular displacement

Q) What is the time taken by two consecutive compressions or rarefaction to cross a fixed point in a sound wave known as?

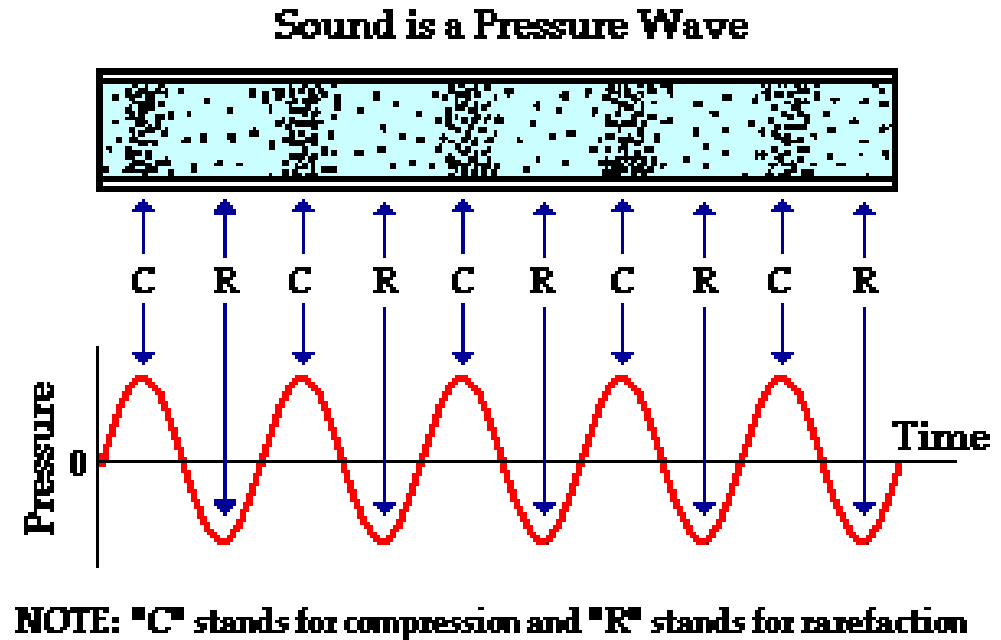
(a) amplitude

(b) Time Period

(c) Angular frequency

(d) Angular displacement

The time taken by two consecutive compressions or two rarefactions to cross a fixed point is called the time period (T) of the sound wave.



- Q)** What is the relationship between the frequency and the pitch of a sound wave?
- (a) Higher the frequency, higher the pitch
 - (b) lower the frequency higher the pitch
 - (c) pitch is not dependent on the frequency
 - (d) none of above

Q) What is the relationship between the frequency and the pitch of a sound wave?

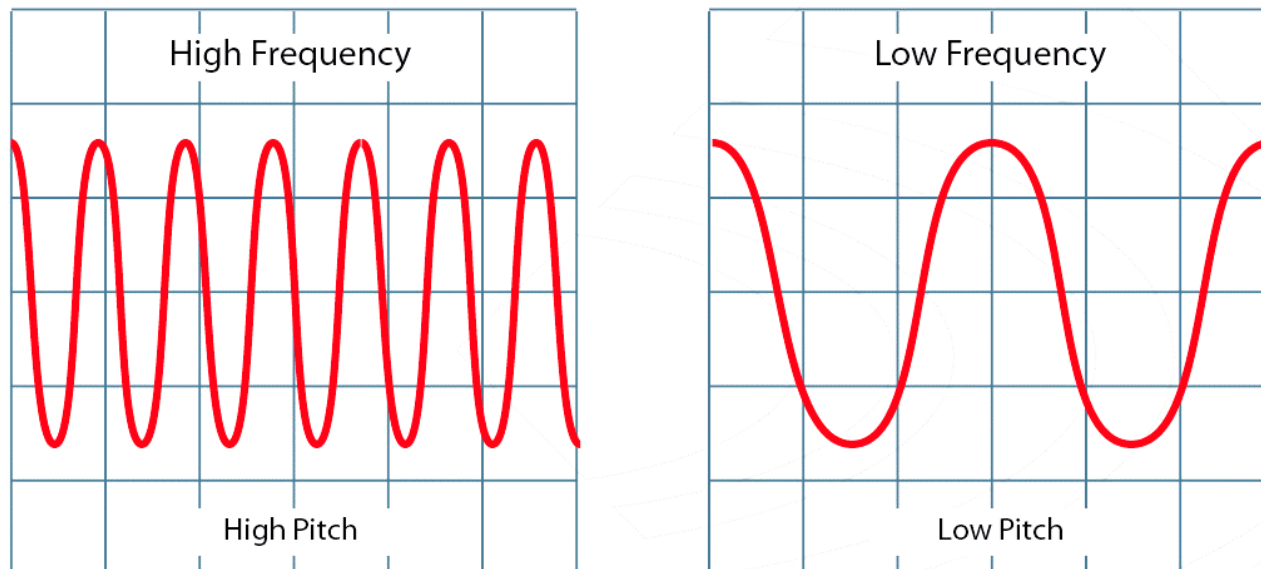
(a) Higher the frequency, higher the pitch

(b) lower the frequency higher the pitch

(c) pitch is not dependent on the frequency

(d) none of above

A high pitch sound corresponds to a high frequency sound wave and a low pitch sound corresponds to a low frequency sound wave.

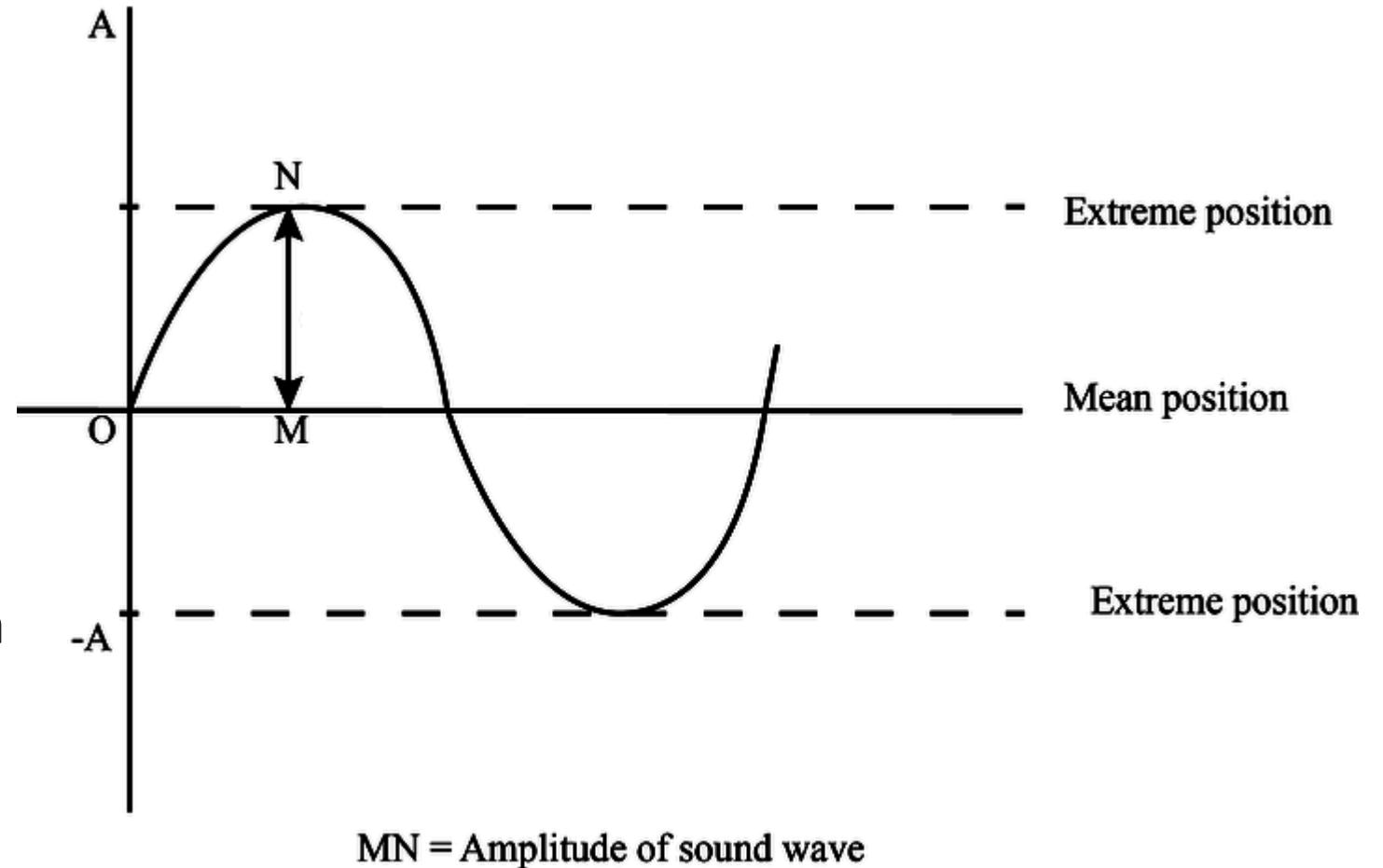


- Q)** What do we call the magnitude of maximum disturbance in the medium on either side of the mean value called as
- (a) frequency
 - (b) angular displacement
 - (c) amplitude
 - (d) wave number

Q) What do we call the magnitude of maximum disturbance in the medium on either side of the mean value called as

- (a) frequency
- (b) angular displacement
- (c) amplitude**
- (d) wave number

The magnitude of the maximum disturbance in the medium on either side of the mean value is called the amplitude of the wave..



Q) The reciprocal of frequency is

(a) Wavelength

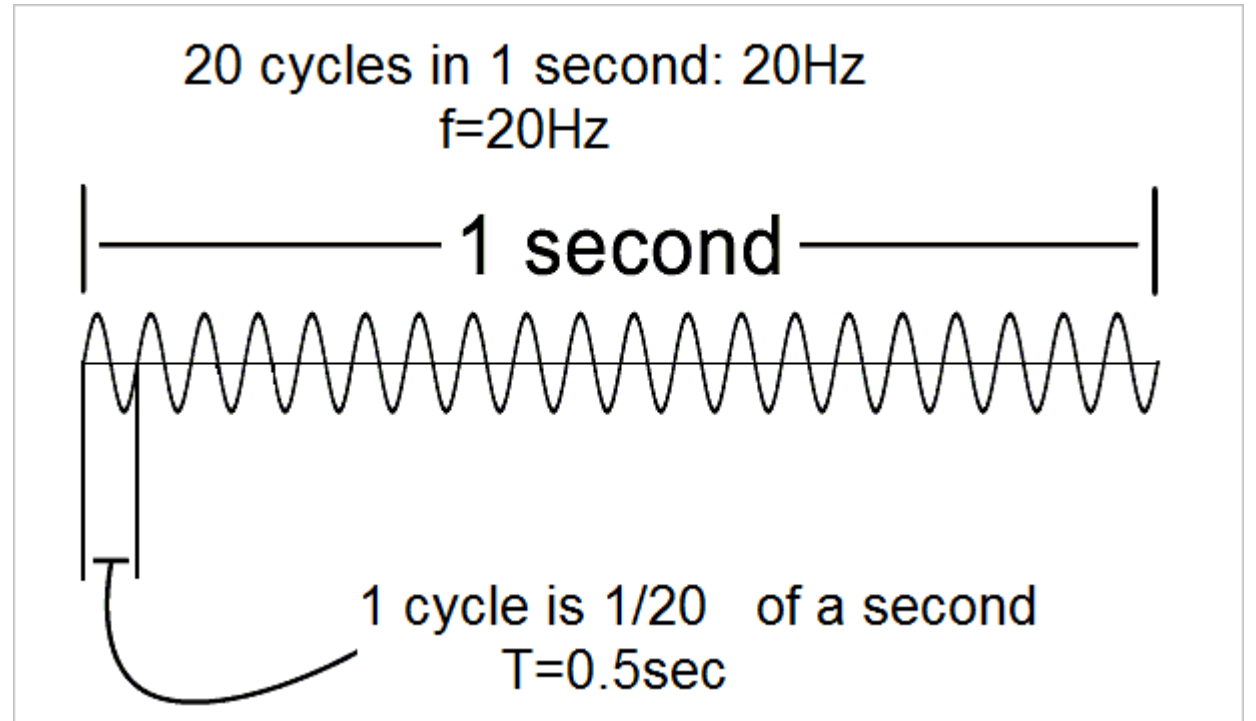
(b) amplitude

(c) time-period

(d) Wave velocity

Q) The reciprocal of frequency is

- (a) Wavelength
- (b) amplitude
- (c) time-period**
- (d) Wave velocity



The frequency of a wave is equal to the reciprocal of the period.

Both the period and the frequency of a wave depend only on its source. They do not depend on the wave's speed or the medium.

Q) A fan is marked 900 r.p.m.(revolution per minute). What is the frequency of movement of its blades

(a) 900 Hz

(b) 90 Hz

(c) 15 Hz

(d) 10 Hz

Q) A fan is marked 900 r.p.m.(revolution per minute). What is the frequency of movement of its blades

(a) 900 Hz

(b) 90 Hz

(c) 15 Hz

(d) 10 Hz

Frequency of fan is 900 rpm

Now to find it in Hz we will convert minute into seconds.

So, $900 \text{ rpm} = 900/60 \text{ revolution per second}$
 $= 15 \text{ Hz}$

Q) We can distinguish between a man's voice and a woman's voice of the same loudness even without seeing them. This is due to a characteristic of sound which measures the shrillness of sounds. Can you choose the correct unit of the quantity on which this characteristic of sound depends?

(a) hertz

(b) meter/second

(c) meter

(d) unitless

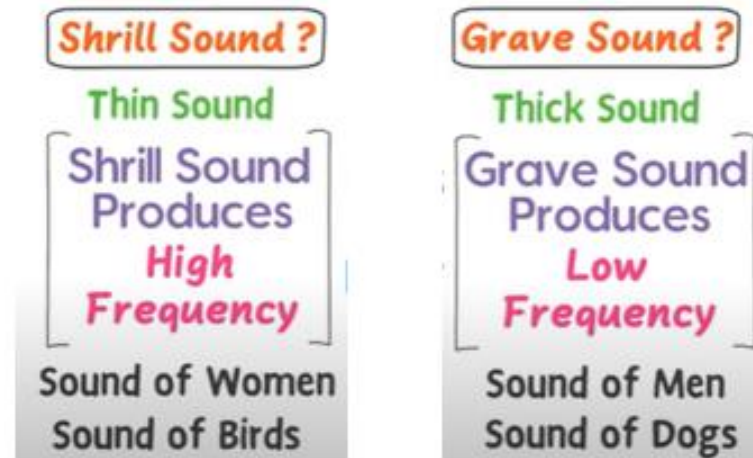
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(a) hertz

(b) meter/second

(c) meter

(d) unitless



Unit of frequency is Hertz

- Q)** The echo-receiver of a sonar attached to a ship, receives the echo from the bottom of sea 4 seconds after the ultrasonic waves were sent into the sea. If the speed of sound in water is 1500 m/s, then what is the depth of the sea?
- (a) 6000 m
 - (b) 3000 m
 - (c) 15000 m
 - (d) 3500 m

Q) The echo-receiver of a sonar attached to a ship, receives the echo from the bottom of sea 4 seconds after the ultrasonic waves were sent into the sea. If the speed of sound in water is 1500 m/s, then what is the depth of the sea?

(a) 6000 m

(b) 3000 m

(c) 15000 m

(d) 3500 m

The time taken by the ultrasonic sound waves to travel from the ship to the sea-bed, and back to the ship is 4 seconds. So, the time taken by the ultrasonic sound to travel from the ship to sea-bed will be half of this time, which is $4/2=2$ second. This means that the sound takes 2 seconds to travel from the ship to the bottom of the sea.

Now, Speed = Distance/Time

So, $1500 = \text{Distance}/2$

And Distance = $1500 \times 2 \text{m} = 3000 \text{m}$

Thus, the depth of this sea below the ship is 3000 metres.

- Q) Before the main shock waves, the earthquake produces the characteristic sound waves which some animals like rhinoceros can hear. What kind of sound waves produced here?
- (a) Infrasonic sounds
 - (b) Ultrasonic sounds
 - (c) Audible Sounds
 - (d) None of these

Q) Before the main shock waves, the earthquake produces the characteristic sound waves which some animals like rhinoceros can hear. What kind of sound waves produced here?

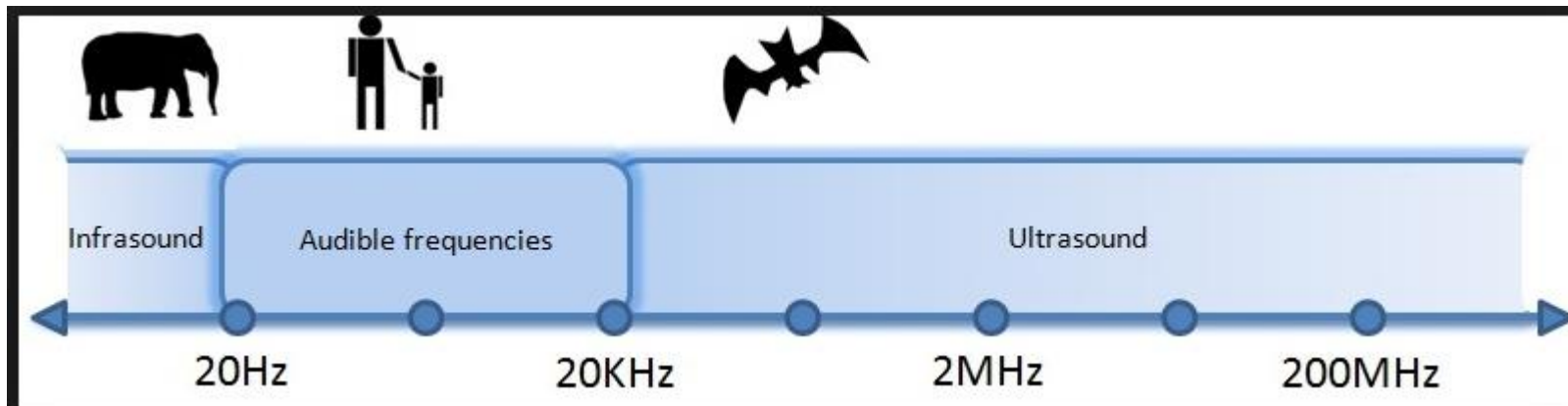
(a) **Infrasonic sounds**

(b) Ultrasonic sounds

(c) Audible Sounds

(d) None of these

Sound produced by earthquakes, thunder, volcanoes are in Infrasonic range. Human ear can't hear this sound but elephants, rhinoceros and whales can hear this.



- Q)** Which of the following is true of two objects of different masses falling freely near the surface of the moon?
- (a) They both have different accelerations.
 - (b) They have the same velocities at any instant
 - (c) They experience forces of the same magnitude
 - (d) They change their inertia

- Q)** Which of the following is true of two objects of different masses falling freely near the surface of the moon?
- (a) They both have different accelerations.
 - (b) They have the same velocities at any instant**
 - (c) They experience forces of the same magnitude
 - (d) They change their inertia

Two different masses falling freely near the moon's surface have the same velocities at any instant because in freefall acceleration or velocity is independent of mass and shape of the object.

Q) The value of acceleration due to gravity

(a) is same on equator and poles

(b) is least on poles

(c) is least on equator

(d) increases from pole to equator

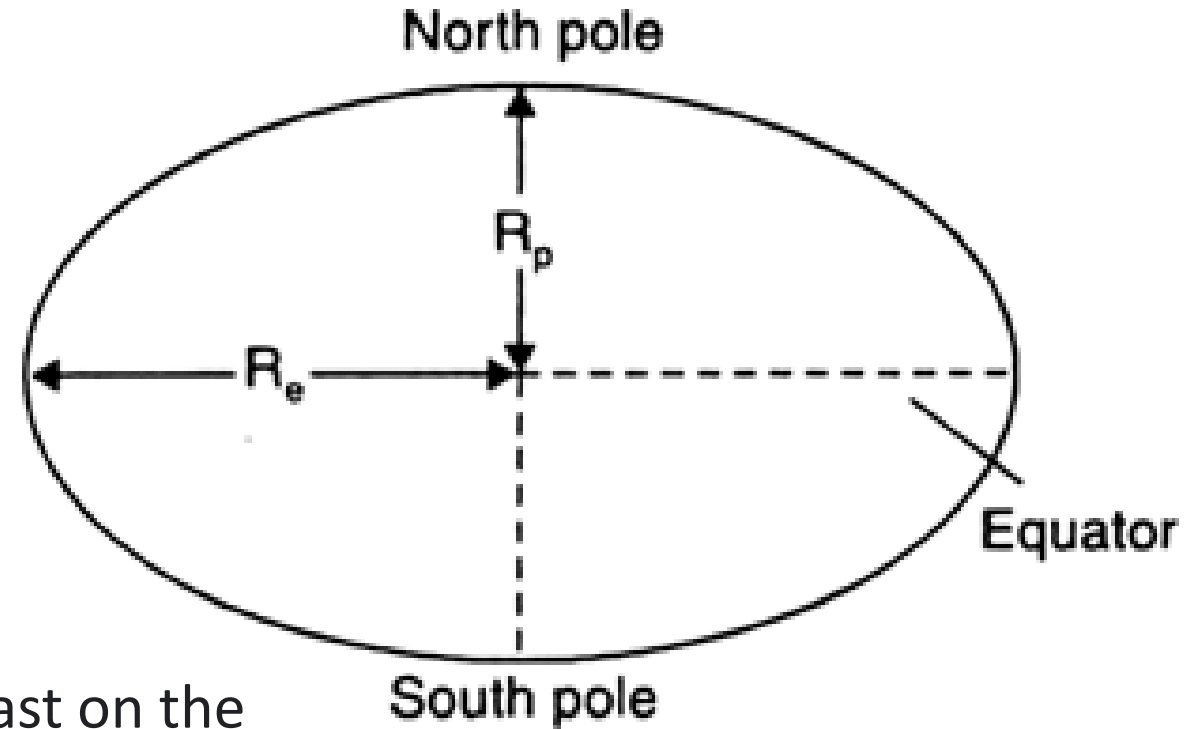
Q) The value of acceleration due to gravity

(a) is same on equator and poles

(b) is least on poles

(c) is least on equator

(d) increases from pole to equator



The value of acceleration due to gravity is least on the equator because the distance between the surface of the earth and its centre is more on the equator than in poles.

Q) The gravitational force between two objects is F . If masses of both objects are halved without changing the distance between them, then the gravitational force would

become

(a) $F/4$

(b) $F/2$

(c) F

(d) $2F$

Q) The gravitational force between two objects is F . If masses of both objects are halved without changing the distance between them, then the gravitational force would become

(a) $F/4$

(b) $F/2$

(c) F

(d) $2F$

$$F = GMm/r^2$$

$$F' = G(M/2)(m/2)/r^2$$

$$F' = GMm/4r^2$$

$$F' = F/4$$

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Q) Which will exert more pressure, 100 kg mass on 10 m² (P_1) or 50 kg mass on 4 m² (P_2)?

(a) $P_1 > P_2$

(b) $P_1 < P_2$

(c) $P_1 = P_2$

(d) None of the above

Q) Which will exert more pressure, 100 kg mass on 10 m² (P_1) or 50 kg mass on 4 m² (P_2)?

(a) $P_1 > P_2$

(b) $P_1 < P_2$

(c) $P_1 = P_2$

(d) None of the above

$$\text{Pressure exerted by 100 kg, } P_1 = \frac{\text{Force}}{\text{Area}} = \frac{mg}{A} = \frac{100 \times 10}{10} = 100 \text{ Pa}$$

$$\text{Pressure exerted by 50 kg, } P_2 = \frac{mg}{A} = \frac{50 \times 10}{4} = 125 \text{ Pa}$$

Thus, $P_1 > P_2$.

Q) An object of volume V is immersed in a liquid of density ρ . Calculate the magnitude of buoyant force acting on the object due to liquid.

(a) $V\rho g/2$

(b) $2V\rho g$

(c) $V\rho g$

(d) $V\rho g/4$

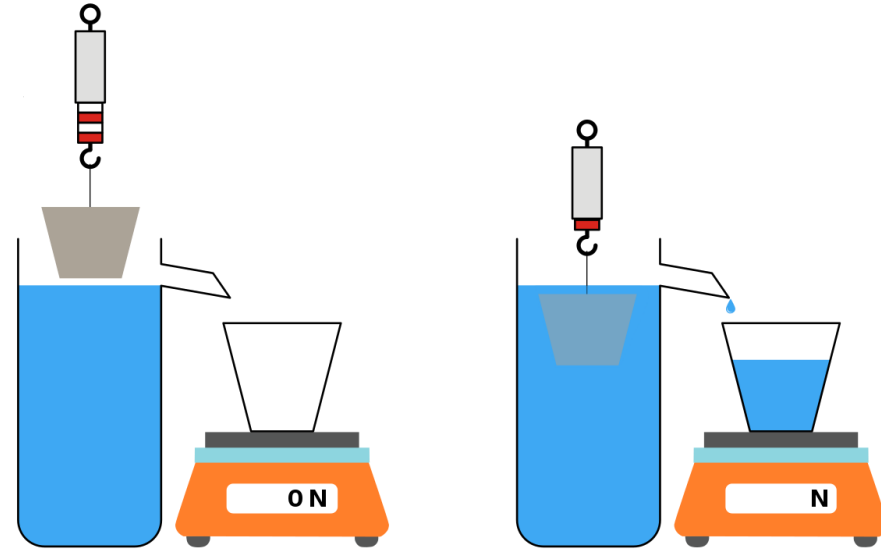
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Magnitude of buoyant force acting on the object
due to liquid = weight of liquid displaced
= mass of liquid displaced $\times g$ ($\because W = mg$)
= Volume of body \times density of liquid $\times g = V\rho g$

Q) An apple and a stone dropped from certain height accelerates?

- (a) equally .
- (b) Differently
- (c) depending on density
- (d) depends on the position of the sun

Q) An apple and stone dropped from certain height accelerates ?

(a) **equally**

(b) Differently

(c) depending on density

(d) depends on the position of the sun

The earth pull is not dependent on the mass of the body. The free fall of both the objects will be the same. Both will fall due to the gravitational pull of the earth. Hence, they accelerate equally.

- Q)** According to Archimedes principle when a body is submerged in a liquid, it's apparent weight
- (a) decreases
 - (b) increases
 - (c) remains unchanged
 - (d) may increase or decrease depending upon the material of the body

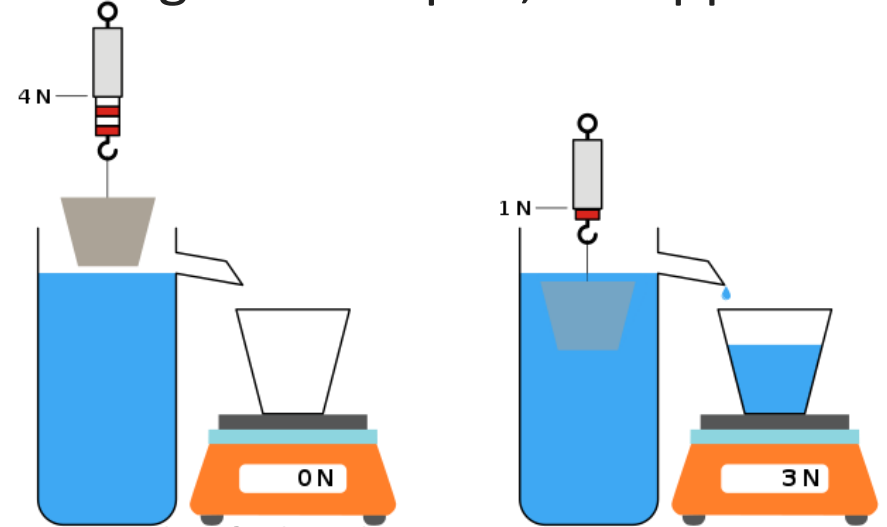
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According to Archimedes principle,
Apparent weight = Actual weight – buoyant force

- Q) Newton's law of gravitation applies to
- (a) Small bodies only
 - (b) Plants only
 - (c) All bodies irrespective of their size
 - (d) For solar system

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(a) Small bodies only

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Newton's law of universal gravitation states that a particle attracts every other particle in the universe using a force that is directly proportional to the product of their masses and inversely proportional to the square of the distance between their centres. As such, it applies to **any pair of bodies**.

- Q)** The Earth attracts the moon with a gravitational force of 10^{20}N . The moon attracts the earth with a gravitational force of
- (a) Less than 10^{20}N
 - (b) 10^{20}N
 - (c) Greater than 10^{20}N
 - (d) 10^{-20}N

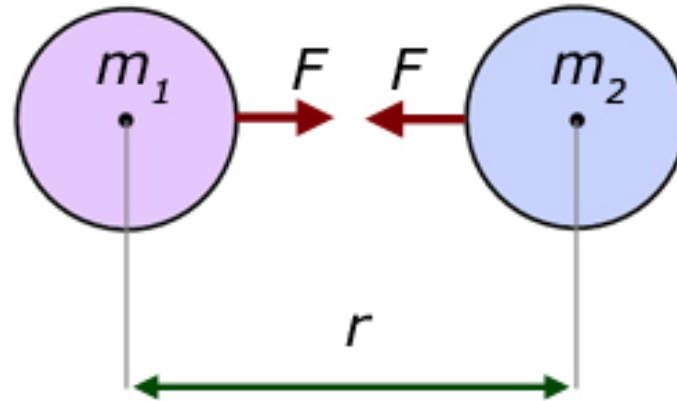
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(a) Less than 10^{20}N

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Q) The walls of a dam at the bottom are made thick because

- (a) it looks attractive
- (b) it is conventional
- (c) it is convenient
- (d) water exerts large pressure at the bottom

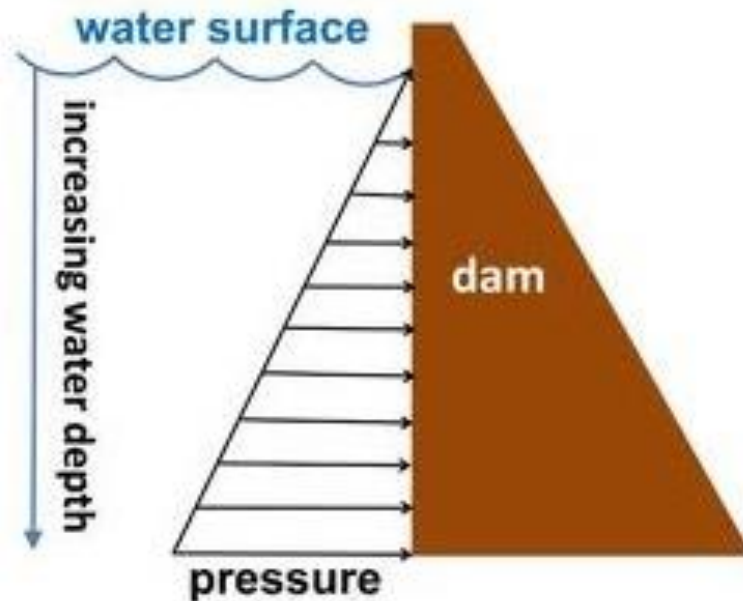
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- Q)** According to the third law of motion, action and reaction
- (a) always act on the same body
 - (b) always act on different bodies in opposite directions
 - (c) have same magnitude and directions
 - (d) act on either body at normal to each other

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- Q)** A goalkeeper in a game of football pulls his hands backwards after holding the ball shot at the goal. This enables the goalkeeper to
- (a) exert larger force on the ball
 - (b) increase the force exerted by the balls on the hands
 - (c) increase the rate of change of momentum
 - (d) decrease the rate of change of momentum

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 - (d) decrease the rate of change of momentum**

A large force that acts in a very short duration of time is referred to as impulsive force. This force which is large due to a high speed such as a kick of a football may be disastrous as the momentum change is large and hence a goalkeeper holds his hand backwards in order to reduce the force exerted on his hands.

- Q)** The inertia of an object tends to cause the object
- (a) to increase its speed
 - (b) to decrease its speed
 - (c) to resist any change in its state of motion
 - (d) to decelerate due to friction

- Q)** The inertia of an object tends to cause the object
- (a) to increase its speed
 - (b) to decrease its speed
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 - (d) to decelerate due to friction

Inertia is the physical property of a body to resist any change in its state of rest or of uniform motion.

- Q)** An object of mass 2 kg is sliding with a constant velocity of 4 ms^{-1} on a frictionless horizontal table. The force required to keep the object moving with the same velocity is
- (a) 32 N
 - (b) 0 N
 - (c) 2 N
 - (d) 8 N

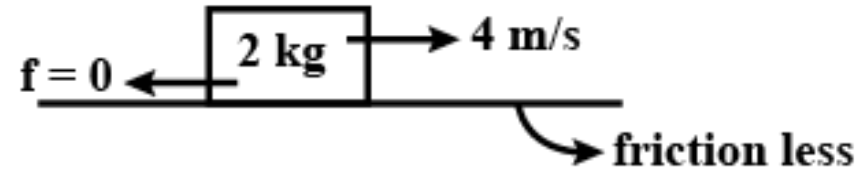
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(a) 32 N

(b) 0 N

(c) 2 N

(d) 8 N



As the surface is frictionless.

From Newton's 1st law of motion, since there is no external force acting on the object, it will remain in its original state of motion i.e., uniform velocity. Therefore, zero force is required to keep the object moving with constant velocity.

- Q)** A water tanker filled up to $\frac{2}{3}$ of its height is moving with a uniform speed. On a sudden application of brakes, the water in the tank would
- (a) move backward
 - (b) move forward
 - (c) be unaffected
 - (d) rise upwards

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(b) move forward

(c) be unaffected

(d) rise upwards



When the tanker's brakes are applied. The velocity of the tanker decreases but the velocity of the water inside remains as before. So, the water tends to push itself forward towards the wall of the tanker.

Q) Two army persons A and B each of weight of 500 N climb up a rope through a height of 10 m. A takes 20 s while B takes 40 s to achieve this task. What is ratio of the powers of person A and B?

(a) 1 : 2

(b) 1 : 4

(c) 2 : 1

(d) 14 : 1

Q) Two army persons A and B each of weight of 500 N climb up a rope through a height of 10 m. A takes 20 s while B takes 40 s to achieve this task. What is ratio of the powers of person A and B?

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(c) 2 : 1

(d) 14 : 1

$$\text{Power} = W/T$$

$$\text{And } W = Fs$$

W is same for both

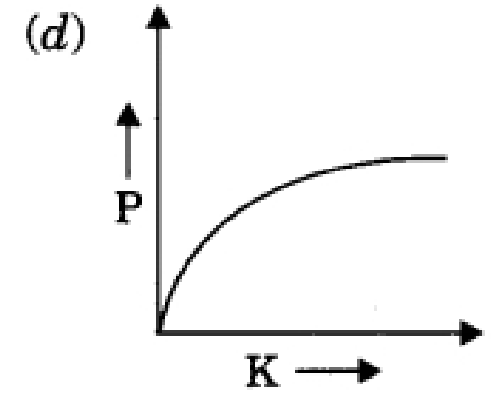
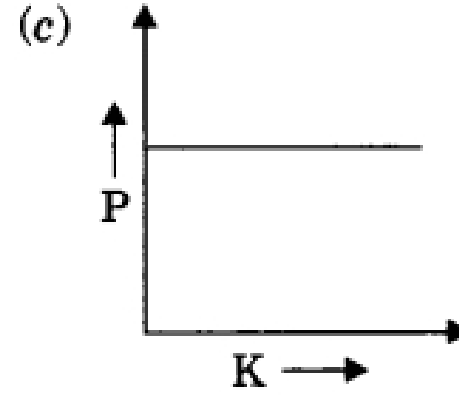
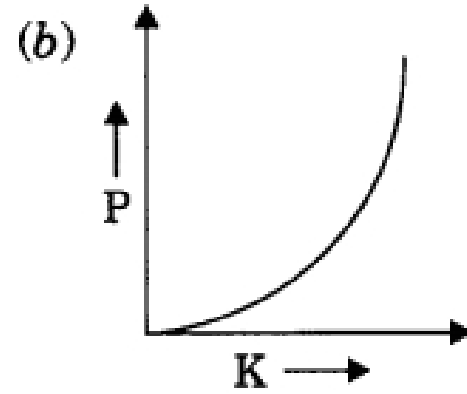
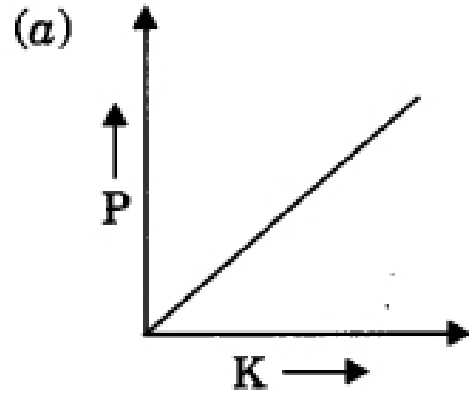
$$\text{So, } P_A = W/20$$

$$P_B = W/40$$

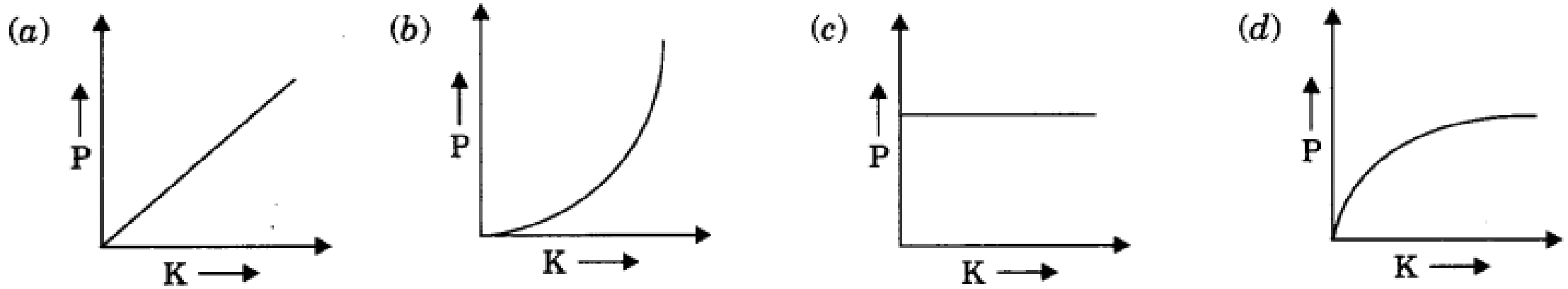
$$P_A/P_B = (W/20)/(W/40)$$

$$P_A/P_B = 40/20 = 2/1$$

Q) Which of the following graphs best represents graphical relation between momentum P and kinetic energy K for a body in motion?



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Ans) (d)

Relation between Kinetic energy and momentum

$$K = \frac{P^2}{2M}$$

So, the behaviour will be parabolic in nature about K

Q) If speed of a car becomes 2 times, its kinetic energy becomes

(a) 4 times

(b) 8 times

(c) 16 times

(d) 12 times

Q) If speed of a car becomes 2 times, its kinetic energy becomes

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(c) 16 times

(d) 12 times

$$v' = 2v$$

$$K' = \frac{1}{2}(mv'^2)$$

$$K' = \frac{1}{2}(m(2v)^2)$$

$$K' = 4 \frac{1}{2}(mv^2)$$

- Q)** Work done by friction
- (a) increases kinetic energy of body
 - (b) decreases kinetic energy of body
 - (c) increases potential energy of body
 - (d) decreases potential energy of body

Q) Work done by friction

(a) increases kinetic energy of body

(b) decreases kinetic energy of body

(c) increases potential energy of body

(d) decreases potential energy of body

- The frictional force is the force that opposes an object's motion when it begins to move.
- The kinetic energy of an object is the result of its motion.
- As a result, the object loses kinetic energy and is unable to move if it is at rest or resists further movement if it is already moving due to friction.

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- Q)** When a coil spring is compressed, the work is done on the spring. The elastic potential energy
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 - (b) decreases
 - (c) disappears
 - (d) remains unchanged

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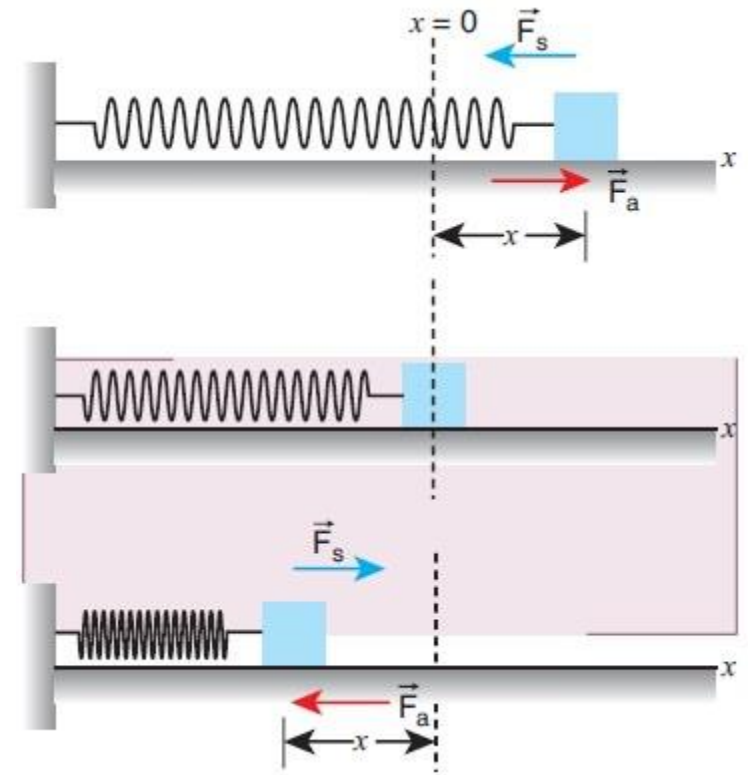
Work done by a coil spring is given by,

$$W = \frac{1}{2}(kx^2)$$

where k is the spring constant / stiffness

X is the extension or compression produced

This work done is stored in spring as elastic potential energy (PE) when the spring is compressed and hence elastic potential energy decreases.



- Q)** A current of 1.0 A is drawn by a filament of an electric bulb for 10 minutes. The amount of electric charge that flows through the circuit is
- (a) 0.1 C
 - (b) 10 C
 - (c) 600 C
 - (d) 800 C

Q) A current of 1.0 A is drawn by a filament of an electric bulb for 10 minutes. The amount of electric charge that flows through the circuit is

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$$\text{Electric current (I)} = \frac{\text{Electric charge (Q)}}{\text{Time (t)}}$$

- SI unit of current is **ampere** and it is denoted by the letter **A**.

CALCULATION:

Given - Electric current (I) = 1 A and time (t) = 10 minutes = 600 sec

- The **amount of electric charge that flows through the circuit** is

$$\Rightarrow Q = I \times t$$

$$\Rightarrow Q = 1 \times 600 = 600 \text{ C}$$

Q) Which one of the following formulas does *not* represent electrical power?

(a) I^2R

(b) IR^2

(c) VI

(d) V^2/R

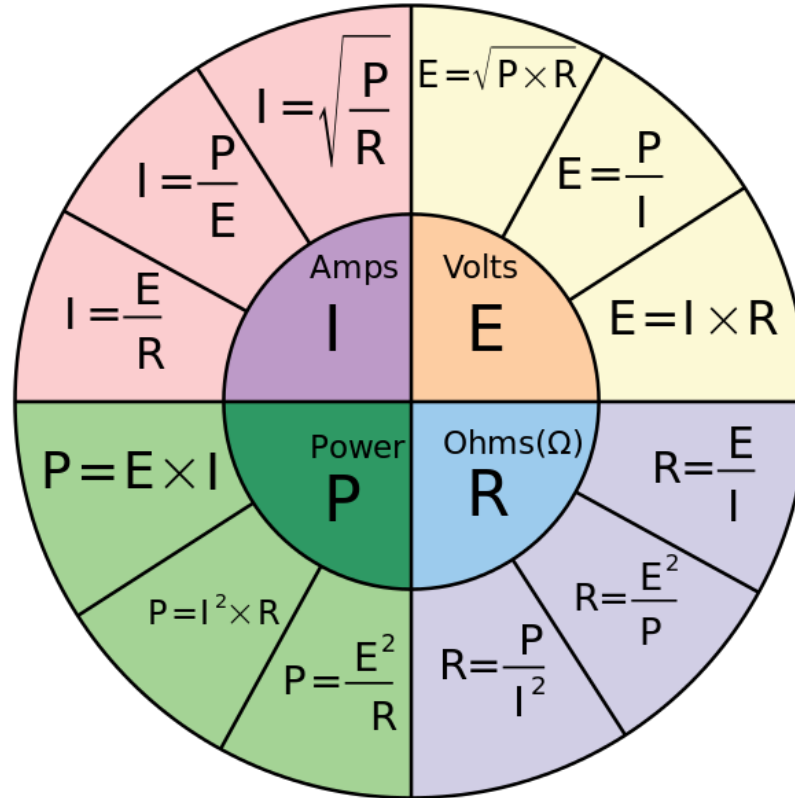
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- Q)** An electric wire of resistance 50 ohm is cut into five equal wires. These wires are then connected in parallel. What is the equivalent resistance of this combination?
- (a) 2 ohm
 - (b) 10 ohm
 - (c) 0.5 ohm
 - (d) 5 ohm

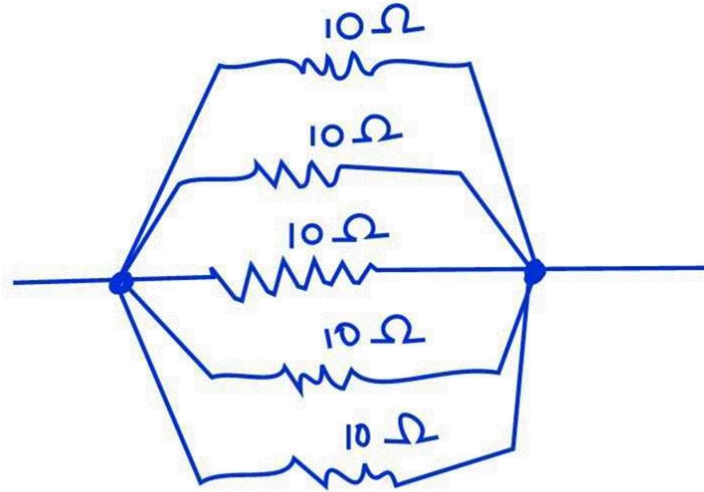
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Q) Which one of the following correctly represents the SI unit of resistivity ?

(a) Ω

(b) Ω/m

(c) $\Omega \text{ cm}$

(d) $\Omega \text{ m}$

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(a) Ω

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(c) $\Omega \text{ cm}$

(d) $\Omega \text{ m}$

$$R = \rho \frac{L}{A} \Rightarrow \rho = \frac{RA}{L}$$

In SI System of Unit

$$\rho = \frac{R \Omega \times A \text{ m}^2}{L \text{ m}}$$

$$\Rightarrow \rho = \frac{RA}{L} \frac{\Omega - \text{m}^2}{\text{m}} \text{ or } \Omega - \text{m}$$

- Q)** What is the current required to light a 60 W incandescent bulb in a domestic supply of 240 V ?
- (a) 0.5 A
 - (b) 0.25 A
 - (c) 1.0 A
 - (d) 5.0 A

Q) What is the current required to light a 60 W incandescent bulb in a domestic supply of 240 V ?

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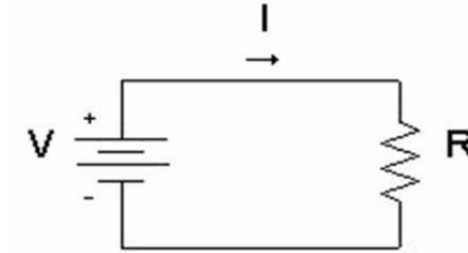
$$P = V^2/R$$

$$R = V^2/P$$

$$R = 960 \text{ ohm}$$

$$I = V/R$$

$$I = 240/960 = 0.25 \text{ A}$$



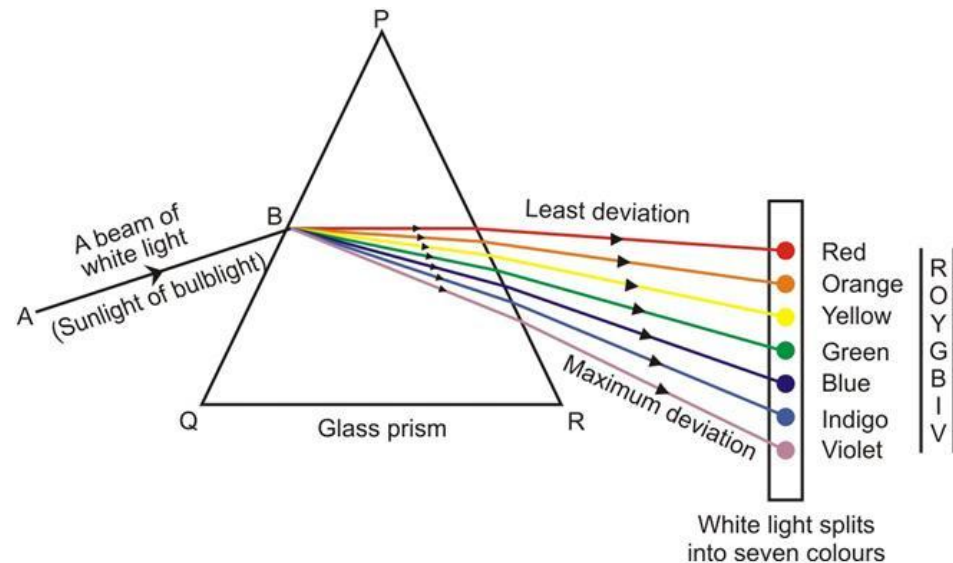
Basic Electrical Circuit

$$I = \frac{V}{R}$$

Ohm's Law

- Q)** A glass prism splits white light into different colours. This phenomenon is called dispersion of light by prism. Which one of the following statements is correct?
- (a) Red light will deviate the most and it is because of the reflection of light
 - (b) Violet light will deviate the most and it is because of the refraction of light
 - (c) Red light will deviate the most and it is because of the refraction of light
 - (d) Violet light will deviate the most and it is because of the reflection of light

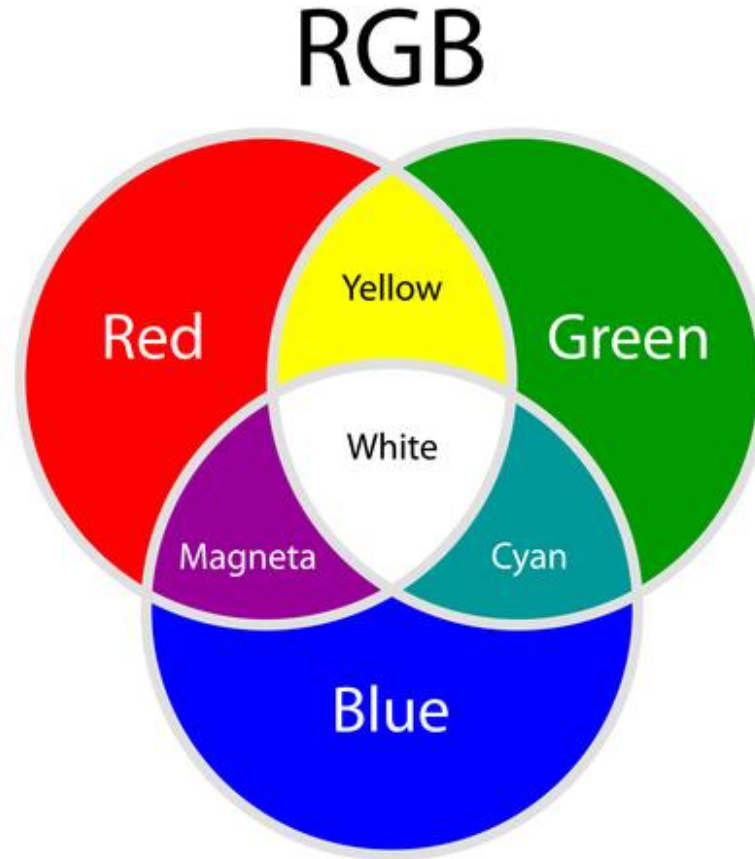
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- Q)** Which one of the following colours may be obtained by combining green and red colours?
- (a) Blue
 - (b) Magenta
 - (c) Pink
 - (d) yellow

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- Q)** Twinkling of stars is due to
- (a) particular frequencies of the Starlight
 - (b) reflection of Starlight from the oceanic surface
 - (c) atmospheric refraction of Starlight
 - (d) magnetic field of earth

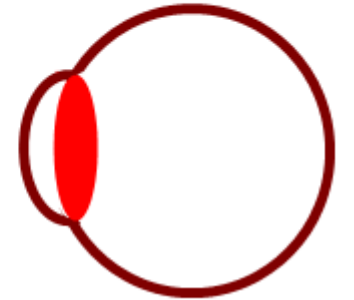
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- Q)** Myopia is a defect in human vision where an image of a
- (a) nearby object is focused beyond the retina.
 - (b) nearby object is focused before the retina.
 - (c) distant object is focused before the retina.
 - (d) distant object is focused beyond the retina.

- Q) Myopia is a defect in human vision where an image of a
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 - (d) distant object is focused beyond the retina.

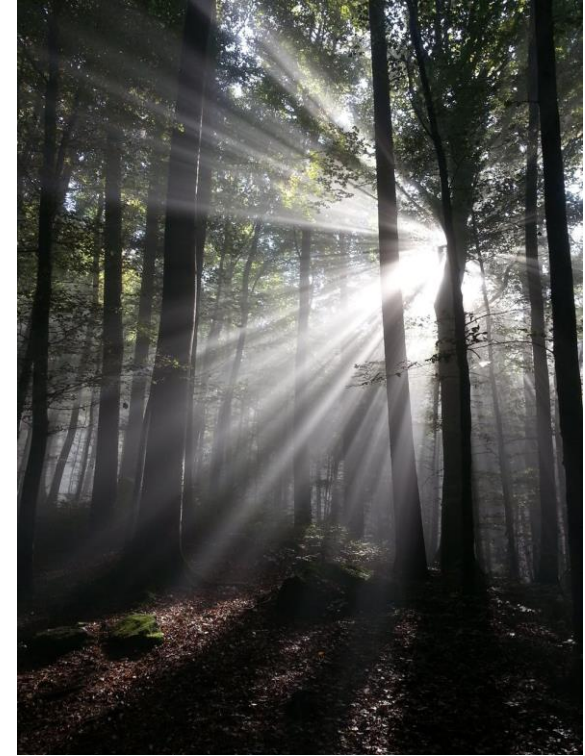
Myopia - defect and correction



Near sightedness (myopia) is a common vision condition in which you can see objects near to you clearly, but objects farther away are blurry.

- Q)** Tyndall effect is a phenomenon of
- (a) scattering of light by the colloidal particles
 - (b) refraction of light by the colloidal particles
 - (c) dispersion of light by dust particles
 - (d) refraction of light by dust particles

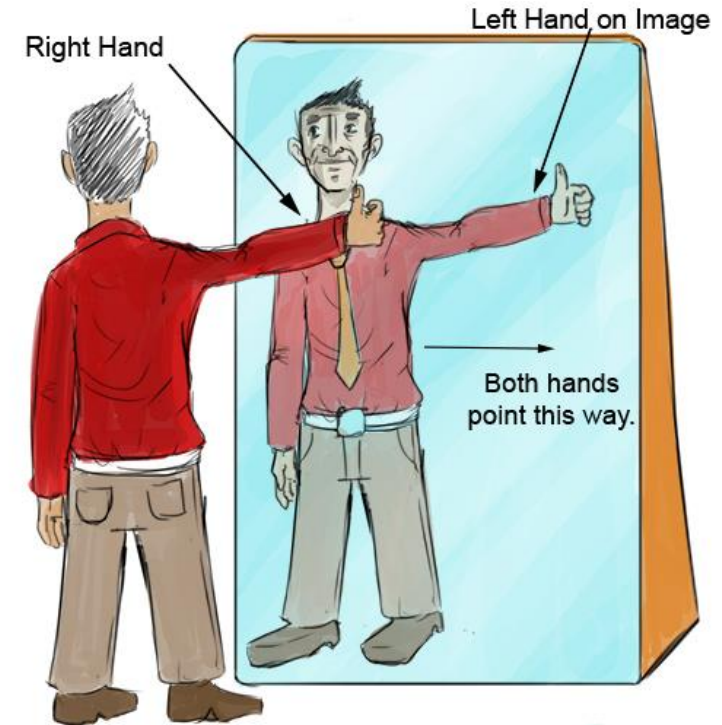
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Tyndall effect, also called Tyndall phenomenon, scattering of a beam of light by a medium containing small suspended particles. For e.g., smoke or dust in a room, which makes visible a light beam entering a window

- Q)** The image we see in plane mirror is
- (a) real and thus can be photographed
 - (b) virtual and nearer than the object
 - (c) virtual and is laterally inverted
 - (d) real but cannot be photographed

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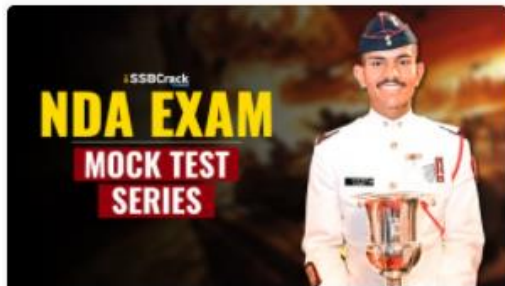
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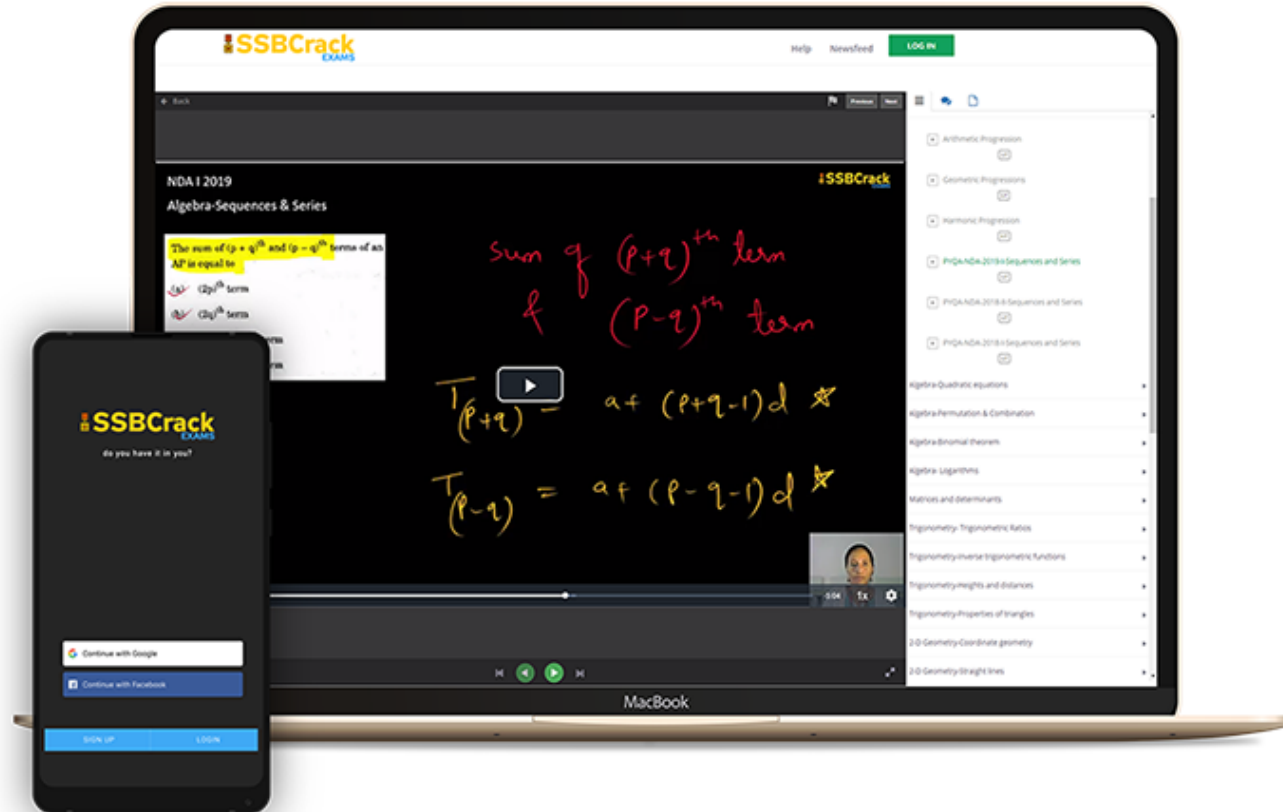


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Q) The term 'Carbon Credit' is associated with

- A. Coal reserve of a nation
- B. Reduction of Green House Gas emissions
- C. Fossil Fuel reserve
- D. Amount of CO₂ an individual emits in a year

Q) The term 'Carbon Credit' is associated with

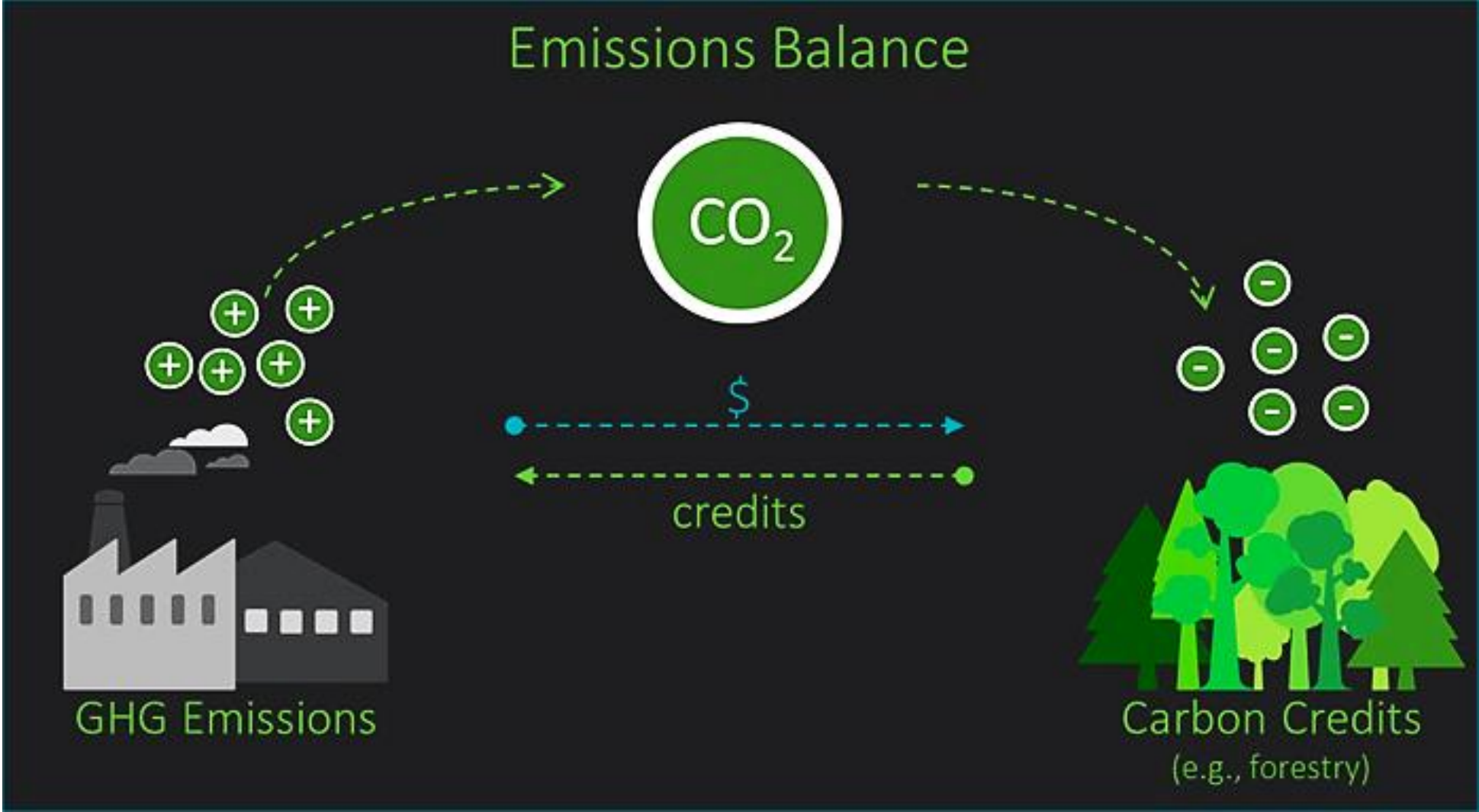
A. Coal reserve of a nation

B. Reduction of Green House Gas emissions

C. Fossil Fuel reserve

D. Amount of CO₂ an individual emits in a year

The term Carbon Credit is associated with Reduction of Green House Gas emissions in the atmosphere.



Q) Which one of the following statement regarding the sun is correct ?

- A. The sun is composed mainly of hydrogen.
- B. Its energy is generated by nuclear collision in its interior.
- C. It is calculated that the sun consumes about a trillion pounds of hydrogen every second.
- D. All of the above.

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Q) Haematite ores is the ore of which metal ?

A. Iron

B. Aluminum

C. Zinc

D. Cobalt

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D. Cobalt



Hematite, also spelled as haematite, is the mineral form of iron oxide, one of several iron oxides. Hematite crystallizes in the rhombohedral lattice system, and it has the same crystal structure as ilmenite and corundum.

Q) The elements which have low value of ionization potential are strong

- A. Oxidizing agents
- B. Reducing agents
- C. Oxidizing and reducing agents depending upon the reactants
- D. None of these

Q) The elements which have low value of ionization potential are strong

A. Oxidizing agents

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D. None of these

Elements with a low ionization energy tend to be reducing agents and form cations.

Q) Limonitic ore is the ore of which metal ?

A. Iron

B. Aluminium

C. Zinc

D. Cobalt

Q) Limonitic ore is the ore of which metal ?

A. Iron

B. Aluminium

C. Zinc

D. Cobalt



Limonite is an iron ore consisting of a mixture of hydrated iron(III) oxide-hydroxides in varying composition.

Q) Which of the following is not a unit of energy ?

A. Calorie

B. Joule

C. Electron volt

D. Watt

Q) Which of the following is not a unit of energy ?

- A. Calorie
- B. Joule
- C. Electron volt
- D. Watt**

The watt is a derived unit of power in the International System of Units, named after the Scottish engineer James Watt. The unit defined as one joule per second, measures the rate of energy conversion or transfer.

Q) Which of the following is not a inert gas ?

A. Argon

B. Helium

C. Hydrogen

D. Xenon

Q) Which of the following is not a inert gas ?

A. Argon

B. Helium

C. Hydrogen

D. Xenon

Hydrogen is lightest reactive gas

Q) Artificial rain is produced by seeding clouds with ?

- A. Silver iodide
- B. Potassium nitrate
- C. Copper sulphate
- D. Silver nitrate

Q) Artificial rain is produced by seeding clouds with ?

A. Silver iodide

B. Potassium nitrate

C. Copper sulphate

D. Silver nitrate

Cloud seeding is the form of weather modification, aimed at increasing precipitation. The most Common chemicals used for cloud seeding include silver iodide, potassium iodide and dry ice (solid carbon dioxide)

How cloud seeding works



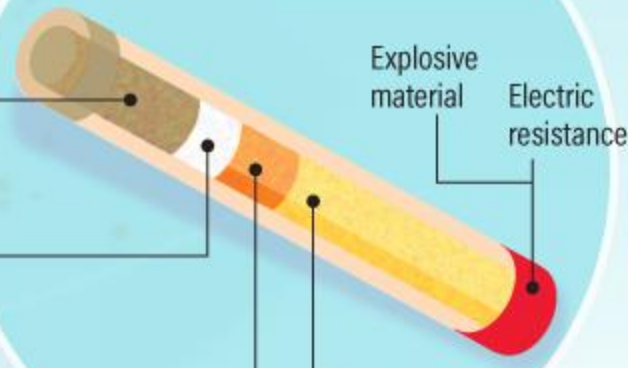
The UAE National Centre of Meteorology and Seismology aircrafts fire flares at the base of clouds in an attempt to increase rainfall



Natural salt particles

*2 to 3 minutes to fire the flare and 20 minutes to take effect

Flares* composition



5% Magnesium
Controls the flame

12% Solidarity materials
Keeps materials together

13% Sodium chloride
To attract water droplets

70% Potassium chloride
to attract water droplets

Source: National Centre of Meteorology and Seismology

Q) Heavy water is called heavy because

- A. It is denser than ordinary water
- B. It is an oxide of deuterium
- C. It has a heavy (or bad) taste
- D. It has a heavier isotope of hydrogen

Q) Heavy water is called heavy because

- A. It is denser than ordinary water
- B. It is an oxide of deuterium
- C. It has a heavy (or bad) taste
- D. It has a heavier isotope of hydrogen**

Heavy water or deuterium oxide is called heavy water because it is composed of heavier isotope of hydrogen called deuterium.

Q) Chemically sugarcane is

- A. Sucrose
- B. Fructose
- C. Lactose
- D. Glucose

Q) Chemically sugarcane is

A. Sucrose

B. Fructose

C. Lactose

D. Glucose



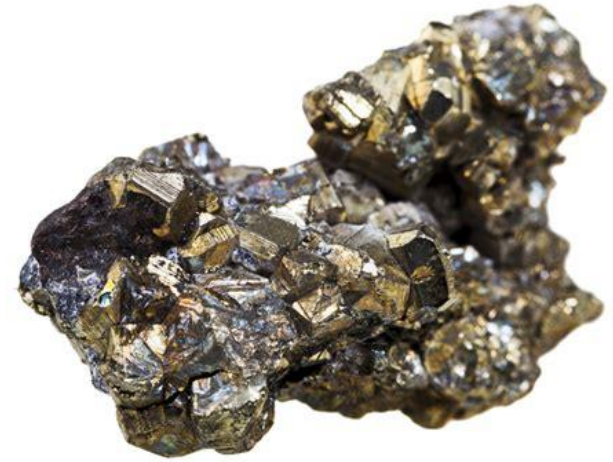
Sugarcane ranges from 7 to 18 percent sugar by weight

Q) Other name of “FOOL’S GOLD” is?

- A. Iron Pyrite
- B. Iron Sulphate
- C. Iron Carbonate
- D. None of the above

Q) Other name of “FOOL’S GOLD” is?

- A. Iron Pyrite
- B. Iron Sulphate
- C. Iron Carbonate
- D. None of the above



“Fool's Gold” is technically known as pyrite or iron sulfide (FeS_2) and is one of the most common sulfide minerals.

Pyrite is called “Fool's Gold” because it resembles gold to the untrained eye.

Q) Non-stick coating in utensils is of?

- A. Melamine
- B. Teflon
- C. Bakelite
- D. Nylon

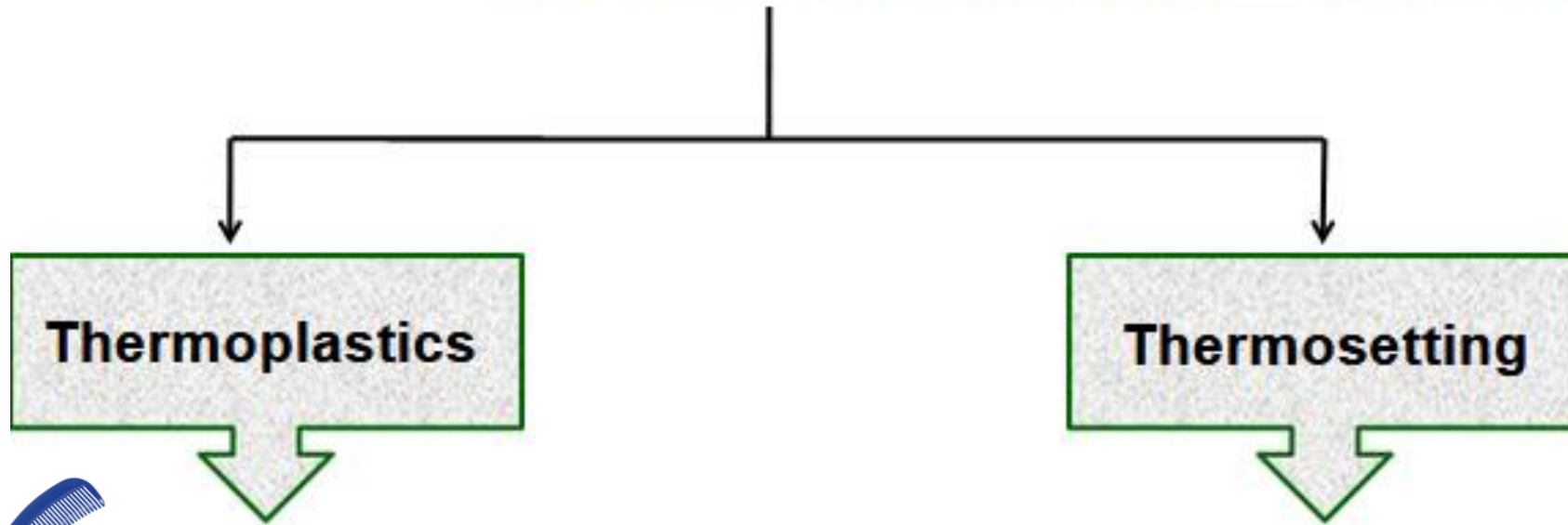
Q) Non-stick coating in utensils is of?

- A. Melamine
- B. Teflon**
- C. Bakelite
- D. Nylon



Teflon is a brand name for a synthetic chemical called polytetrafluoroethylene (PTFE). Teflon is used to coat a variety of products because it's waterproof, cuts down on friction, and creates a nonstick surface.

Types of Plastics



Polythene

PVC



- # These plastics can be melted and reshaped when heated.
- # Harden again when cooled
- # Used for making toys, containers, combs, etc.

Thermosetting

Bakelite

Melamine

- # Can be moulded only once
- # Do not soften on reheating

Thermoplastics



Q) _____ is known as Artificial Silk.

A. Rayon

B. Acrylic

C. Polyester

D. Nylon

Q) _____ is known as Artificial Silk.

- A. Rayon
- B. Acrylic
- C. Polyester
- D. Nylon



Rayon is a synthetic fiber, made from natural sources of regenerated cellulose, such as wood and related agricultural products.

Q) Which of the following is an endothermic reaction?

- A. Decomposition of calcium carbonate to calcium oxide and carbon dioxide
- B. Respiration
- C. Burning of Natural gas
- D. All of the above

Q) Which of the following is an endothermic reaction?

- A. Decomposition of calcium carbonate to calcium oxide and carbon dioxide**
- B. Respiration
- C. Burning of Natural gas
- D. Adding Zinc to dil. Sulphuric Acid

Reaction

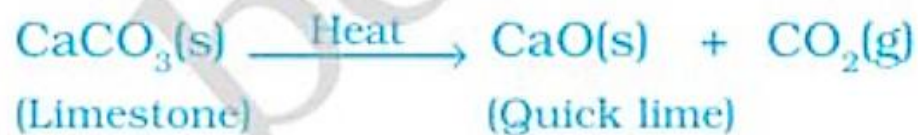
Endothermic

T ↓

Cool



Bonds Broken
Energy Required/Absorbed
Mostly Decomposition rxn



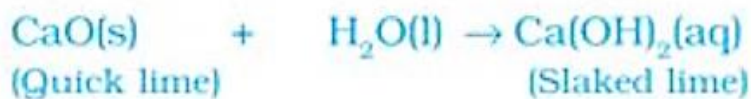
Exothermic

T ↑

Hot



Bonds formed
Energy Released
Mostly combination rxn.



Q) Which gas is liberated when a metal is added to an acid

A. Chlorine

B. Argon

C. Hydrogen

D. Carbon Dioxide

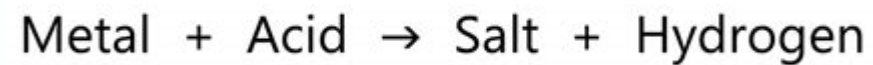
Q) Which gas is liberated when a metal is added to an acid

A. Chlorine

B. Argon

C. Hydrogen

D. Carbon Dioxide



Acids react with most metals producing salt and **hydrogen**

Q) Which of the following is NOT fat soluble vitamin

- A. Vitamin A
- B. Vitamin B
- C. Vitamin D
- D. Vitamin E

Q) Which of the following is NOT fat soluble vitamin

- A. Vitamin A
- B. Vitamin B**
- C. Vitamin D
- D. Vitamin E



VITAMINS

WATER SOLUBLE



Expelled from the body quicker and smaller amounts are stored in the body at one time

VITAMIN C	FOLATE
RIBOFLAVIN	B12
NIACIN	B6
THIAMINE	BIOTIN
PANTOTHENIC ACID	

FAT-SOLUBLE



Stored in oil and fats. They tend to stick around in the body longer.

VITAMIN A	VITAMIN E
VITAMIN D	VITAMIN K

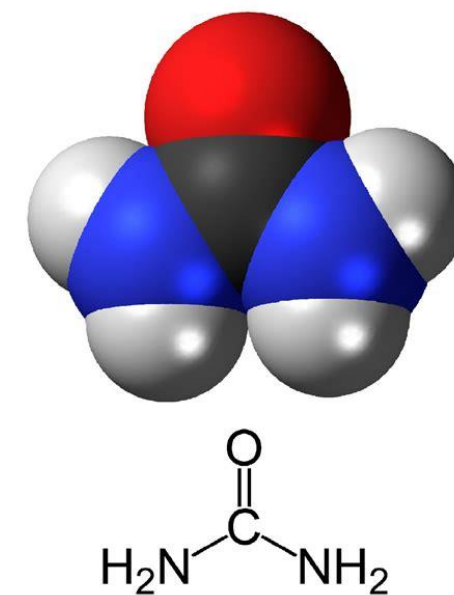
There are four fat-soluble vitamins in the human diet: A, D, E and K

Q) First organic compound synthesized in laboratory

- A. Methane
- B. Ether
- C. Urea
- D. Ethanol

Q) First organic compound synthesized in laboratory

- A. Methane
- B. Ether
- C. Urea**
- D. Ethanol



German chemist Friedrich Wöhler from ammonium cyanate in 1828 was the first generally accepted laboratory synthesis of a naturally occurring organic compound from inorganic materials.

Q) What is the change in the rate constant for a chemical reaction when temperature rises by 10°C ?

- A. The rate constant is constant
- B. The rate constant is nearly doubled
- C. The rate constant is nearly halved
- D. The rate constant becomes four times

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- B. The rate constant is nearly doubled**
- C. The rate constant is nearly halved
- D. The rate constant becomes four times

For a chemical reaction with rise in temperature by 10° , the rate constant is nearly doubled. Most of the chemical reactions are accelerated by increase in temperature.

Q) Which of these alkanes has higher boiling point?

- A. Butane
- B. Methane
- C. Ethane
- D. Hexane

Q) Which of these alkanes has higher boiling point?

- A. Butane
- B. Methane
- C. Ethane
- D. Hexane**

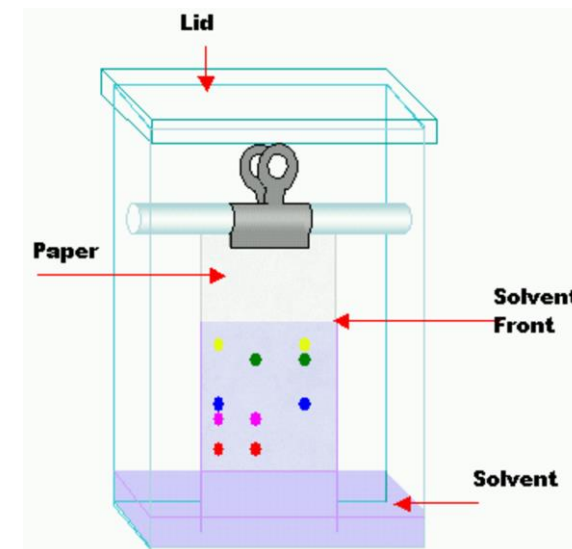
There is a steady increase in boiling point with the increase in molecular mass. This is due to the fact that the intermolecular van der Waals forces increase with increase of the molecular size or the surface area of the molecule.

Q) The best method to separate the components of an ink is

- A. Filtration
- B. Chromatography
- C. Crystallization
- D. Distillation

Q) The best method to separate the components of an ink is

- A. Filtration
- B. Chromatography**
- C. Crystallization
- D. Distillation







Ink is a mixture of coloured substances or dyes with different solubilities. Using paper chromatography, we can separate two or more different components present in the ink.

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Q) An incorrect statement about wrought iron is that

- A. It is malleable, ductile and soft.
- B. It is 100% pure iron.
- C. It is resistant towards rusting and corrosion.
- D. It can be magnetised.

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- A. It is malleable, ductile and soft.
- B. It is 100% pure iron.**
- C. It is resistant towards rusting and corrosion.
- D. It can be magnetised.



Wrought Iron has **0.2 to 0.5%** of carbon in it.

Q) Sodium benzoate is used as

- A. Food preservative
- B. Artificial sweetener
- C. Antioxidant
- D. Detergent

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- A. Food preservative
- B. Artificial sweetener
- C. Antioxidant
- D. Detergent



Sodium benzoate is commonly used as a preservative in cosmetics and personal care items, such as hair products, baby wipes, toothpaste, and mouthwash

Q) Which two elements were discovered by Marie Curie?

- A. Polonium and Radium
- B. Radium and Strontium
- C. Strontium and Radon
- D. Radon and Polonium

Q) Which two elements were discovered by Marie Curie?

- A. Polonium and Radium
- B. Radium and Strontium
- C. Strontium and Radon
- D. Radon and Polonium



Marie Curie coined the term radioactivity. She was the **1st woman to win the Nobel Prize** and **won** the award **twice**, once for physics in 1903 and again for chemistry in 1911. The unit for measuring radioactivity, the Curie, is named after her.

Q) Why a milkman adds a very small amount of baking soda to fresh milk?

- A. To decrease its pH slightly
- B. To increase its pH slightly
- C. To kill the bacteria in Fresh Milk
- D. To turn its color from slight pale to white

Q) Why a milkman adds a very small amount of baking soda to fresh milk?

- A. To decrease its pH slightly
- B. To increase its pH slightly**
- C. To kill the bacteria in Fresh Milk
- D. To turn its color from slight pale to white



The pH of fresh milk is 6, to set it as curd needs the pH below 6. In order to avoid this, the milkman shifts the pH of fresh milk from 6 to slightly alkaline by adding baking soda

Q) Galvanised iron is coated with?

- A. Magnesium
- B. Strontium
- C. Barium
- D. Zinc

Q) Galvanised iron is coated with?

- A. Magnesium
- B. Strontium
- C. Barium
- D. Zinc**



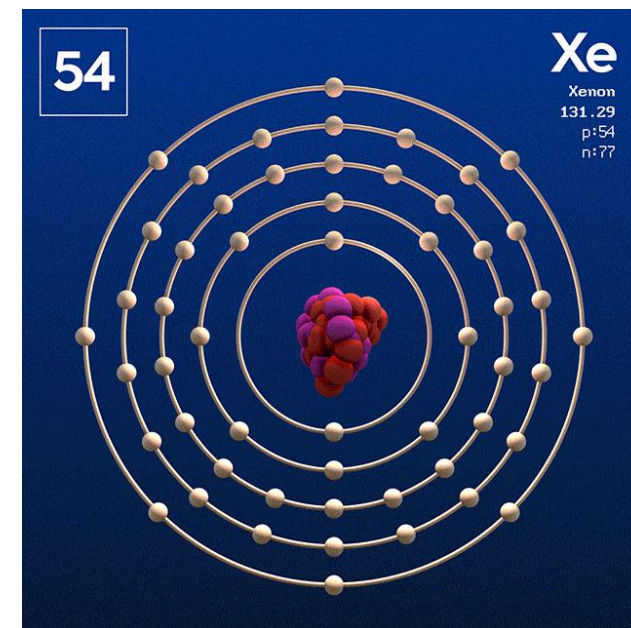
Galvanizing is the process of immersing iron or steel in a bath of molten zinc to produce a corrosion resistant, multi-layered coating of zinc-iron alloy and zinc metal.

Q) _____ is also known as 'Stranger Gas'?

- A. Xenon
- B. Chlorine
- C. Bromine
- D. Oxygen

Q) _____ is also known as 'Stranger Gas'?

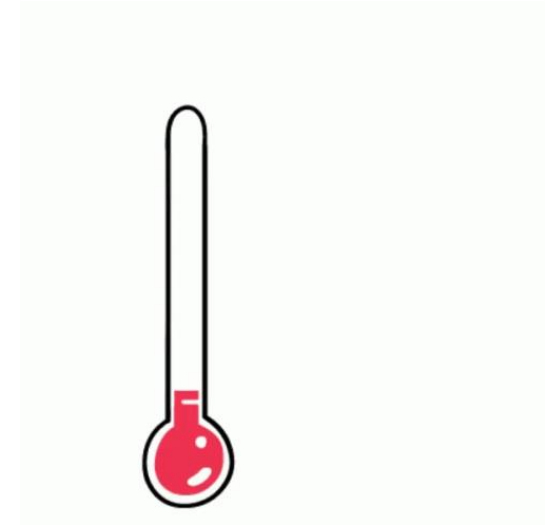
- A. Xenon
- B. Chlorine
- C. Bromine
- D. Oxygen



Xenon is called a stranger gas mainly because the element's name derived from the Greek word "**Xenos**" which translates to 'stranger'. Additionally, Xenon usually belongs to the noble gas group where elements are very unreactive. However, Xenon can react with some elements to form new compounds.

Q) The temperature of a place on one sunny day is 113 on the Fahrenheit scale. The Kelvin scale reading of this temperature will be

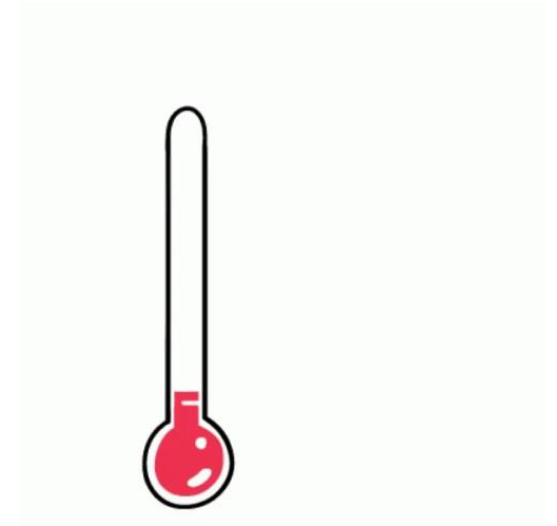
- A. 318 K
- B. 45 K
- C. 62.8 K
- D. 335.8 K



Q) The temperature of a place on one sunny day is 113 on the Fahrenheit scale. The Kelvin scale reading of this temperature will be

- A. 318 K
- B. 45 K
- C. 62.8 K
- D. 335.8 K

$$\frac{C}{5} = \frac{F - 32}{9}$$
$$\frac{C}{5} = \frac{113 - 32}{9}$$
$$C = 45^{\circ}C$$



Now, To change in kelvin,
= 45 + 273.15 K
= 318.15 K

Q) Which one of the following represents the correct order of electron releasing tendency of metals?

- A. $\text{Zn} > \text{Cu} > \text{Ag}$
- B. $\text{Ag} > \text{Cu} > \text{Zn}$
- C. $\text{Cu} > \text{Zn} > \text{Ag}$
- D. $\text{Cu} > \text{Ag} > \text{Zn}$

Q) Which one of the following represents the correct order of electron releasing tendency of metals?

A. Zn > Cu > Ag

B. Ag > Cu > Zn

C. Cu > Zn > Ag

D. Cu > Ag > Zn

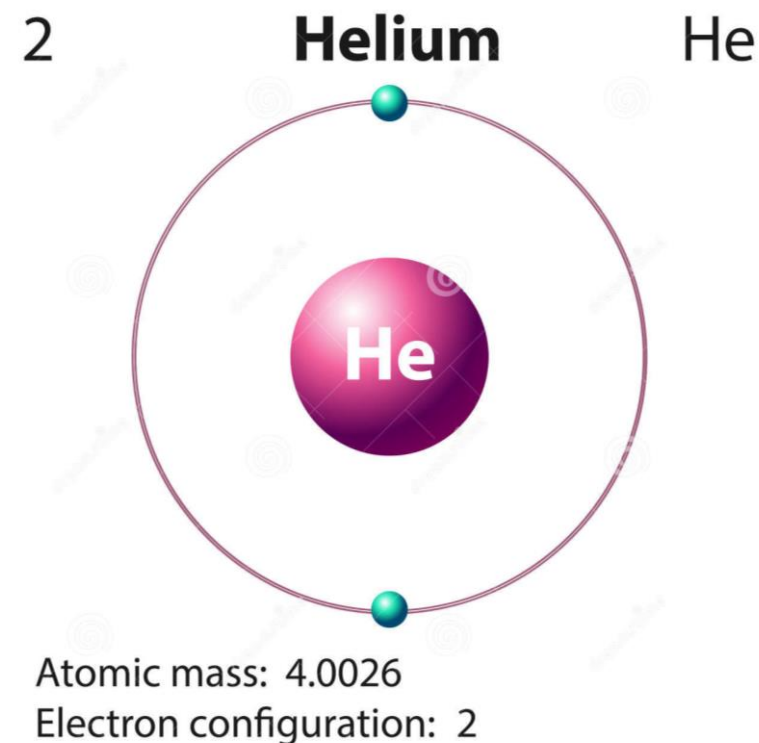
As we go down the group, the metallic character increases because the electron releasing tendency of the atoms tends to increase.

Q) Which one of the following is a monatomic element?

- A. Copper
- B. Helium
- C. Iodine
- D. Barium

Q) Which one of the following is a monatomic element?

- A. Copper
- B. Helium**
- C. Iodine
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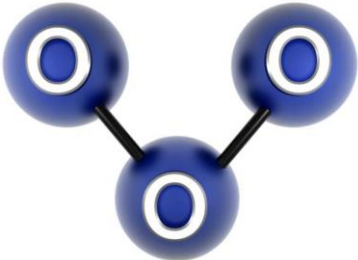


Helium is a monoatomic element. Monatomic elements are the elements that are stable as single atoms.

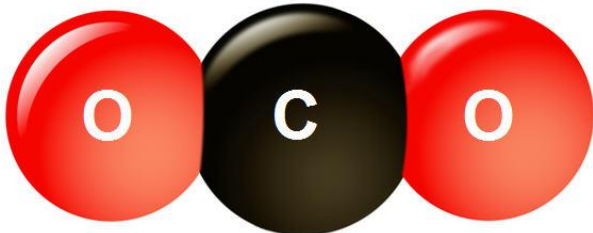
ATOMICITY



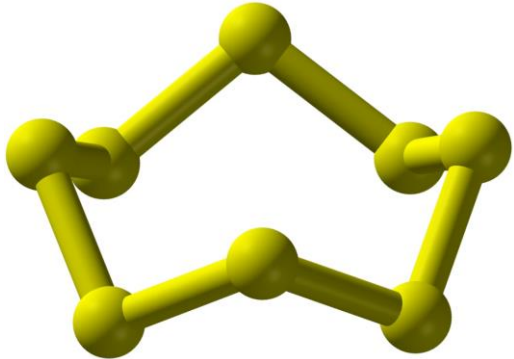
Sodium



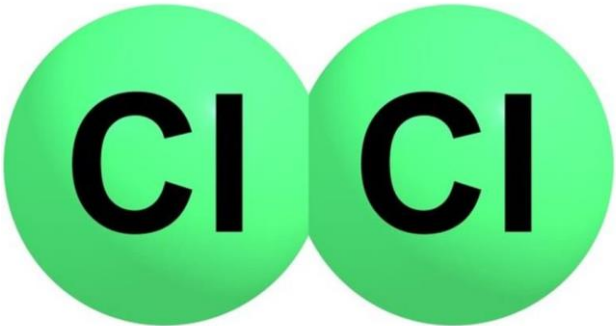
Ozone



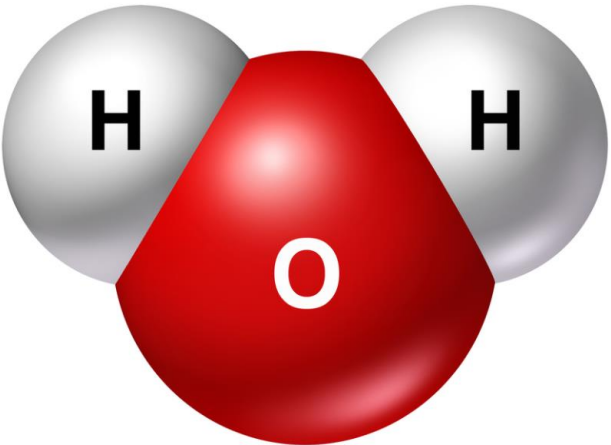
Carbon Dioxide



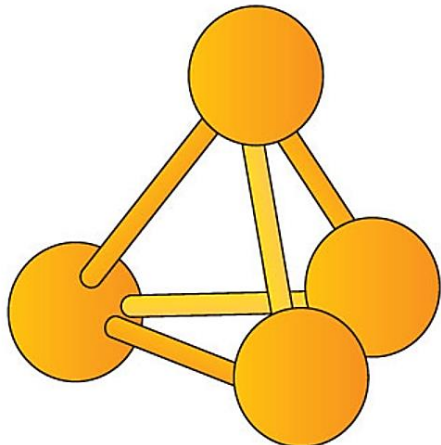
Sulphur



Chlorine



Water



Phosphorous

Q) Which one of the following is the best example of desiccant ?

- A. Silica Gel
- B. Polystyrene
- C. Sodium Chloride
- D. Sodium Carbonate

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- A. Silica Gel
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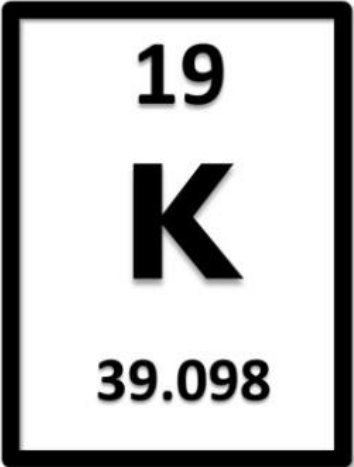
Silica Gel has moisture adsorbing property

Q) Which one of the following is the most fundamental characteristic of an element?

- A. Melting Point
- B. Atomic Number
- C. Colour
- D. Atomic Weight

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- A. Melting Point
- B. Atomic Number**
- C. Colour
- D. Atomic Weight



The diagram shows a box representing the element Potassium (K) with the atomic number 19 and atomic weight 39.098. A red bracket on the right side of the box points to a table of properties.

ATOMIC WEIGHT	39.098
– <u>ATOMIC NUMBER</u>	<u>19</u>
number of neutrons	20.098
<i>(rounded to nearest number = 20)</i>	

Atomic Number is the most fundamental characteristics

Q) Neutrons were discovered by

- A. James Chadwick
- B. Ernest Rutherford
- C. J J Thomson
- D. John Dalton

Q) Neutrons were discovered by

A. James Chadwick

B. Ernest Rutherford

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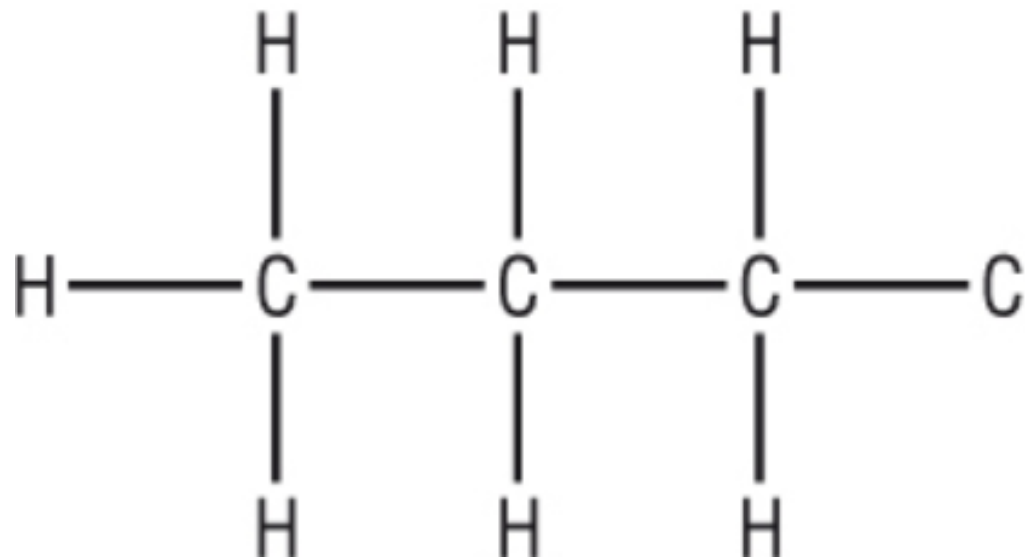
The British physicist Sir James Chadwick discovered neutrons in the year 1932. He was awarded the Nobel Prize in Physics in the year 1935 for this discovery

Q) How many covalent bonds are present in a Chloropropane molecule having molecular formula, C_3H_7Cl ?

- A. 6
- B. 8
- C. 9
- D. 10

Q) How many covalent bonds are present in a Chloropropane molecule having molecular formula, C_3H_7Cl ?

- A. 6
- B. 8
- C. 9
- D. 10**



10 Covalent Bonds are there in chloropropane

Q) The isotopes of Uranium used in atomic reactors is

A. U_{235}

B. U_{236}

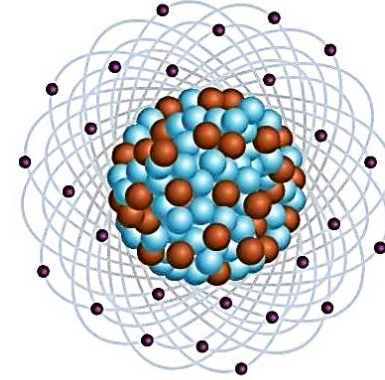
C. U_{237}

D. U_{232}

Q) The isotopes of Uranium used in atomic reactors is

- A. U_{235}
- B. U_{236}
- C. U_{237}
- D. U_{232}

URANIUM-235



● 92 protons ● 143 neutrons

Fewer neutrons—lighter and less stable

Uranium 235, the only existing fissile nucleus found in natural uranium, is used as a nuclear fuel in reactors and as an explosive for nuclear weapons.

Q) Which of the following is not a metalloid?

- A. Boron
- B. Silicon
- C. Germanium
- D. Titanium

Q) Which of the following is not a metalloid?

- A. Boron
- B. Silicon
- C. Germanium
- D. Titanium**

Periodic Table of the Elements

1 IA	2 IIA											13 IIIA	14 IVA	15 VA	16 VIA	17 VIIA	18 VIIIA
1 H												5 B	6 C	7 N	8 O	9 F	10 Ne
3 Li	4 Be											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
11 Na	12 Mg	3 III	4 IV	5 V	6 VI	7 VII	8 VIII	9 VIII	10 VIII	11 VIII	12 VIII	33 As	34 Se	35 Br	36 Kr		
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	51 Sb	52 Te	53 I	54 Xe		
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	83 Bi	84 Po	85 At	86 Rn		
55 Cs	56 Ba	57-71 Lanthanides	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	115 Uup	116 Lv	117 Uus	118 Uuo		
87 Fr	88 Ra	89-103 Actinides	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	69 Tm	70 Yb	71 Lu			
		6 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	101 Md	102 No	103 Lr			
		7 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf						

The most commonly recognised metalloids are boron, silicon, germanium, arsenic, antimony and tellurium. Titanium is a lustrous transition metal with a silver color, low density and high strength.

Q) Charles Goodyear is known for which of the following ?

- A. Experiments on Rubber Plants
- B. Vulcanization of Rubber
- C. Invention of Radial Tyres
- D. Invention of Artificial Rubber

Q) Charles Goodyear is known for which of the following ?

- A. Experiments on Rubber Plants
- B. Vulcanization of Rubber**
- C. Invention of Radial Tyres
- D. Invention of Artificial Rubber



Charles Goodyear, American inventor of the vulcanization process that made possible the commercial use of rubber. Vulcanization is known to improve the thermo-stability and elasticity of the natural rubber.

Q) Which of the following element is NOT an alkaline earth metal?

- A. Magnesium
- B. Strontium
- C. Barium
- D. Potassium

Q) Which of the following element is NOT an alkaline earth metal?

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- B. Strontium
- C. Barium
- D. Potassium**

Group 2 elements are called Alkaline Earth Metals

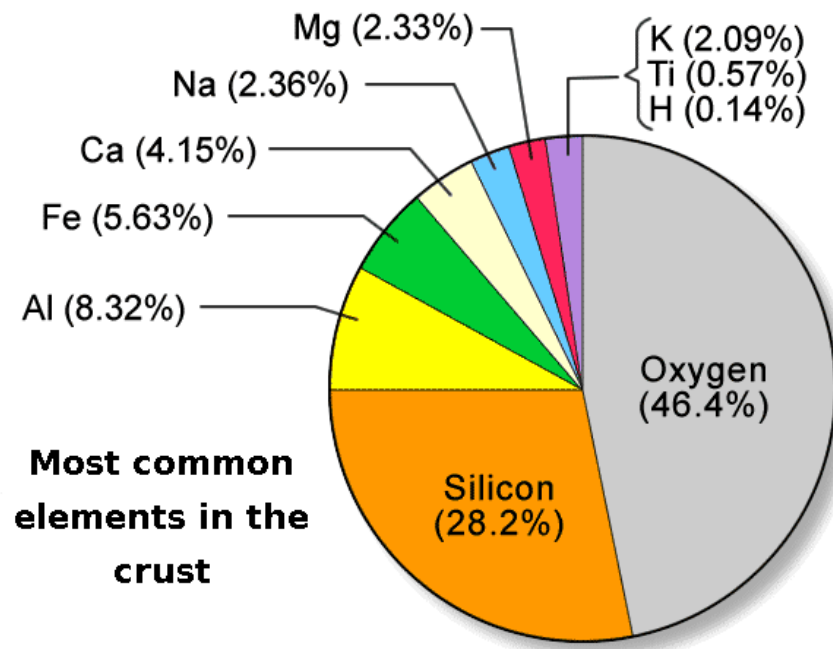
Group→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
↓Period																		
1	1 H																	2 He
2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
3	11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba	* 71 Lu	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7	87 Fr	88 Ra	** 103 Lr	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Fl	115 Uup	116 Lv	117 Uus	118 Uuo
			* 57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb		
			** 89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No		

Q) Which of the following is the correct order of the decreasing order of abundance of the elements in earth's crust?

- A. Iron > Silicon > Oxygen > Aluminium
- B. Oxygen > Silicon > Aluminium > Iron
- C. Oxygen > Iron > Aluminium > Silicon
- D. Iron > Aluminium > Silicon > Oxygen

Q) Which of the following is the correct order of the decreasing order of abundance of the elements in earth's crust?

- A. Iron > Silicon > Oxygen > Aluminium
- B. Oxygen > Silicon > Aluminium > Iron**
- C. Oxygen > Iron > Aluminium > Silicon
- D. Iron > Aluminium > Silicon > Oxygen



Oxygen is the most abundant element in the earth's crust followed by Silicon, Aluminium and Iron. It comprises almost half of the mass of the earth's crust.

Q) The Poisonous nature of Carbon monoxide (CO) is due to its

- A. Insolubility in water
- B. Ability to form a complex with hemoglobin
- C. Ability to reduce some metal oxides
- D. Property of having one sigma bond

Q) The Poisonous nature of Carbon monoxide (CO) is due to its

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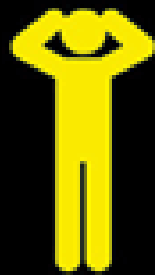
B. Ability to form a complex with hemoglobin

C. Ability to reduce some metal oxides

D. Property of having one sigma bond

The poisonous nature of carbon monoxide is due to its ability to form a complex with haemoglobin. Carbon monoxide is harmful when breathed because it displaces oxygen in the blood

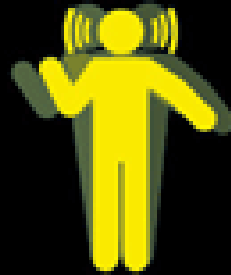
Signs of carbon monoxide poisoning



Headaches



Nausea



Dizziness



Breathlessness



Collapse



Loss of
consciousness

Q) The accidental touch of nettle leaves creates a burning sensation, which is due to inject of

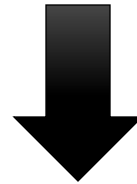
- A. Hydrochloric acid
- B. Methanoic acid
- C. Citric acid
- D. Sulphuric acid

Q) The accidental touch of nettle leaves crates a burning sensation, which is due to inject of

- A. Hydrochloric acid
- B. Methanoic acid**
- C. Citric acid
- D. Sulphuric acid

Nature provides neutralisation options

Nettle Plant
(Acidic)



Dock Plant (Basic)



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Q) Which one of the following is a tribasic acid ?

A. Hydrochloric acid

B. Nitric acid

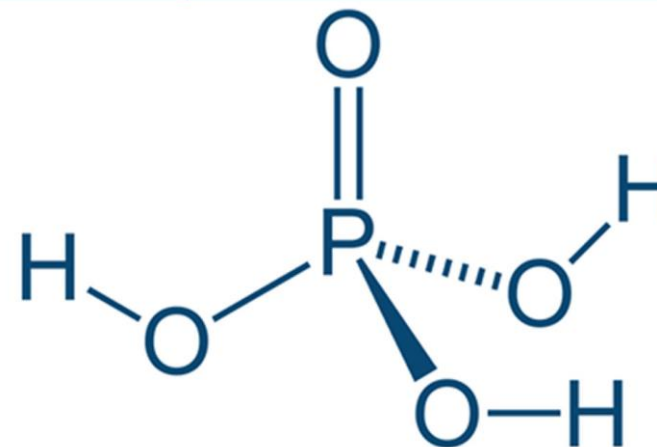
C. Sulphuric acid

D. Phosphoric acid

Q) Which one of the following is a tribasic acid ?

- A. Hydrochloric acid
- B. Nitric acid
- C. Sulphuric acid
- D. Phosphoric acid**

Phosphoric Acid Structure



Tribasic acid has three hydrogen ions to donate to a base in a reaction of acid-base.

Q) On exposure to moist air, copper gains a green coat on its surface due to formation of which one of the following compounds ?

- A. Copper carbonate
- B. Copper oxide
- C. Copper sulphate
- D. Copper Nitrate

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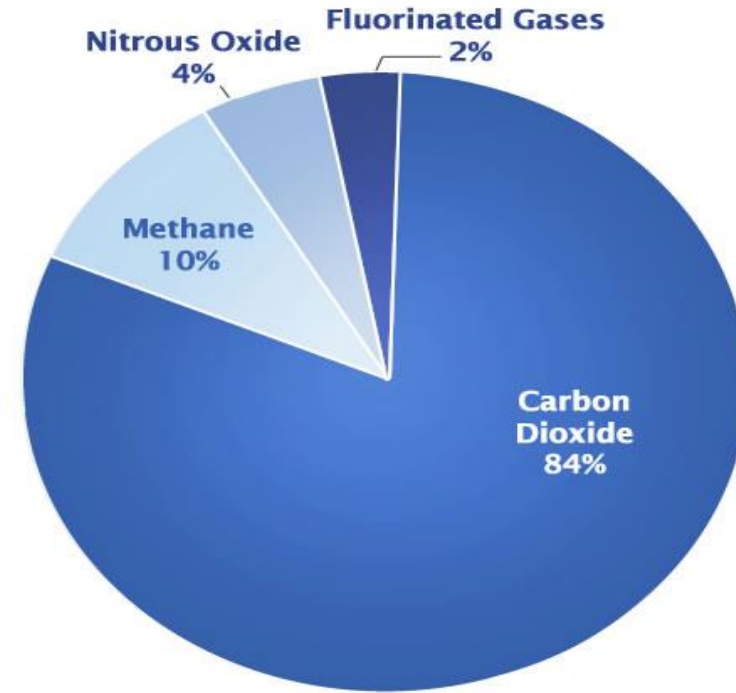
The copper metal reacts with oxygen, resulting in the formation of an outer layer of copper oxide, which appears green or bluish-green in color. This layer is known as the patina.

Q) Which one of the following greenhouse gases is in largest concentration in the atmosphere ?

- A. Chlorofluorocarbon
- B. Nitrous oxide
- C. Carbon dioxide
- D. Methane

Q) Which one of the following greenhouse gases is in largest concentration in the atmosphere ?

- A. Chlorofluorocarbon
- B. Nitrous oxide
- C. Carbon dioxide**
- D. Methane



Carbon dioxide is present in the largest concentration in atmosphere. It is around 400 ppm in concentration in atmosphere.

Q) Which one of the following is an example of a clean fuel?

- A. Coke
- B. Propane
- C. Petrol
- D. Wax

Q) Which one of the following is an example of a clean fuel?

A. Coke

B. Propane

C. Petrol

D. Wax

Propane	C_3H_8	48%
Butane	C_4H_{10}	50%
Pentane	C_5H_{12}	02%

Propane, also known as Liquefied Petroleum Gas (LPG) is a clean burning fuel. It used to power lights, and heavy-duty propane vehicles. Propane consists of three-carbon alkane gas (C_3H_8), colorless and odorless.

Q) In which of the following pairs are the ions isoelectronic ?

A. Mg^{2+} , Ar

B. Na^+ , O^{2-}

C. Al^{3+} , Cl^-

D. K^+ , Ne

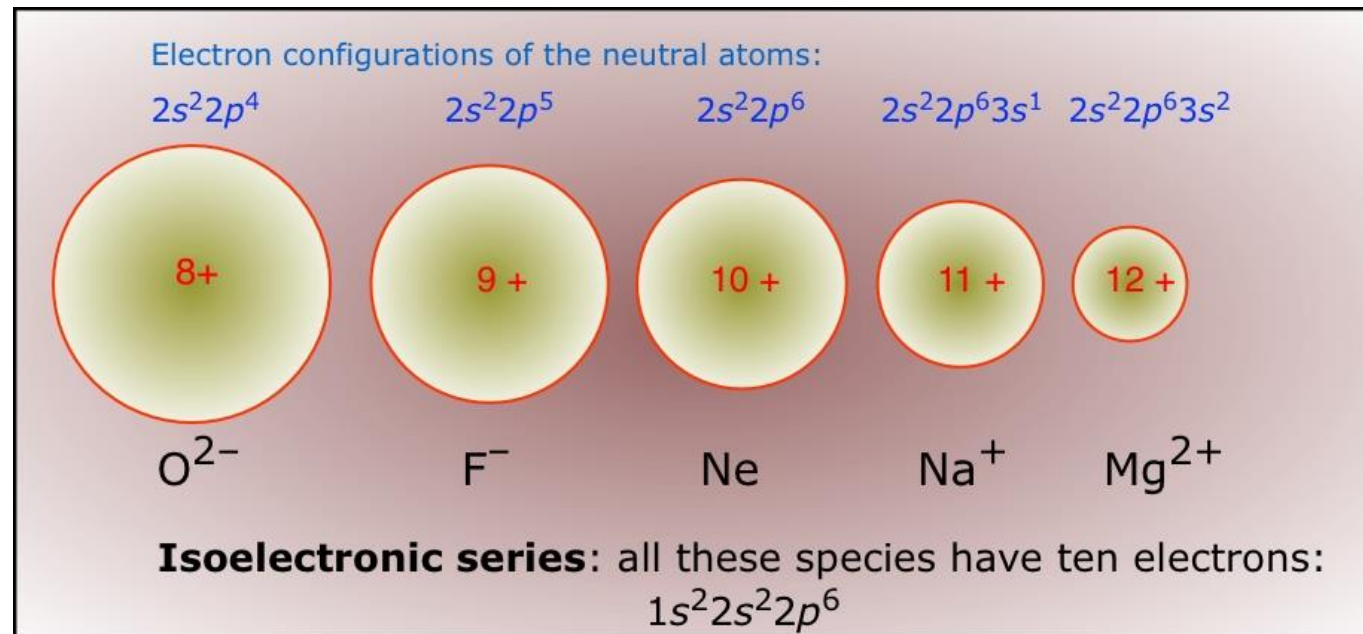
Q) In which of the following pairs are the ions isoelectronic ?

A. Mg^{2+} , Ar

B. Na^+ , O^{2-}

C. Al^{3+} , Cl^-

D. K^+ , Ne



Isoelectronic refers to two ions having the same number of electrons structure and same number of valence electrons. Na^+ and O^{2-} are isoelectronic with the structure 2, 8.

Q) Which one of the following is the chemical of washing Soda?

A. NaHCO_3

B. $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$

C. $\text{Na}_2\text{CO}_3 \cdot 5\text{H}_2\text{O}$

D. NaOH

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D. NaOH

Washing Soda

- **Common Name:** Washing Soda
- **Chemical Formula:** $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$
- **Chemical Name:** Sodium Carbonate Deca Hydrate
- **Preparation:**



Sodium carbonate is prepared by heating baking soda. On re-crystallisation sodium carbonate gives washing soda.



Uses:

- Used in glass, soap and paper industries
- Used in the manufacture of sodium compounds such as borax
- Used as a cleaning agent for domestic purposes
- Used for removing permanent hardness of water

Q) Which one of the following is the number of water molecules that share with two formula unit CaSO_4 in plaster of Paris?

- A. One
- B. Two
- C. Five
- D. Ten

Q) Which one of the following is the number of water molecules that share with two formula unit CaSO_4 in plaster of Paris?

A. One

B. Two

C. Five

D. Ten

On heating Gypsum to 373K, It loses some of the water molecules, and becomes **Calcium Sulphate Hemihydrate**



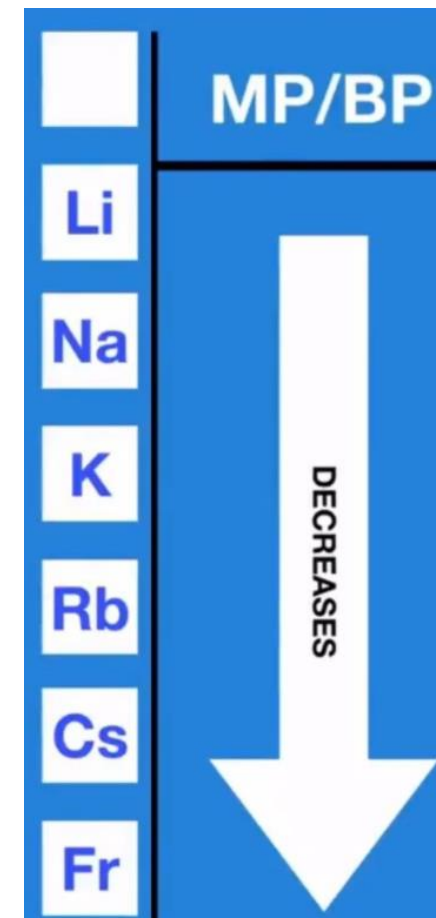
When we heat Gypsum above 373K, POP becomes Anhydrous aka Dead Burnt Plaster

Q) Which one of the following alkali metals has lowest melting point?

- A. Sodium
- B. Potassium
- C. Rubidium
- D. Caesium

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- A. Sodium
- B. Potassium
- C. Rubidium
- D. Caesium**



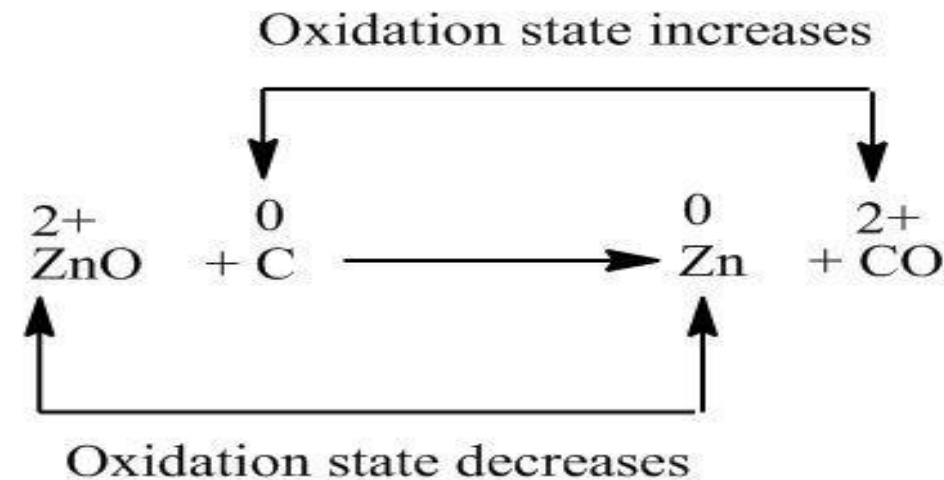
Melting Point & Boiling Point of a metals decreases down the group

Q) In the reaction $\text{ZnO} + \text{C} \rightarrow \text{Zn} + \text{CO}$, 'C' acts as

- A. An acid
- B. A base
- C. An oxidizing agent
- D. A reducing agent

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- A. An acid
- B. A base
- C. An oxidizing agent
- D. A reducing agent**



ZnO = Reduced, oxidizing agent
CO = Oxidized, reducing agent

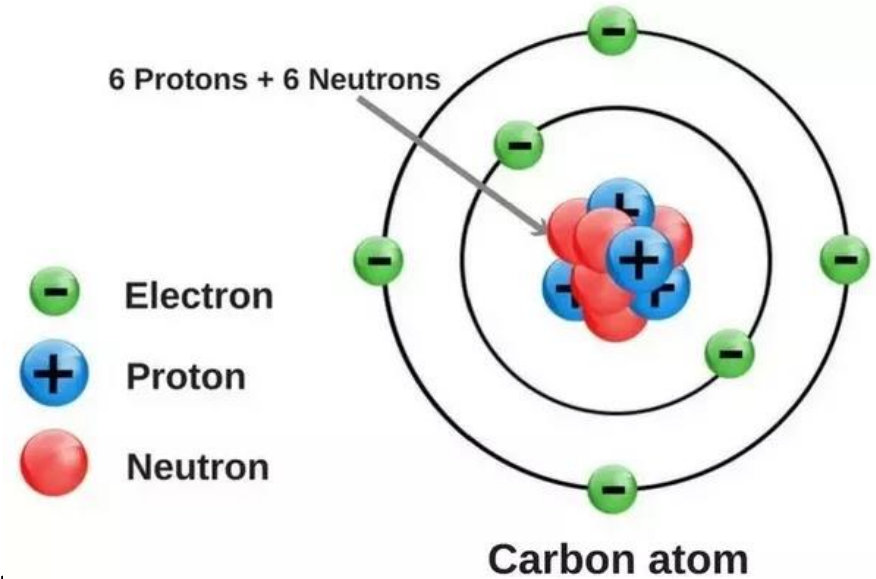
'C' acts as a reducing agent in this reaction. A reducing agent is a substance that loses electrons, making it possible for another substance to gain electrons and be reduced. The oxidized substance is always the reducing agent.

Q) An atom of carbon has 6 protons. Its mass number is 12. How many neutrons are present in an atom of carbon?

- A. 12
- B. 6
- C. 10
- D. 14

Q) An atom of carbon has 6 protons. Its mass number is 12. How many neutrons are present in an atom of carbon?

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- B. 6**
- C. 10
- D. 14



Mass number = number of proton + number of neutron

$$12 = 6 + \text{number of neutron}$$

$$12 - 6 = \text{number of neutron}$$

Number of neutron = 6

Q) Rutherford's alpha-particle scattering experiment was responsible for the discovery of

- A. Electron
- B. Proton
- C. Nucleus
- D. Helium

Q) Rutherford's alpha-particle scattering experiment was responsible for the discovery of

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Rutherford's alpha-particle scattering experiment was responsible for the discovery of Nucleus.

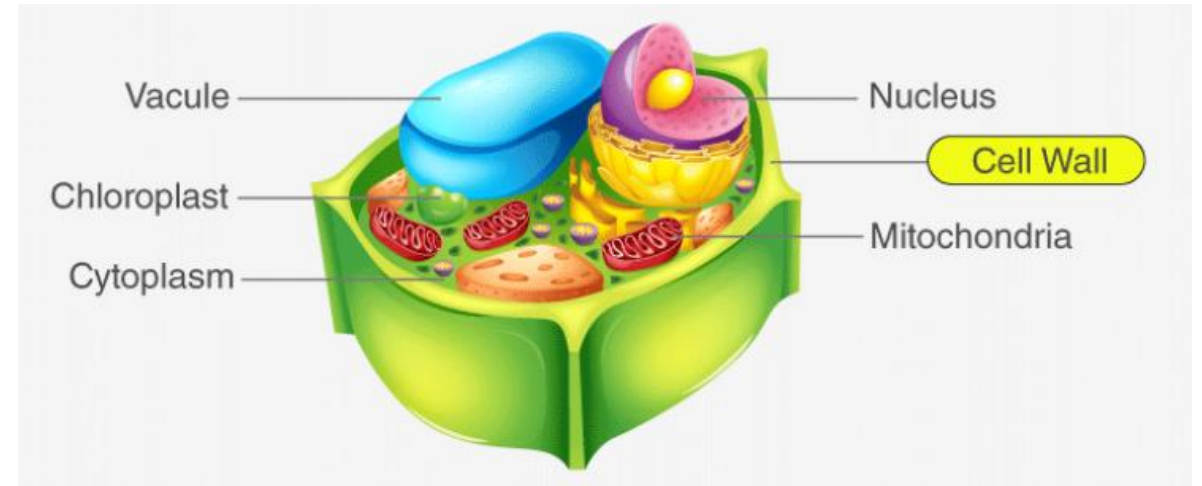
Q. Cell wall is not present in the cells of

- (a) Bacteria
- (b) Plants
- (c) Fungi
- (d) Humans

Q. Cell wall is not present in the cells of

- (a) Bacteria
- (b) Plants
- (c) Fungi
- (d) Humans**

Ans: (d)



Explanation: Humans lack cell wall. Cell walls do not exist in Animalia. Humans, belonging to the Kingdom Animalia, lack cell wall.

Q. Which cell organelles have their own DNA and Ribosomes?

- (a) Golgi body and endoplasmic reticulum
- (b) Mitochondria and Plastids
- (c) Lysosome and Golgi body
- (d) Vacuole and Plastids

Q. Which cell organelles have their own DNA and Ribosomes?

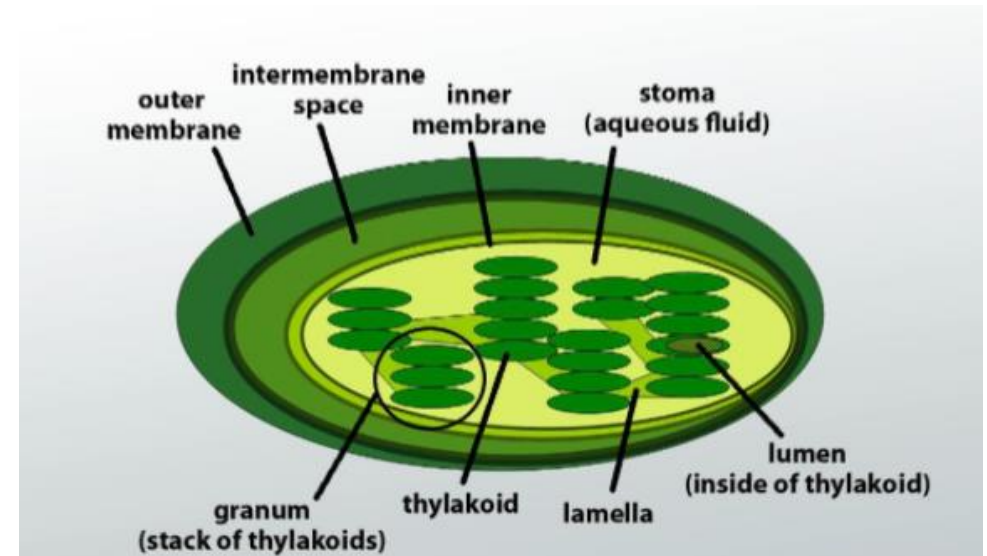
(a) Golgi body and endoplasmic reticulum

(b) Mitochondria and Plastids

(c) Lysosome and Golgi body

(d) Vacuole and Plastids

Ans: (b)



Explanation: Mitochondria and Chloroplasts have their own DNA and Ribosomes.

Q. Which one of the following living organisms has self-consciousness?

- (a) *Homo sapiens*
- (b) *Amoeba*
- (c) *Planaria*
- (d) All the above

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- (a) *Homo sapiens*
- (b) *Amoeba*
- (c) *Planaria*
- (d) All the above

Ans: (a)

Explanation: Human being is the only organism who is aware of himself, i.e., has self-consciousness.

Q. ICVN stands for?

- (a) International Code of Virus Nomenclature
- (b) International Code of Viral Nomenclature
- (c) International Code of Virological Nomenclature
- (d) None of the above

Q. ICVN stands for?

- (a) International Code of Virus Nomenclature
- (b) International Code of Viral Nomenclature**
- (c) International Code of Virological Nomenclature
- (d) None of the above

Ans: (b)

Explanation: ICVN stands for International Code of Viral Nomenclature. This is one of the codes of Biological Nomenclature.

Q. In which one of the following types of connective tissues in animals does fat get stored?

- a) Adipocyte
- b) Chondrocyte
- c) Osteocyte
- d) Reticulocyte

Q. In which one of the following types of connective tissues in animals does fat get stored?

- a) **Adipocyte**
- b) Chondrocyte
- c) Osteocyte
- d) Reticulocyte

Ans: (a)

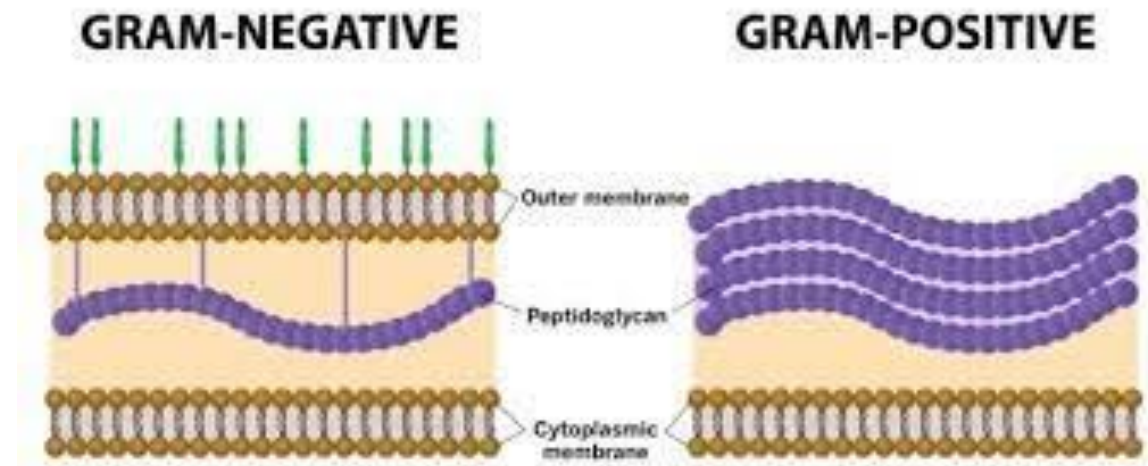
Explanation: Adipocyte is a loose connective tissue that fills up space between organs and tissues and provides structural and metabolic support. It is part of the nutrient glue that holds us all together. **Adipocyte tissue** is often referred to as **fat**.

- Q.** The main difference between gram-positive and gram-negative bacteria lies in?
- (a) Cell membrane
 - (b) Cell wall
 - (c) Cytoplasm
 - (d) None of the above

Q. The main difference between gram-positive and gram-negative bacteria lies in?

- (a) Cell membrane
- (b) Cell wall**
- (c) Cytoplasm
- (d) None of the above

Ans: (b)



Explanation: The main difference between gram-positive and gram-negative bacteria lies in the cell wall which plays a role in the absorption of the stain.

Q. Prokaryotic unicellular organisms are included under the Kingdom?

- (a) Monera
- (b) Protista
- (c) Fungi
- (d) Plantae

Q. Prokaryotic unicellular organisms are included under the Kingdom?

- (a) **Monera**
- (b) Protista
- (c) Fungi
- (d) Plantae

Ans: (a)

Explanation: Kingdom Monera includes all the unicellular prokaryotic organisms.

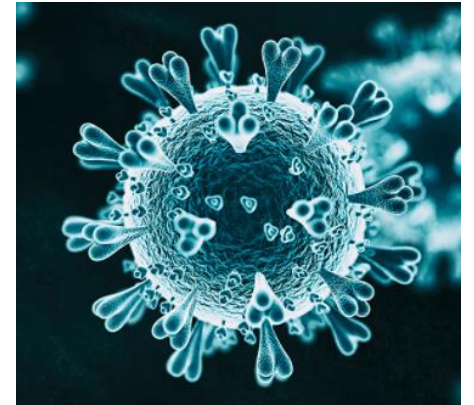
Q. Which one of the following regarding viruses is not true?

- a) Viruses need living cells to reproduce
- b) All viruses are parasites
- c) Viruses can synthesize their food through photosynthesis
- d) Viruses are similar to chemical substances outside their host

Q. Which one of the following regarding viruses is not true?

- a) Viruses need living cells to reproduce
- b) All viruses are parasites
- c) Viruses can synthesize their food through photosynthesis**
- d) Viruses are similar to chemical substances outside their host

Ans: (c)



Explanation: Viruses cannot synthesize their food through photosynthesis because they do not contain chlorophyll as they are non- living outside the host's body.

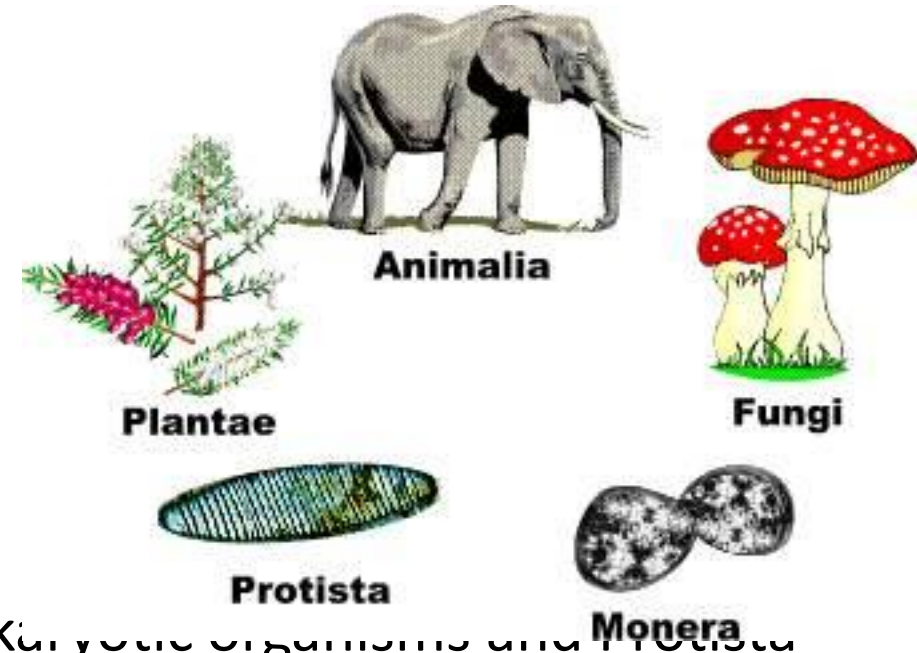
Q. Which of the following Kingdoms has/have only unicellular organisms?

- a) Monera only
- b) Protista only
- c) Monera and Protista
- d) Protista and Fungi

Q. Which of the following Kingdoms has/have only unicellular organisms?

- a) Monera only
- b) Protista only
- c) Monera and Protista**
- d) Protista and Fungi

Ans: (c)



Explanation: Monera includes unicellular prokaryotic organisms and Protista includes unicellular eukaryotic organisms.

Q. Malarial parasite is a?

- a) bacteria
- b) protozoan
- c) virus
- d) fungus

Q. Malarial parasite is a?

- a) bacteria
- b) protozoan**
- c) virus
- d) fungus

Ans: (b)

Explanation: Malarial parasite is *Plasmodium*. It belongs to sporozoan group which in turn belongs to Protozoan.

Q. Which one of the following organisms is dependent on saprophytic mode of nutrition?

- a) *Agaricus*
- b) *Ulothrix*
- c) *Riccia*
- d) *Cladophora*

Q. Which one of the following organisms is dependent on saprophytic mode of nutrition?

- a) *Agaricus*
- b) *Ulothrix*
- c) *Riccia*
- d) *Cladophora*

Ans: (a)

Explanation: Among the following, *Agaricus* is a fungus. Fungi shows saprophytic mode of nutrition. It feeds on dead plant and animal remains.

HETEROTROPHIC



Holozoic Nutrition

- The organism feed by ingesting solid organic matter which is then digested and absorbed into their bodies.
- Eg. human, animals and insectivorous plants



Saprophytism

- Saprophytes.
- Feed on dead and decaying matter.
- Include bacteria and fungi which digest the food externally before the nutrients are absorbed.



Parasitism

- Obtains nutrients from living organisms
- The parasite obtains nutrients by living on or in the body of the host.
- Eg. fleas, lice and tapeworms

Q. AIDS is caused by the Human Immunodeficiency Virus (HIV). The transmission of HIV Infection generally occurs through

- a) eating contaminated food and water
- b) transfusion of contaminated blood and blood products.
- c) inhaling polluted air
- d) shaking hand with an infected person.

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- a) eating contaminated food and water
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- c) inhaling polluted air
- d) shaking hand with an infected person.

Ans: (b)

Explanation: It is spread through contaminated blood and blood products, through contaminated syringes, etc.



Q. Most viruses that infect plants possess

- a) single-stranded DNA
- b) single-stranded RNA
- c) double-stranded DNA and RNA
- d) double-stranded RNA only

Q. Most viruses that infect plants possess

- a) single-stranded DNA
- b) single-stranded RNA**
- c) double-stranded DNA and RNA
- d) double-stranded RNA only

Ans: (b)

Explanation: Viruses that infect plants possess single stranded RNA whereas the viruses that infect animals possess single stranded or double stranded DNA or RNA.

Q. Cell wall of Chlorophyceae is made up of the following?

- (a) Cellulose and Pectose
- (b) Cellulose and Pectin
- (c) Cellulose and Pentose
- (d) None of the above

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- (a) Cellulose and Pectose**
- (b) Cellulose and Pectin
- (c) Cellulose and Pentose
- (d) None of the above

Ans: (a)

Explanation: Green algae usually have a rigid cell wall made of an inner layer of cellulose and an outer layer of pectose.

Q. Flask-shaped archegonium is found in

- (a) Algae
- (b) Bryophytes
- (c) Pteridophytes
- (d) Gymnosperms

Q. Flask-shaped archegonium is found in

- (a) Algae
- (b) Bryophytes**
- (c) Pteridophytes
- (d) Gymnosperms

Ans: (b)



Explanation: In Bryophytes, the female sex organ called archegonium is flask-shaped and produces a single egg.

Q. Which one of the following is the scientific name of the causal organism of elephantiasis?

- a) *Ascaris lumbricoides*
- b) *Culex pipiens*
- c) *Wuchereria bancrofti*
- d) *Fasciola hepatica*

Q. Which one of the following is the scientific name of the causal organism of elephantiasis?

- a) *Ascaris lumbricoides*
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- c) ***Wuchereria bancrofti***
- d) *Fasciola hepatica*

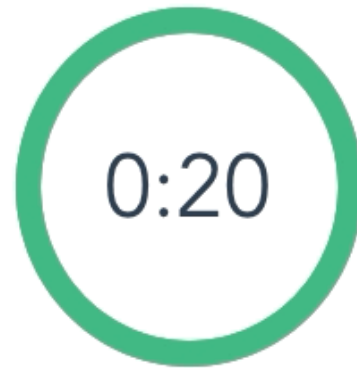
Ans: (c)



Explanation: *Wuchereria bancrofti* causes elephantiasis. It is also called as Filarial worm

Q. Which one of the following is cold-blooded?

- a) Dolphin
- b) Shark
- c) Whale
- d) Porpoise



Q. Which one of the following is cold-blooded?

- a) Dolphin
- b) Shark**
- c) Whale
- d) Porpoise

Ans: (b)

Explanation: Shark belongs to Chondrichthyes which include cold-blooded or poikilothermic animals.



Cold blooded

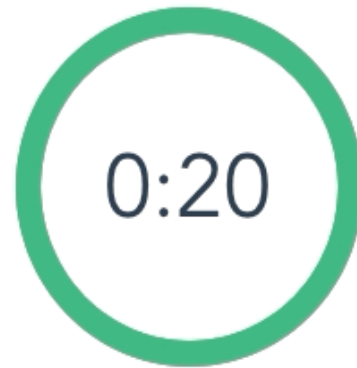


Warm blooded



Q. Which of the following groups is the most abundant in terms of number of species identified?

- a) Fungi
- b) Green plants
- c) Bacteria
- d) Insects



Q. Which of the following groups is the most abundant in terms of number of species identified?

- a) Fungi
- b) Green plants
- c) Bacteria
- d) Insects**

Ans: (d)



Explanation: The largest number of species identified belong to Insects or Arthropoda. It is the largest phylum.

Q. Which one of the following animals does not undergo periodic moulting of their external body covering?

- a) Cockroach
- b) Cobra
- c) Earth worm
- d) Dragon fly

Q. Which one of the following animals does not undergo periodic moulting of their external body covering?

- a) Cockroach
- b) Cobra
- c) Earth worm**
- d) Dragon fly

Ans: (c)



Explanation: Earthworm does not undergo periodic moulting of their external body covering. Rest all the animals are examples of arthropods which undergo periodic ecdysis (casting of skin).

Q. Match List I with List II and select the correct answer using the code given below the lists

List I

(Cell Organelle)

A. Mitochondria

B. Chloroplast

C. Ribosomes

D. Lysosomes

List II

(Function)

1. Photosynthesis

2. Protein synthesis

3. Intracellular digestion

4. ATP

Code:

A B C D

a) 3 1 2 4

b) 3 2 1 4

c) 4 1 2 3

d) 4 2 1 3

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Code:

A B C D

a) 3 1 2 4

b) 3 2 1 4

c) 4 1 2 3

d) 4 2 1 3

Ans: (c)

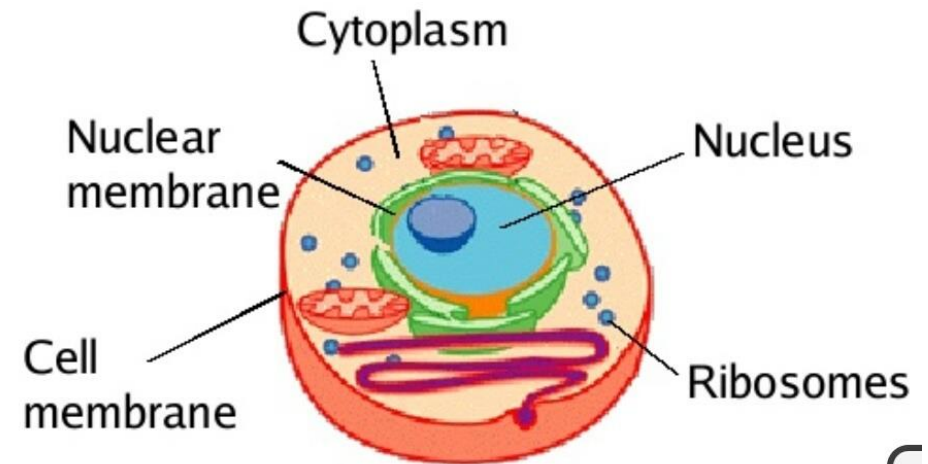
Q. The living content of the cell is called Protoplasm. It is composed of.

- a) Cytoplasm
- b) Cytoplasm and Nucleoplasm
- c) Nucleoplasm only
- d) Cytoplasm, nucleoplasm, and organelles

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- a) Cytoplasm
- b) Cytoplasm and Nucleoplasm
- c) Nucleoplasm only
- d) Cytoplasm, nucleoplasm, and organelles**













Ans: (d)



Explanation: The living content of the cell is Protoplasm and it surrounds the cytoplasm, nucleoplasm and Organelles.

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