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# NDA 2 2022

## COMPLETE

## CHEMISTRY & BIOLOGY

**LIVE**  **CLASS**



**Q) The cleaning action of soap and detergent in water is due to the formation of**

- A. Micelle
- B. Salt
- C. Base
- D. Acid

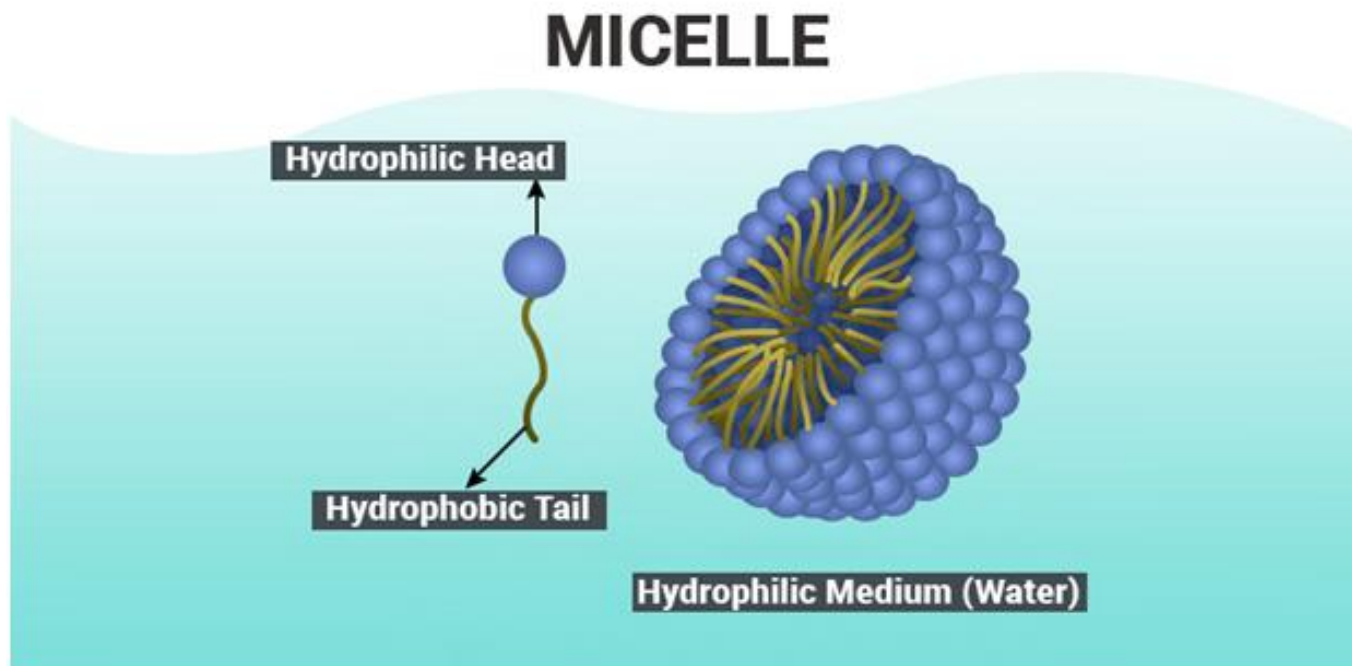
Q) The cleaning action of soap and detergent in water is due to the formation of

A. Micelle

B. Salt

C. Base

D. Acid



A spherical aggregate of soap molecules in the soap solution in water is called micelle. When soap is dissolved in water, it forms a colloidal suspension in which the soap molecules cluster together to form spherical micelles.

**Q) Which one among the following is used in making gunpowder ?**

- A. Magnesium sulphate
- B. Potassium nitrate
- C. Sodium stearate
- D. Calcium sulphate



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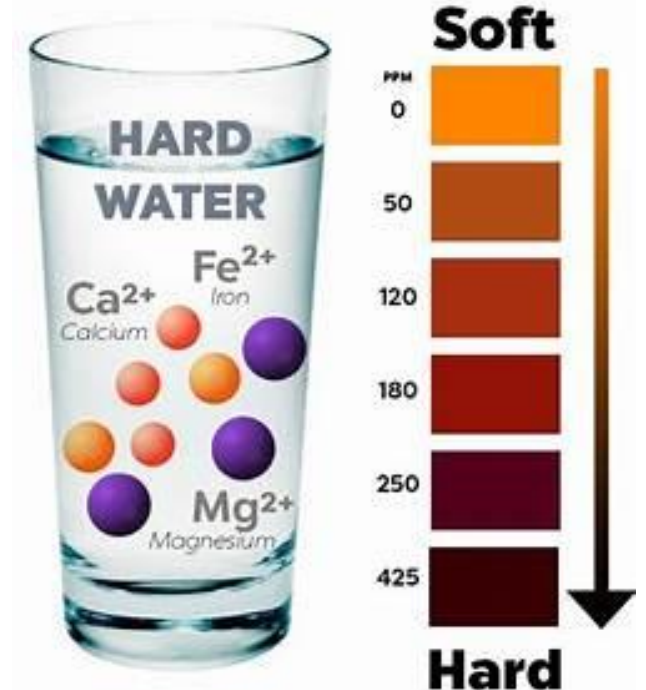
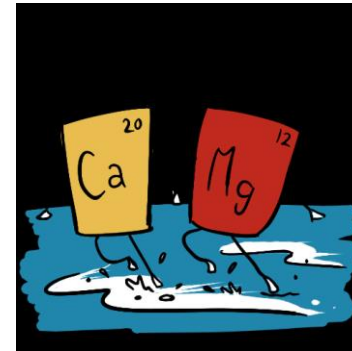
Gunpowder is a mixture of sulfur, charcoal, and potassium nitrate (saltpeter)

**Q) Permanent hardness of water is due to the presence of**

- A. Sulphates of sodium and potassium
- B. Sulphates of magnesium and calcium
- C. Carbonates of sodium and magnesium
- D. Bicarbonates of magnesium and calcium

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- A. Sulphates of sodium and potassium
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- D. Bicarbonates of magnesium and calcium



Permanent hardness of water is usually caused by the presence of calcium sulfate and/or magnesium sulfates in the water.

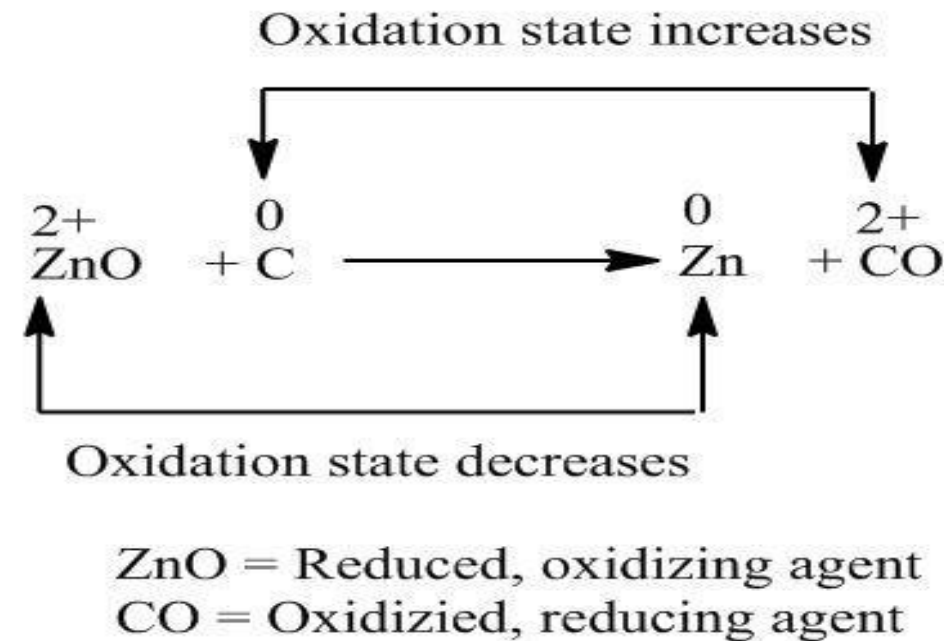


**Q) In the reaction  $\text{ZnO} + \text{C} \rightarrow \text{Zn} + \text{CO}$ , 'C' acts as**

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

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'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) To weld metals together, high temperature is required. Such a high temperature is obtained by burning:**

- A. Acetylene in oxygen
- B. LPG in oxygen
- C. Methane in oxygen
- D. Acetylene in nitrogen

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- A. Acetylene in oxygen**
- B. LPG in oxygen
- C. Methane in oxygen
- D. Acetylene in nitrogen

Note: Acetylene =  $C_2H_2$

Oxy-fuel welding (commonly called oxyacetylene welding, oxy welding, or gas welding) and oxy-fuel cutting are processes that use fuel gases and oxygen to weld and cut metals.



**Q) Match List I with List II and select the correct answer using the code given below the Lists:**

**List I (Element)**

**List II(Use)**

**A. Li**

**1. Time keeper in atomic clocks**

**B. Na**

**2. Batteries**

**C. K**

**3. Transfer of nerve impulses**

**D. Cs**

**4. Control of the water content in the blood**

**Code: A B C D**

**A. 2 4 3 1**

**B. 2 3 4 1**

**C. 1 2 3 4**

**D. 1 3 2 4**

**Q) Match List I with List II and select the correct answer using the code given below the Lists:**

**List I (Element)**

**List II(Use)**

- |              |   |
|--------------|---|
| <b>A. Li</b> | <b>1. Time keeper in atomic clocks</b>              |
| <b>B. Na</b> | <b>2. Batteries</b>                                 |
| <b>C. K</b>  | <b>3. Transfer of nerve impulses</b>                |
| <b>D. Cs</b> | <b>4. Control of the water content in the blood</b> |

Code: A B C D

**A. 2 4 3 1**

B. 2 3 4 1

C. 1 2 3 4

D. 1 3 2 4



**Q) The symbol of the element 'Tungsten' is:**

- A. Ta
- B. W
- C. TI
- D. Tc

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- A. Ta
- B. W**
- C. TI
- D. Tc

Symbol of Tungsten is W.



**Q) Which one of the following statements is correct?**

- A. Rutherford's alpha-particle scattering experiment led to the discovery of electron.
- B. J J Thomson suggested that the nucleus of an atom contains protons
- C. The atomic number of an element is the same as the number of protons in the nucleus of its atom
- D. The mass number of an atom is equal to the number of electrons in its shells

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- C. The atomic number of an element is the same as the number of protons in the nucleus of its atom.**
- D. The mass number of an atom is equal to the number of electrons in its shells.

**Q) The alkali metals have relatively low melting point. Which one of the following alkali metals is expected to have the highest melting point?**

- A. Li
- B. Na
- C. K
- D. Rb

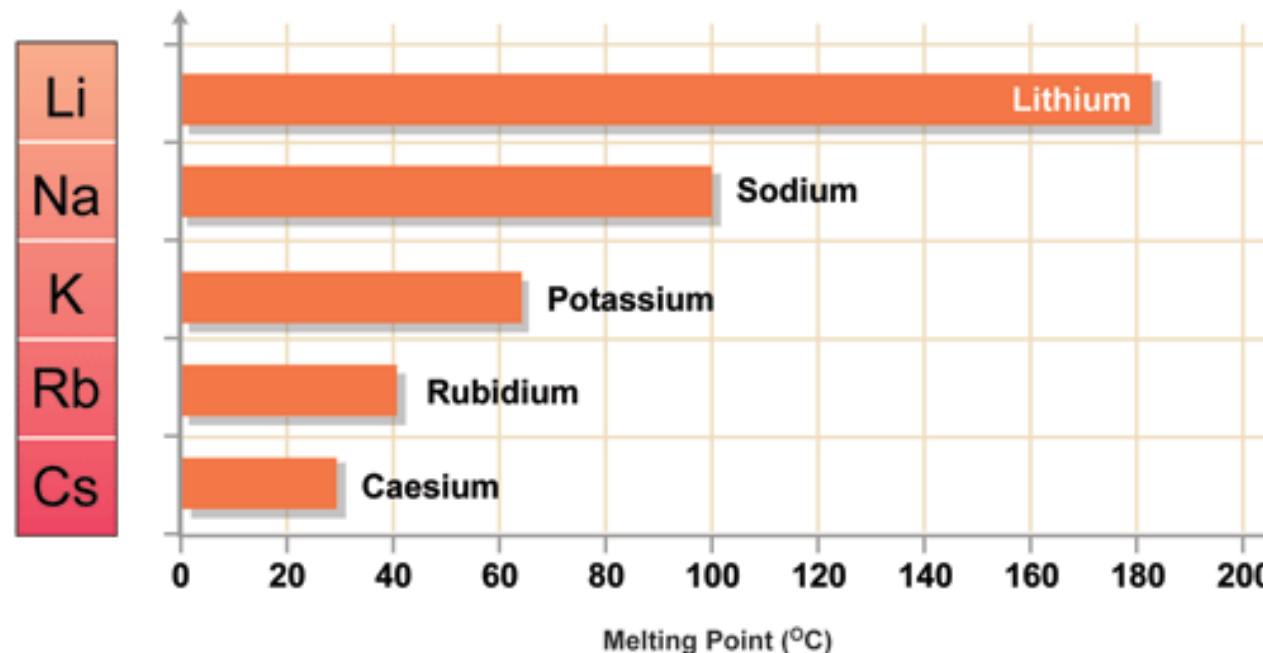
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A. Li

B. Na

C. K

D. Rb



Li is the alkali metal which has highest melting point.



**Q) The main constituent of Vinegar is:**

- A. Acetic acid
- B. Ascorbic acid
- C. Citric acid
- D. Tartaric acid

Q) The main constituent of Vinegar is:

A. Acetic acid

B. Ascorbic acid

C. Citric acid

D. Tartaric acid

Item	Composition, g · kg <sup>-1</sup>
Total organic content	113.7
Acetic acid	28.7
Methanol	0.7
Formaldehyde	0.03
Phenol	1.77
Cresol	0.43
Tar	7.3
pH	3.25

The main constituent of vinegar is acetic acid; the other constituents will depend on the nature of the raw material that has undergone fermentation.

**Q) Which one of the following is not a chemical change?**

- A. Ripening of fruits
- B. Curdling of milk
- C. Freezing of water
- D. Digestion of food

**Q) Which one of the following is not a chemical change?**

- A. Ripening of fruits
- B. Curdling of milk
- C. Freezing of water**
- D. Digestion of food

Freezing of water is not a chemical change as ice when melt changes back to water showing physical change.

**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

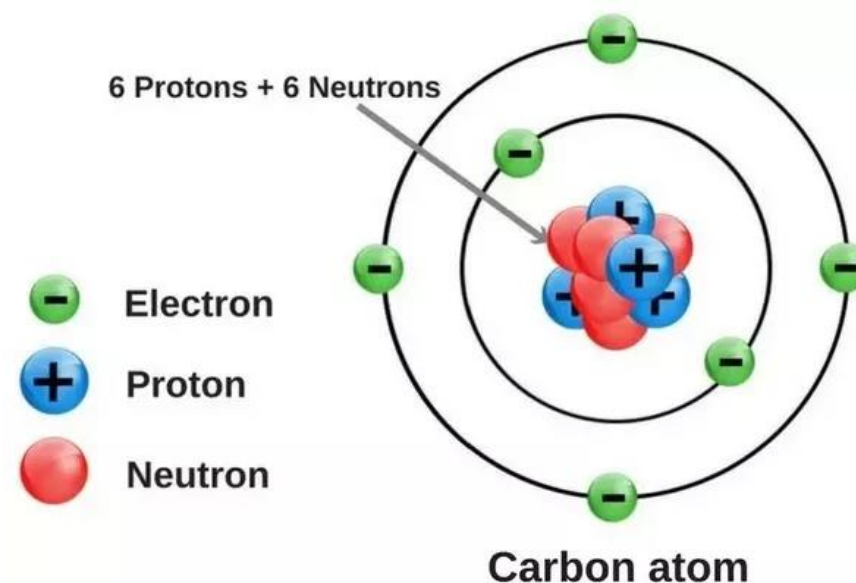
**Q) An atom of carbon has 6 protons. Its mass number is 12. How many neutrons are present in an atom of carbon?**

A. 12

**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) Which one of the following carbon compounds will not give a sooty flame?**

- A. Benzene
- B. Hexane
- C. Naphthalene
- D. Anthracene

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- A. Benzene
- B. Hexane**
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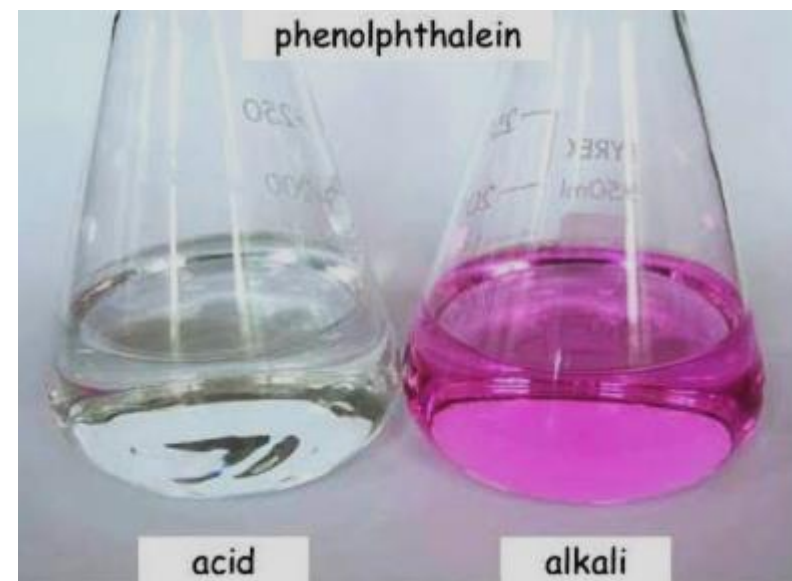
Hexane do not give sooty flame as it is alkane and saturated compound where as Benzene, Naphthalene and Anthracene are aromatic and unsaturated so they give sooty flame.

**Q) Suppose you have four test tubes labelled as 'A', 'B', 'C', and 'D'. 'A' contains plain water, 'B' contains solution of an alkali, 'C' contains solution of an acid, and 'D' contains solution of sodium chloride. Which one of these solutions will turn phenolphthalein solution pink?**

- A. Solution 'A'
- B. Solution 'B'
- C. Solution 'C'
- D. Solution 'D'

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- A. Solution 'A'
- B. Solution 'B'**
- C. Solution 'C'
- D. Solution 'D'



Phenolphthalein is clear in acidic solution and pink in the basic solution.

**Q) Which one of the following elements will not react with dilute HCl to produce  $H_2$ ?**

A. Hg

B. Al

C. Mg

D. Fe

Q) Which one of the following elements will not react with dilute HCl to produce  $H_2$ ?

A. Hg

B. Al

C. Mg

D. Fe

Mercury does not give  $H_2$  reacting with dil. HCl.



Metals		Reactivity
Potassium		Reacts with water
Sodium		
Lithium		
Barium		
Strontium		
Calcium		
Magnesium		Reacts with acids
Aluminium		
Manganese		
Zinc		
Chromium		
Iron		
Cadmium		
Cobalt		
Nickel		
Tin		
Lead		Included for comparison
Hydrogen		Highly unreactive
Antimony		
Bismuth		
Copper		
Mercury		
Silver		
Gold		
Platinum		

**Q) Match List I with List II and select the correct answer using the code given below the Lists:**

<b>List I (Elements)</b>	<b>List II(Highest Valency)</b>
--------------------------	---------------------------------

<b>A. Sulfur</b>	<b>1. Five</b>
------------------	----------------

<b>B. Phosphorous</b>	<b>2. Six</b>
-----------------------	---------------

<b>C. Lead</b>	<b>3. Two</b>
----------------	---------------

<b>D. Silver</b>	<b>4. Four</b>
------------------	----------------

**Code: A B C D**

**A.     2 4 1 3**

**B.     2 1 4 3**

**C.     3 1 4 2**

**D.     3 4 1 2**

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**Code: A B C D**

<b>A.</b>	<b>2 4 1 3</b>
-----------	----------------

<b>B.</b>	<b>2 1 4 3</b>
-----------	----------------

<b>C.</b>	<b>3 1 4 2</b>
-----------	----------------

<b>D.</b>	<b>3 4 1 2</b>
-----------	----------------

**Q) Emulsion is known as a**

- A. Colloidal solution of substances having different physical states
- B. True solution
- C. Distillation mixture for making alcohols
- D. Colloidal solution of two liquids

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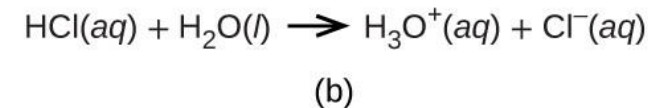
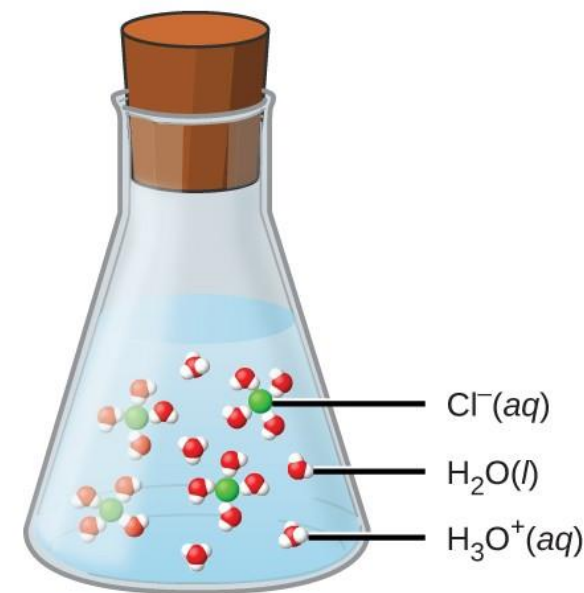
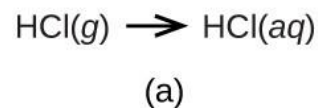
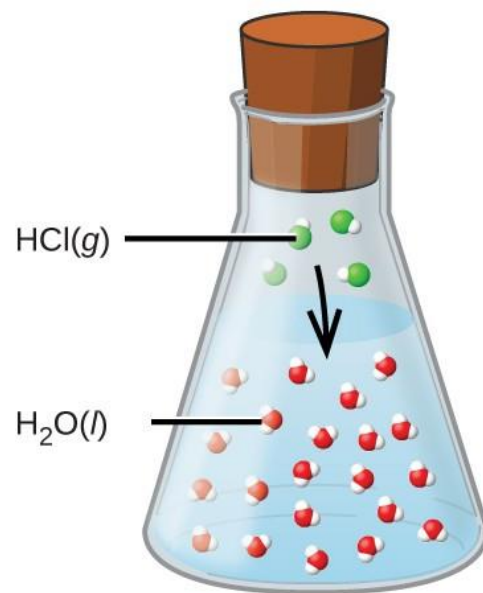
The emulsion is known as a colloidal solution of two liquids.  
Example: Milk, cod liver oil, etc.

**Q) Which one of the following gases gives acidic solution on dissolving in water?**

- A. Hydrogen
- B. Carbon dioxide
- C. Nitrogen
- D. Oxygen

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- A. Hydrogen
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Carbon dioxide ( $\text{CO}_2$ ) gas dissolved in water can cause water to become acidic.  
 $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{CO}_3$  (Carbonic acid)

**Q) Glass is a**

- A. Liquid
- B. Colloid
- C. Non-crystalline amorphous solid
- D. Crystalline solid



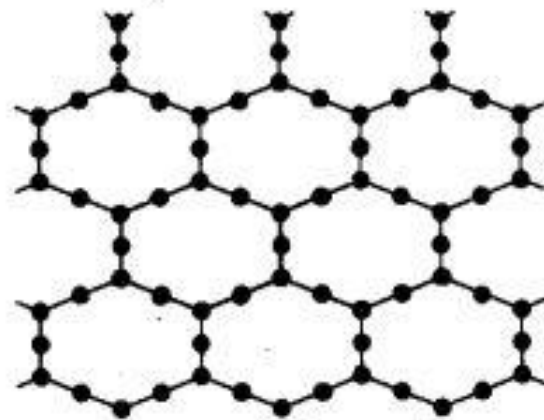
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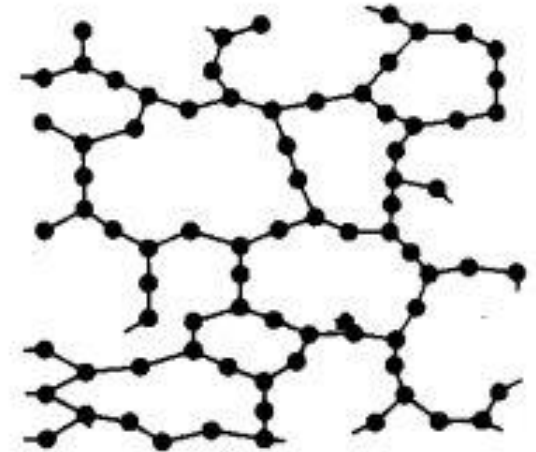
B. Colloid

C. Non-crystalline amorphous solid

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(a)  
Crystalline  
(Quartz)



(b)  
Amorphous  
(Quartz glass)

**Q) Temporary hardness in water is due to which one of the following of Calcium and Magnesium?**

- A. Hydrogen carbonates
- B. Carbonates
- C. Chlorides
- D. Sulphates

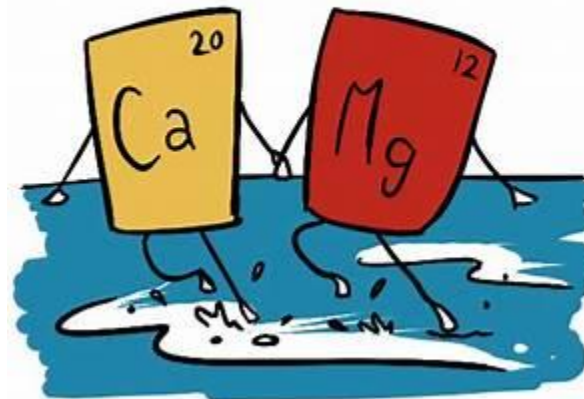
**Q) Temporary hardness in water is due to which one of the following of Calcium and Magnesium?**

**A. Hydrogen carbonates**

B. Carbonates

C. Chlorides

D. Sulphates



Temporary hardness is due to the presence of calcium hydrogen carbonate  $\text{Ca}(\text{HCO}_3)_2$  and magnesium hydrogen carbonate  $\text{Mg}(\text{HCO}_3)_2$ . Both calcium hydrogen carbonate and magnesium hydrogen carbonate decompose when heated.

**Q) Molecules of which of the following has cage like structure?**

**1. Diamond**

**2. Graphite**

**3. Fullerenes**

Select the correct answer using the code given below:

A. 1, 2 and 3

B. 2 and 3 only

C. 2 only

D. 3 only

**Q) Molecules of which of the following has cage like structure?**

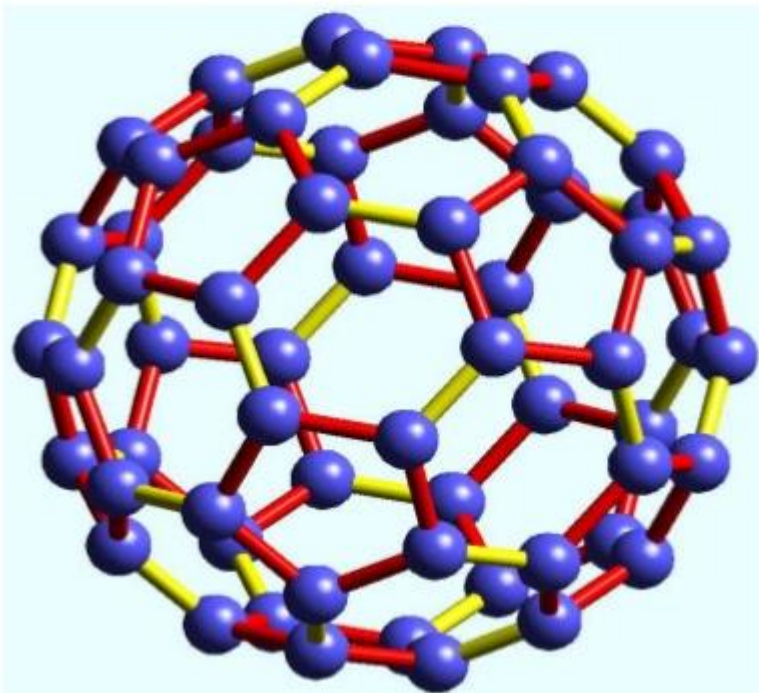
- 1. Diamond**
- 2. Graphite**
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Select the correct answer using the code given below:

- A. 1, 2 and 3
- B. 2 and 3 only
- C. 2 only
- D. 3 only**

Fullerenes structures are based on hexagonal rings of carbon atoms joined by covalent bonds. Some fullerenes include rings with five or seven carbon atoms.

# FULLERENES



**Q) Which one of the following elements forms highest number of compounds?**

- A. Oxygen
- B. Hydrogen
- C. Chlorine
- D. Carbon

**Q) Which one of the following elements forms highest number of compounds?**

- A. Oxygen
- B. Hydrogen
- C. Chlorine
- D. Carbon**



Carbon is the element which forms the highest number of compounds especially organic compounds due to its catenation(long chain formation) ability.



**Q) Which one of the following elements is used in pencil-lead?**

- A. Zinc
- B. Lead
- C. Carbon (Graphite)
- D. Tin

**Q) Which one of the following elements is used in pencil-lead?**

A. Zinc

B. Lead

**C. Carbon (Graphite)**

D. Tin



Pencils contain a form of solid carbon known as graphite

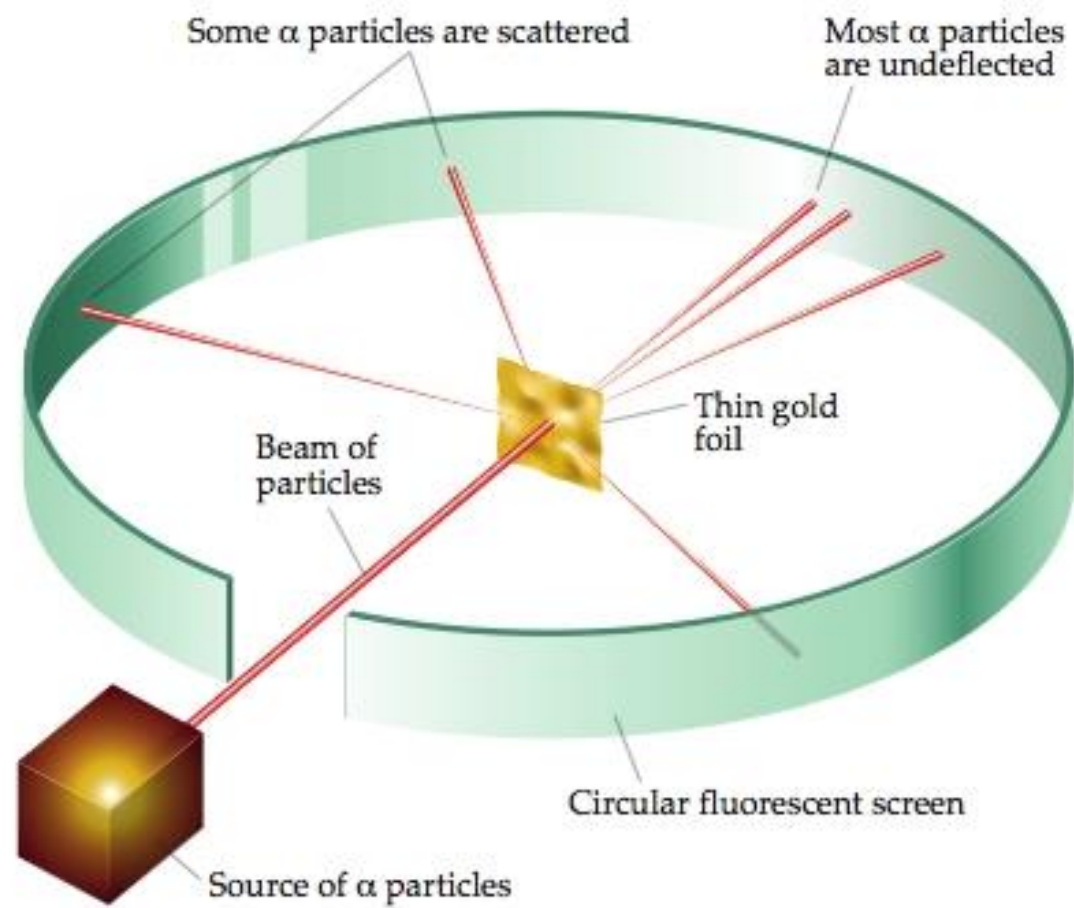
**Q) Rutherford's alpha-particle scattering experiment was responsible for the discovery of**

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

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



**Q) 20 g of common salt is dissolved in 180 g of water. What is the mass percentage of the salt in the solution?**

- A. 5%
- B. 9%
- C. 10%
- D. 15%

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Mass of solute (salt) = 20g

Mass of solvent (water) = 180g

Mass of solution = 20+180= 200g

Concentration = mass of solute/mass of solution x 100

$$= 20 \times 100 / 200$$

$$= 2000 / 200$$

$$= 10\%$$

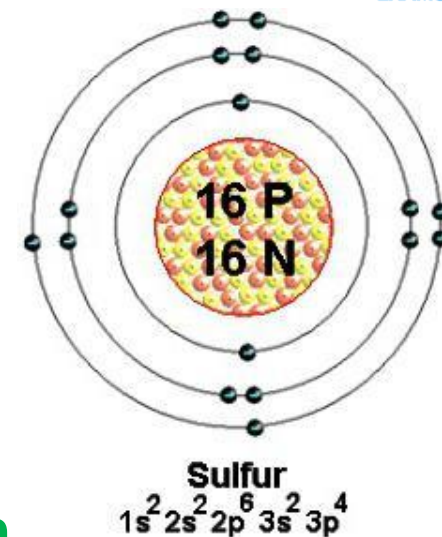
**Q) The valency of an element depends upon the**

- A. total number of protons in an atom
- B. Mass number of an atom
- C. Total number of neutrons in an atom
- D. Total number of electrons in the outer most shell of an atom



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The valency of an element depends upon the total number of electrons in the outer most shell of an atom.

**Q) Match List I with List II and select the correct answer using the code given below the Lists :**

**List I (Noble gas)**

**A. Argon**

**B. Neon**

**C. Krypton**

**D. Xenon**

**List II(Use)**

**1. In lights for advertising display**

**2. Airport landing lights and in light houses**

**3. Light in photographer's flash gun**

**4. In tungsten filament to last longer**

**Code :**

	A	B	C	D
A.	3	1	2	4
B.	3	2	1	4
C.	4	2	1	3
D.	4	1	2	3

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**Code :**

- |           | A        | B        | C        | D        |
|-----------|----------|----------|----------|----------|
| <b>A.</b> | 3        | 1        | 2        | 4        |
| <b>B.</b> | 3        | 2        | 1        | 4        |
| <b>C.</b> | 4        | 2        | 1        | 3        |
| <b>D.</b> | <b>4</b> | <b>1</b> | <b>2</b> | <b>3</b> |

**Q) Radon is**

- A. An inert gas
- B. An artificial fiber
- C. An explosive
- D. A metal

Q) Radon is

- A. An inert gas
- B. An artificial fiber
- C. An explosive
- D. A metal

helium <b>He</b> 2	neon <b>Ne</b> 10	argon <b>Ar</b> 18	<b>Noble gases</b> have a full outer electrons shell, which makes these elements non-reactive. <small>Buzzle.com</small>
krypton <b>Kr</b> 36	xenon <b>Xe</b> 54	radon <b>Rn</b> 86	

Radon (Rn), chemical element, a heavy radioactive gas of Group 18 (noble gases) of the periodic table, generated by the radioactive decay of radium.

**Q) Which one of the following is a chemical change?**

- A. Cutting of hair
- B. Graying of hair naturally
- C. Swelling of resin in water
- D. Cutting of fruit

**Q) Which one of the following is a chemical change?**

- A. Cutting of hair
- B. Graying of hair naturally**
- C. Swelling of resin in water
- D. Cutting of fruit

A chemical change (chemical reaction) is not reversible except by further chemical reactions. Hence, graying of hair is the correct answer as that cannot be reversed.

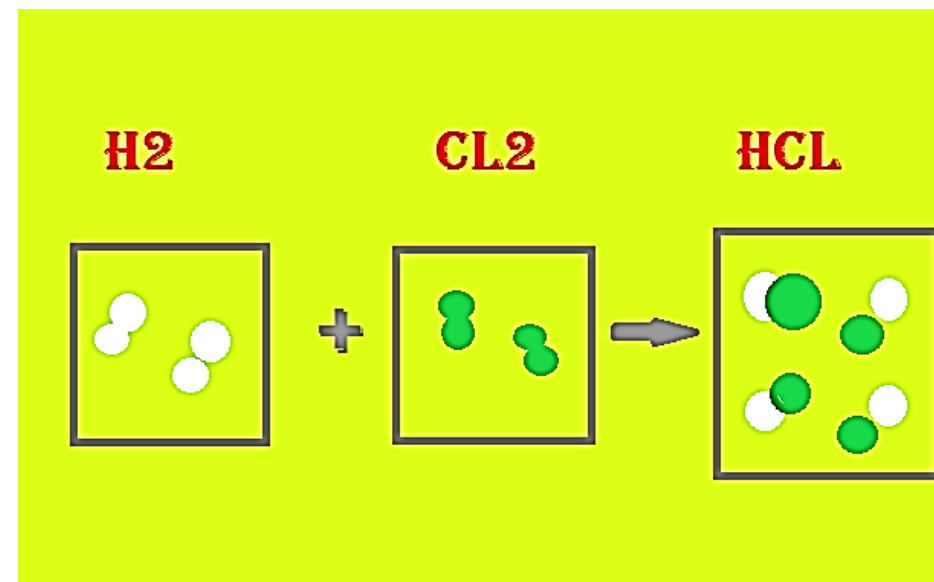
**Q) The proposition 'equal volumes of different gases contain equal numbers of molecules at the same temperature and pressure' is known as**

- A. Avogadro's hypothesis
- B. Gay-Lussac's hypothesis
- C. Planck's hypothesis
- D. Kirchhoff's theory



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- C. Planck's hypothesis
- D. Kirchhoff's theory



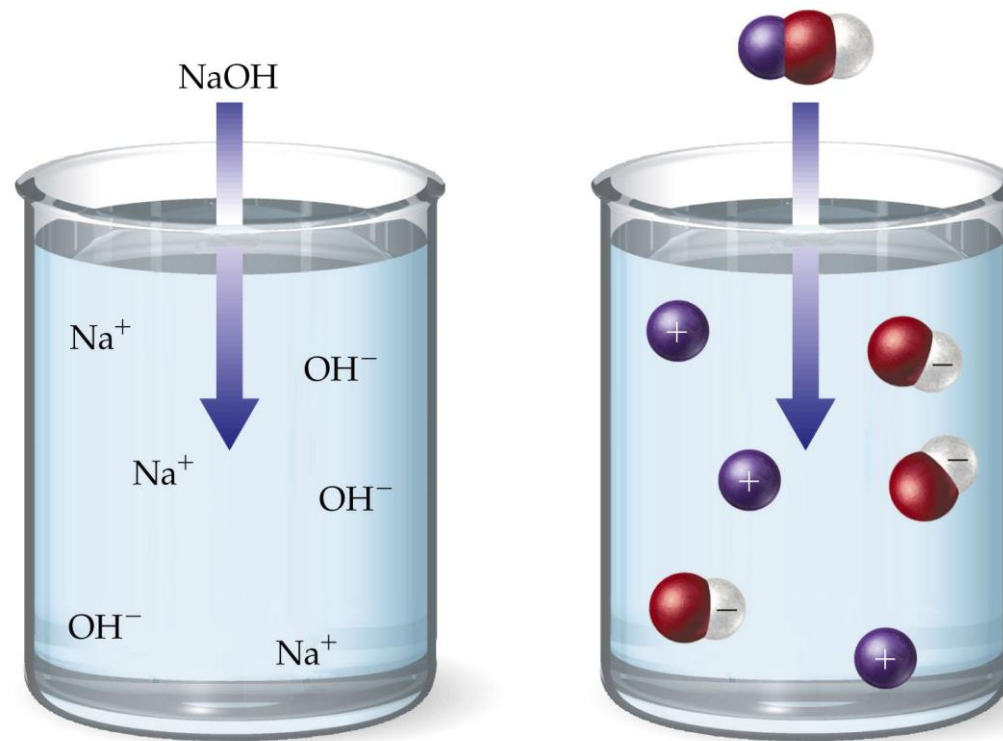
The law is named after Amedeo Avogadro who, in 1811, hypothesized that two given samples of an ideal gas, of the same volume and at the same temperature and pressure, contain the same number of molecules.

**Q) Which compound, when dissolved in water, conducts electricity and forms a basic solution?**

- A. HCl
- B.  $\text{CH}_3\text{COOH}$
- C.  $\text{CH}_3\text{OH}$
- D. NaOH

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- D. NaOH**



NaOH is a strong electrolyte. It is an alkali-a water soluble strong base.

**Q) Which one of the following is a cause of acid rains?**

- A. Ozone
- B. Ammonia
- C. Sulphur dioxide
- D. Carbon monoxide

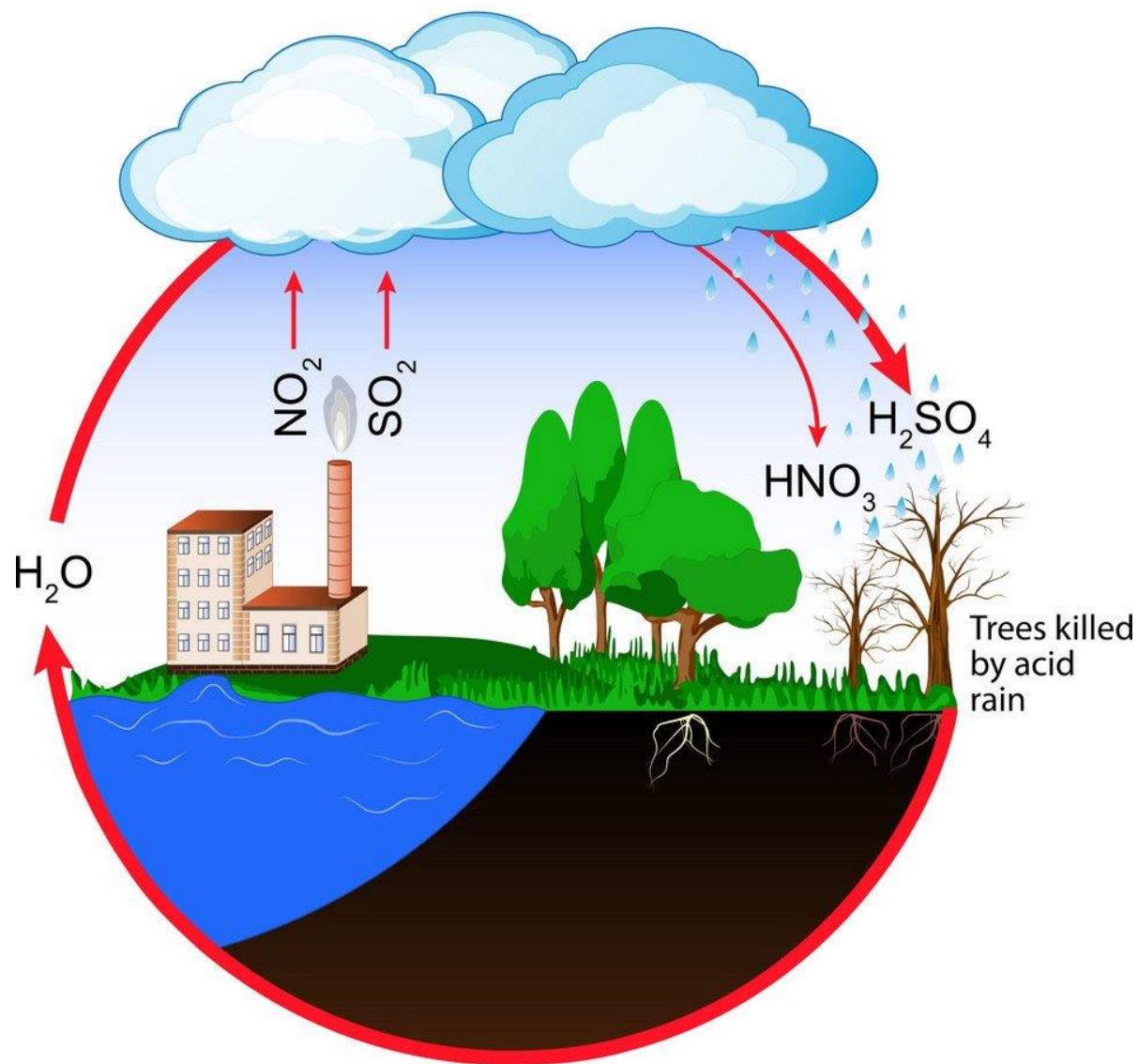
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- B. Ammonia
- C. Sulphur dioxide**
- D. Carbon monoxide



Acid rain is caused by a chemical reaction that begins when compounds like sulfur dioxide and nitrogen oxides are released into the air.

# ACID RAIN



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

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

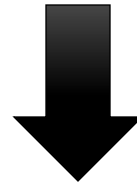
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# Nature provides neutralisation options

Nettle Plant  
(**Acidic**)



Dock Plant (**Basic**)



**Q) Brine is an aqueous solution of**

- A. NaCl
- B. NaOH
- C.  $\text{NaHCO}_3$
- D.  $\text{Na}_2\text{CO}_3$

Q) Brine is an aqueous solution of

A. NaCl

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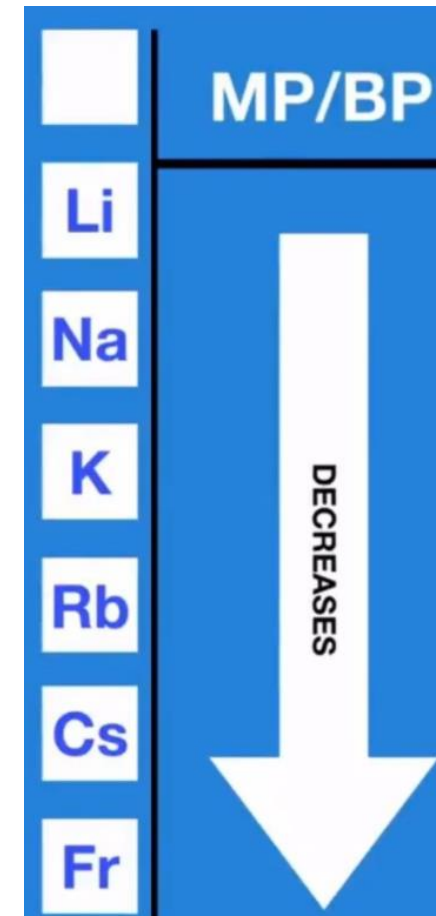
Brine, salt water, particularly a highly concentrated water solution of common salt (sodium chloride). Natural brines occur underground, in salt lakes, or as seawater

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

**Q) Which one of the following metals is alloyed with sodium to transfer heat in a nuclear reactor?**

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

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- A. Potassium**
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- C. Magnesium
- D. Strontium



Potassium is alloyed with sodium in order to transfer heat in nuclear reactor. Their combination is denoted as NaK

**Q) The absolute zero temperature is 0 Kelvin. In °C unit, which one of the following is the absolute zero temperature?**

A. 0°C

B. -100°C

C. -273.15°C

D. -173.15°C



**Q) The absolute zero temperature is 0 Kelvin. In °C unit, which one of the following is the absolute zero temperature?**

A. 0°C

B. -100°C

**C. -273.15°C**

D. -173.15°C

The absolute zero temperature is -273.15°C on Celsius temperature scale.

**Q) Which one of the following is called dry ice ?**

- A. Solid carbon dioxide
- B. Liquid carbon dioxide
- C. Liquid nitrogen
- D. Liquid ammonia

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D. Liquid ammonia



Solid Carbon Dioxide is called dry ice as it does not melt into a liquid when it is heated. Hence, the name is dry ice.

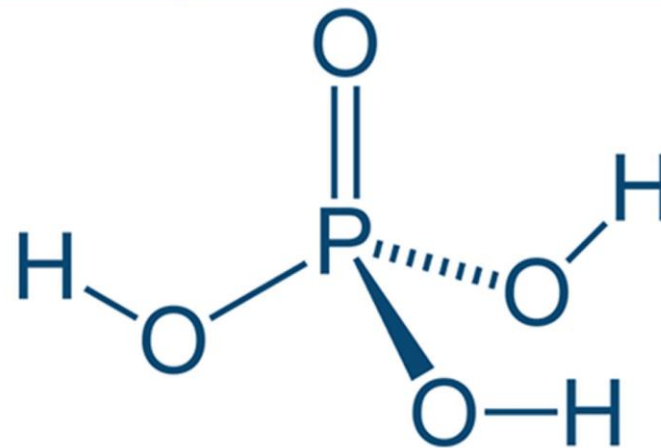
**Q) Which one of the following is a tribasic acid ?**

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

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- B. Nitric acid
- C. Sulphuric acid
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Phosphoric Acid Structure



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

**Q) Permanent hardness of water cannot be removed by which one of the following methods ?**

- A. Treatment with washing soda
- B. Calgon's method
- C. Boiling
- D. Ion exchange method

**Q) Permanent hardness of water cannot be removed by which one of the following methods ?**

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D. Ion exchange method

Permanent hardness of water is caused by the presence of the chlorides, nitrates and sulphates of calcium and magnesium. Boiling cannot precipitate these substances. It can be removed by treating it with soda water and using permutate process.

**Q) Which one of the following is the correct relation between A and nm ?**

A.  $1 \text{ nm} = 10^{-1} \text{ A}$

B.  $1 \text{ nm} = 10 \text{ A}$

C.  $1 \text{ nm} = 1 \text{ A}$

D.  $1 \text{ nm} = 10^{-2} \text{ A}$



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Angstrom to Nanometer conversion Table-

Angstrom (A)	Nanometer (nm)
0.01	0.001
0.1	0.01
1	0.1
2	0.2
10	1
100	10

**Q) Which one of the following is a heterogeneous mixture ?**

- A. Hydrochloric acid
- B. Vinegar
- C. Milk
- D. Soda water

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A. Hydrochloric acid

B. Vinegar

**C. Milk**

D. Soda water



Milk under microscope contains little globs of solid fat amongst the liquid particles. Those globs of fat are so small that they float in the liquid milk forming a suspension, never sinking to the bottom. That makes the milk a heterogeneous mixture.

**Q) A sample of oxygen contains two isotopes of oxygen with masses 16 u and 18 u respectively. The proportion of these isotopes in the sample is 3: 1. What will be the average atomic mass of oxygen in this sample ?**

- A. 17.5 u
- B. 17 u
- C. 16 u
- D. 16.5 u

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**D. 16.5 u**

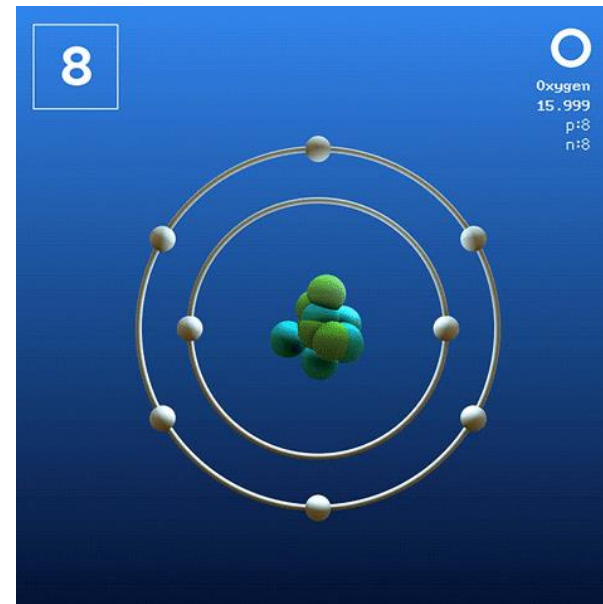
$$\begin{array}{ccc} \text{O}^{16} & & \text{O}^{18} \\ & 3 : 1 & \\ \frac{3}{4} \times 16 & + & \frac{1}{4} \times 18 \\ \Rightarrow 12 + 4.5 & \Rightarrow & \boxed{16.5} \end{array}$$

**Q) The atomic number of an element is 8. How many electrons will it gain to form a compound with sodium ?**

- A. One
- B. Two
- C. Three
- D. Four

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It has 6 electrons in its outermost orbit, and it lacks two electrons to obtain octane configuration. Hence, to form a sodium compound that is  $\text{Na}_2\text{O}$ , each sodium atom releases one electron and those are caught by 1 O atom, thus forming  $\text{Na}_2\text{O}$ .

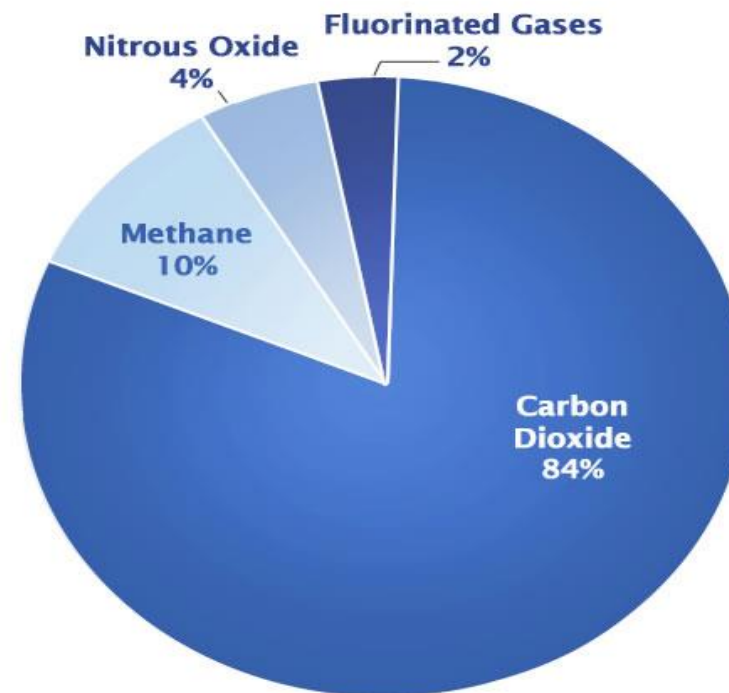
**Q) Which one of the following greenhouse gases is in largest concentration in the atmosphere ?**

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



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

**Q) The solution of which one of the following will have pH less than 7 ?**

A. NaOH

B. KCl

C.  $\text{FeCl}_3$

D. NaCl

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C.  $\text{FeCl}_3$

D. NaCl



$\text{FeCl}_3$  is an acidic salt and pH value is less than 3.

**Q) Which one of the following minerals is used as a fuel in nuclear power stations?**

- A. Bauxite
- B. Quartz
- C. Feldspar
- D. Pitchblende

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Pitchblende is a radioactive, uranium-rich mineral and ore it has chemical composition, which is largely  $\text{UO}_2$ , but also contains  $\text{UO}_3$  and oxides of lead, thorium and Rare earth elements.

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

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

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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.  $\text{Mg}^{2+}$ , Ar

B.  $\text{Na}^+$ ,  $\text{O}^{2-}$

C.  $\text{Al}^{3+}$ ,  $\text{Cl}^-$

D.  $\text{K}^+$ , Ne



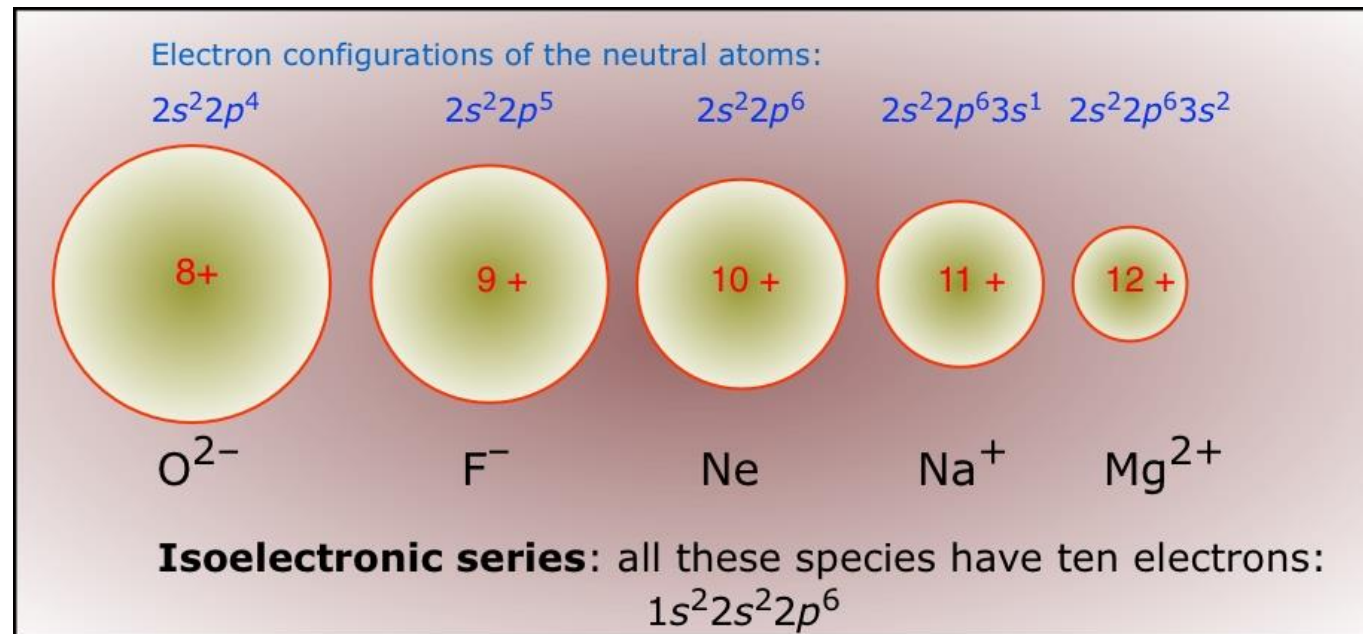
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D.  $\text{K}^+$ , Ne



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

**Q) Basic scientific principle behind a nuclear reactor is**

- A. Nuclear fusion
- B. Controlled nuclear fusion
- C. Uncontrolled nuclear fission
- D. Controlled nuclear fission

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In Nuclear Fission, radioactive materials are bombarded with neutrons which split nucleus into smaller nuclei.

**Q) Which one of the following statements is NOT correct for the given reaction?**



- A. Iron is the reducing agent
- B. The solution turns green in colour after the reaction
- C. Copper is a more reactive metal than iron
- D. The reaction is an example of a redox reaction

Q) Which one of the following statements is NOT correct for the given reaction?



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Potassium	K
Sodium	Na
Calcium	Ca
Magnesium	Mg
Aluminium	Al
Zinc	Zn
Iron	Fe
Nickel	Ni
Tin	Sn
Lead	Pb
Hydrogen	H
Copper	Cu
Mercury	Hg
Silver	Ag
Gold	Au
Platinum	Pt

ACTIVITY SERIES



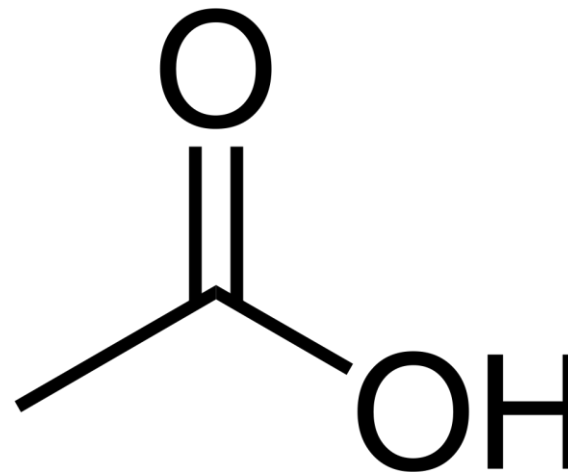
Copper is less reactive than Iron as in the given reaction, Copper is reduced by Iron.

**Q) Which one of the following is an organic acid ?**

- A. Hydrochloric acid
- B. Nitric acid
- C. Acetic acid
- D. Sulphuric acid

**Q) Which one of the following is an organic acid ?**

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



Organic acids are the organic compounds formed by Carbon and hydrogen atoms. Acetic acid is a common organic acid having formula  $\text{CH}_3\text{COOH}$ .

**Q) Dinitrogen ( $\text{N}_2$ ) and dioxygen ( $\text{O}_2$ ) are the main constituents of air but they do not react with each other to form oxides of nitrogen because**

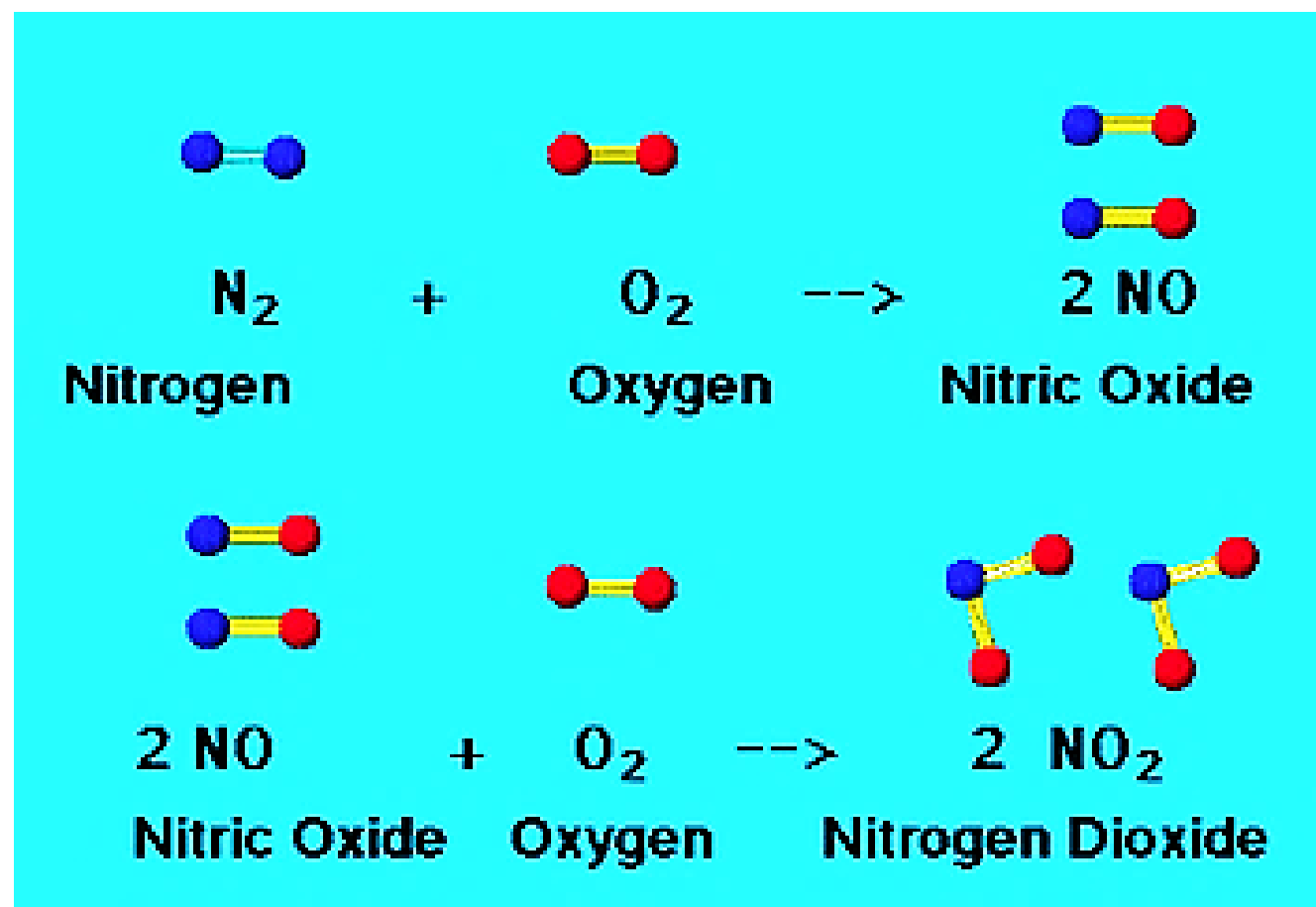
- A. The reaction requires initiation by a catalyst
- B. Oxides of nitrogen are unstable
- C. The reaction is endothermic and requires very high temperature
- D. The stoichiometry of  $\text{N}_2$  and  $\text{O}_2$  in air is not ideal for the reaction to take place



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$\text{N}_2$  and  $\text{O}_2$  are unreactive to each other. The very high temperature of lightning bolt causes nitrogen and oxygen in air to react with each other to form Nitric Oxide which further reacts with oxygen to form Nitrogen Dioxide.



**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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C. Copper sulphate

D. Copper Nitrate



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 will NOT produce carbon dioxide on reacting with an aqueous solution of hydrochloric acid ?**

- A. Limestone
- B. Quick lime
- C. Chalk
- D. Marble

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- B. Quick lime**
- C. Chalk
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Quick lime is the base that reacts with a solution of hydrochloric acid and form salt or water.

**Q) Which one of the following substances is NOT a mixture ?**

- A. Ice
- B. Ice-cream
- C. Air
- D. Honey

**Q) Which one of the following substances is NOT a mixture ?**

**A. Ice**

B. Ice-cream

C. Air

D. Honey



Honey is a homogeneous mixture of various types of sugar compounds



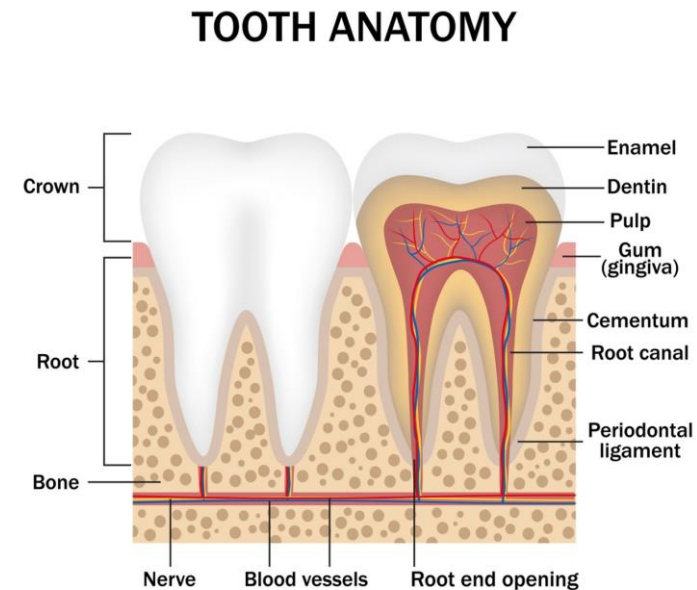
**Q) Tooth enamel is made up of which one of the following calcium compounds ?**

- A. Calcium carbonate
- B. Calcium sulphate
- C. Calcium hydroxide
- D. Calcium phosphate

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Tooth Enamel is made up of Calcium phosphate



**Q) The formula for conversion between Fahrenheit and Celsius is**

$$^{\circ}\text{F} = X + (1.8 \times ^{\circ}\text{C})$$

**What is factor X?**

- A. 32
- B. 22
- C. 98
- D. 42

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**A. 32**

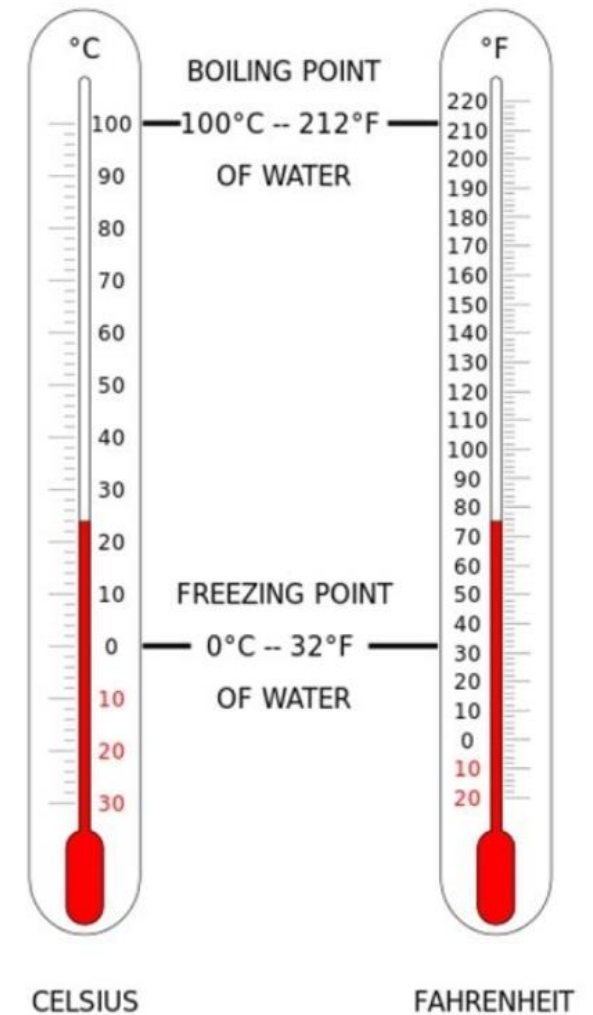
B. 22

C. 98

D. 42

$$^{\circ}\text{F} = 32 + (1.8 \times ^{\circ}\text{C})$$

There is one point on the Fahrenheit and Celsius scales where the temperatures in degrees are equal:  $-40^{\circ}$ .



**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,  
 $= 45 + 273.15 \text{ K}$   
 $= 318.15 \text{ K}$

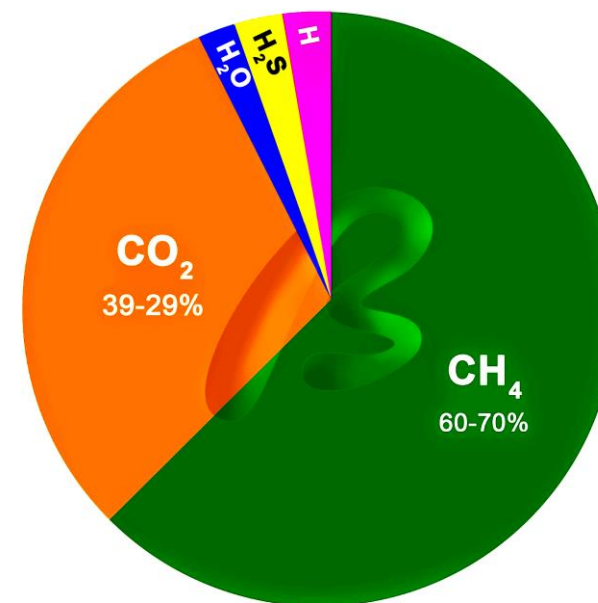
**Q) Which one of the following is the major constituent of biogas?**

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



**Q) Which one of the following is the major constituent of biogas?**

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



Pie chart of Raw Biogas

Biogas is a methane-rich fuel gas.

**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.  $\text{Cu} > \text{Ag} > \text{Zn}$

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C.  $\text{Cu} > \text{Zn} > \text{Ag}$

D.  $\text{Cu} > \text{Ag} > \text{Zn}$

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

# Periodic Table of the Elements

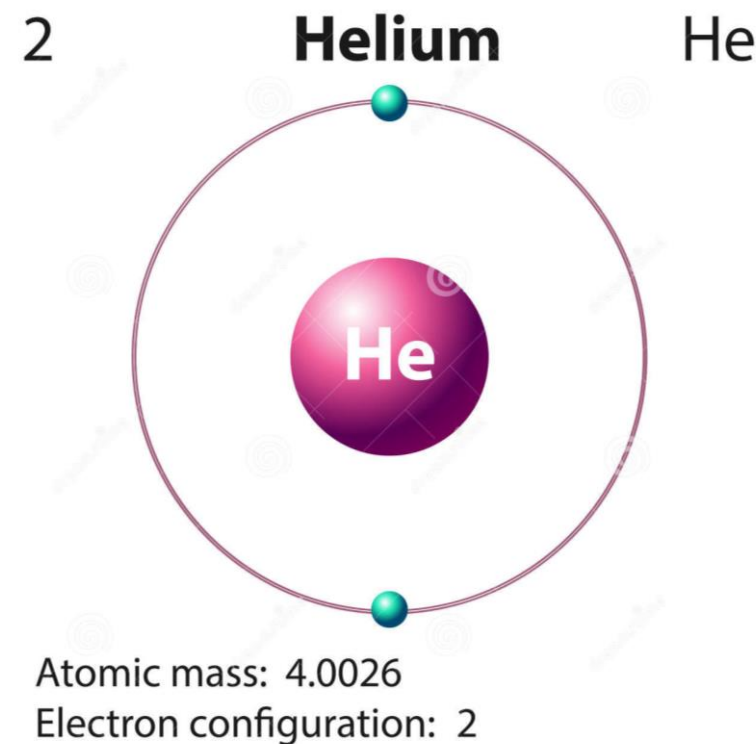
<div><div>Atomic Number →</div><div>← Symbol</div><div>Name →</div><div>← Atomic Weight</div><div>Electrons per shell →</div></div>																		<div><div>State of matter (color of name)</div><div>GAS LIQUID SOLID UNKNOWN</div><div>Subcategory in the metal-metalloid-nonmetal trend (color of background)</div><div>Alkali metals Alkaline earth metals Transition metals Lanthanides Actinides Post-transition metals Metalloids Reactive nonmetals Noble gases Unknown chemical properties</div></div>																																																																																																																																																																																																																																																																																																																	
<div><div>1</div><div>IA</div><div>1</div><div>H</div><div>Hydrogen</div><div>1.008</div><div>1</div></div>																		<div><div>2</div><div>IIA</div><div>4</div><div>Be</div><div>Beryllium</div><div>9.0122</div><div>2-2</div></div>																		<div><div>13</div><div>IIIA</div><div>5</div><div>B</div><div>Boron</div><div>10.81</div><div>2-3</div></div>																		<div><div>14</div><div>IVA</div><div>6</div><div>C</div><div>Carbon</div><div>12.011</div><div>2-4</div></div>																		<div><div>15</div><div>VA</div><div>7</div><div>N</div><div>Nitrogen</div><div>14.007</div><div>2-5</div></div>																		<div><div>16</div><div>VIA</div><div>8</div><div>O</div><div>Oxygen</div><div>15.999</div><div>2-6</div></div>																		<div><div>17</div><div>VIIA</div><div>9</div><div>F</div><div>Fluorine</div><div>18.998</div><div>2-7</div></div>																		<div><div>18</div><div>VIIIA</div><div>10</div><div>Ne</div><div>Neon</div><div>20.180</div><div>2-8</div></div>																																																																																																																																																																																																					
<div><div>11</div><div>IA</div><div>11</div><div>Na</div><div>Sodium</div><div>22.98976928</div><div>2-1</div></div>																		<div><div>12</div><div>IIA</div><div>12</div><div>Mg</div><div>Magnesium</div><div>24.305</div><div>2-2</div></div>																		<div><div>13</div><div>IIIA</div><div>13</div><div>Al</div><div>Aluminium</div><div>26.982</div><div>2-3</div></div>																		<div><div>14</div><div>IVA</div><div>14</div><div>Si</div><div>Silicon</div><div>28.085</div><div>2-4</div></div>																		<div><div>15</div><div>VA</div><div>15</div><div>P</div><div>Phosphorus</div><div>30.974</div><div>2-5</div></div>																		<div><div>16</div><div>VIA</div><div>16</div><div>S</div><div>Sulfur</div><div>32.06</div><div>2-6</div></div>																		<div><div>17</div><div>VIIA</div><div>17</div><div>Cl</div><div>Chlorine</div><div>35.45</div><div>2-7</div></div>																		<div><div>18</div><div>VIIIA</div><div>18</div><div>Ar</div><div>Argon</div><div>39.948</div><div>2-8</div></div>																																																																																																																																																																																																					
<div><div>19</div><div>IA</div><div>19</div><div>K</div><div>Potassium</div><div>39.0983</div><div>2-8-1</div></div>																		<div><div>20</div><div>IIA</div><div>20</div><div>Ca</div><div>Calcium</div><div>40.078</div><div>2-8-2</div></div>																		<div><div>21</div><div>IIIB</div><div>21</div><div>Sc</div><div>Scandium</div><div>44.955908</div><div>2-8-2</div></div>																		<div><div>22</div><div>IVB</div><div>22</div><div>Ti</div><div>Titanium</div><div>47.867</div><div>2-8-10-2</div></div>																		<div><div>23</div><div>VB</div><div>23</div><div>V</div><div>Vanadium</div><div>50.9415</div><div>2-8-11-2</div></div>																		<div><div>24</div><div>VIB</div><div>24</div><div>Cr</div><div>Chromium</div><div>51.9961</div><div>2-8-13-1</div></div>																		<div><div>25</div><div>VIIB</div><div>25</div><div>Mn</div><div>Manganese</div><div>54.938044</div><div>2-8-13-2</div></div>																		<div><div>26</div><div>VIIIB</div><div>26</div><div>Fe</div><div>Iron</div><div>55.845</div><div>2-8-14-2</div></div>																		<div><div>27</div><div>VIIIB</div><div>27</div><div>Co</div><div>Cobalt</div><div>58.933</div><div>2-8-15-2</div></div>																		<div><div>28</div><div>VIIIB</div><div>28</div><div>Ni</div><div>Nickel</div><div>58.693</div><div>2-8-16-2</div></div>																		<div><div>29</div><div>IB</div><div>29</div><div>Cu</div><div>Copper</div><div>63.546</div><div>2-8-18-1</div></div>																		<div><div>30</div><div>IIB</div><div>30</div><div>Zn</div><div>Zinc</div><div>65.38</div><div>2-8-18-2</div></div>																		<div><div>31</div><div>IIIB</div><div>31</div><div>Ga</div><div>Gallium</div><div>69.723</div><div>2-8-18-3</div></div>																		<div><div>32</div><div>IVB</div><div>32</div><div>Ge</div><div>Germanium</div><div>72.630</div><div>2-8-18-4</div></div>																		<div><div>33</div><div>VB</div><div>33</div><div>As</div><div>Arsenic</div><div>74.922</div><div>2-8-18-5</div></div>																		<div><div>34</div><div>VIB</div><div>34</div><div>Se</div><div>Selenium</div><div>78.971</div><div>2-8-18-6</div></div>																		<div><div>35</div><div>VIIA</div><div>35</div><div>Br</div><div>Bromine</div><div>79.904</div><div>2-8-18-7</div></div>																		<div><div>36</div><div>VIIIA</div><div>36</div><div>Kr</div><div>Krypton</div><div>83.798</div><div>2-8-18-8</div></div>																	
<div><div>37</div><div>IA</div><div>37</div><div>Rb</div><div>Rubidium</div><div>85.4678</div><div>2-8-18-1</div></div>																		<div><div>38</div><div>IIA</div><div>38</div><div>Sr</div><div>Strontium</div><div>87.62</div><div>2-8-18-2</div></div>																		<div><div>39</div><div>IIIB</div><div>39</div><div>Y</div><div>Yttrium</div><div>88.90584</div><div>2-8-18-2</div></div>																		<div><div>40</div><div>IVB</div><div>40</div><div>Zr</div><div>Zirconium</div><div>91.224</div><div>2-8-18-10-2</div></div>																		<div><div>41</div><div>VIB</div><div>41</div><div>Nb</div><div>Niobium</div><div>92.90637</div><div>2-8-18-10-1</div></div>																		<div><div>42</div><div>VIIIB</div><div>42</div><div>Mo</div><div>Molybdenum</div><div>95.95</div><div>2-8-18-13-1</div></div>																		<div><div>43</div><div>VIIIB</div><div>43</div><div>Tc</div><div>Technetium</div><div>(98)</div><div>2-8-18-13-2</div></div>																		<div><div>44</div><div>VIIIB</div><div>44</div><div>Ru</div><div>Ruthenium</div><div>101.07</div><div>2-8-18-16-1</div></div>																		<div><div>45</div><div>VIIIB</div><div>45</div><div>Rh</div><div>Rhodium</div><div>102.91</div><div>2-8-18-16-2</div></div>																		<div><div>46</div><div>VIIIB</div><div>46</div><div>Pd</div><div>Palladium</div><div>106.42</div><div>2-8-18-18</div></div>																		<div><div>47</div><div>IB</div><div>47</div><div>Ag</div><div>Silver</div><div>107.87</div><div>2-8-18-18-1</div></div>																		<div><div>48</div><div>IIB</div><div>48</div><div>Cd</div><div>Cadmium</div><div>112.41</div><div>2-8-18-18-2</div></div>																		<div><div>49</div><div>IIIB</div><div>49</div><div>In</div><div>Indium</div><div>114.82</div><div>2-8-18-18-3</div></div>																		<div><div>50</div><div>IVB</div><div>50</div><div>Sn</div><div>Tin</div><div>118.71</div><div>2-8-18-18-4</div></div>																		<div><div>51</div><div>VIB</div><div>51</div><div>Sb</div><div>Antimony</div><div>121.76</div><div>2-8-18-18-5</div></div>																		<div><div>52</div><div>VIIA</div><div>52</div><div>Te</div><div>Tellurium</div><div>127.60</div><div>2-8-18-18-6</div></div>																		<div><div>53</div><div>VIIIA</div><div>53</div><div>I</div><div>Iodine</div><div>126.90</div><div>2-8-18-18-7</div></div>																		<div><div>54</div><div>VIIIA</div><div>54</div><div>Xe</div><div>Xenon</div><div>131.29</div><div>2-8-18-18-8</div></div>																	
<div><div>55</div><div>IA</div><div>55</div><div>Cs</div><div>Cesium</div><div>132.90545196</div><div>2-8-18-18-1</div></div>																		<div><div>56</div><div>IIA</div><div>56</div><div>Ba</div><div>Barium</div><div>137.327</div><div>2-8-18-18-2</div></div>																		<div><div>57-71</div><div>IIIB</div><div>57-71</div><div>Lanthanides</div></div>																		<div><div>72</div><div>IVB</div><div>72</div><div>Hf</div><div>Hafnium</div><div>178.49</div><div>2-8-18-32-10-2</div></div>																		<div><div>73</div><div>VIB</div><div>73</div><div>Ta</div><div>Tantalum</div><div>180.94788</div><div>2-8-18-32-11-2</div></div>																		<div><div>74</div><div>VIIIB</div><div>74</div><div>W</div><div>Tungsten</div><div>183.84</div><div>2-8-18-32-12-2</div></div>																		<div><div>75</div><div>VIIIB</div><div>75</div><div>Re</div><div>Rhenium</div><div>186.21</div><div>2-8-18-32-13-2</div></div>																		<div><div>76</div><div>VIIIB</div><div>76</div><div>Os</div><div>Osmium</div><div>190.23</div><div>2-8-18-32-14-2</div></div>																		<div><div>77</div><div>VIIIB</div><div>77</div><div>Ir</div><div>Iridium</div><div>192.22</div><div>2-8-18-32-15-2</div></div>																		<div><div>78</div><div>VIIIB</div><div>78</div><div>Pt</div><div>Platinum</div><div>195.08</div><div>2-8-18-32-17-1</div></div>																		<div><div>79</div><div>IB</div><div>79</div><div>Au</div><div>Gold</div><div>196.97</div><div>2-8-18-32-18-1</div></div>																		<div><div>80</div><div>IIB</div><div>80</div><div>Hg</div><div>Mercury</div><div>200.59</div><div>2-8-18-32-18-2</div></div>																		<div><div>81</div><div>IIIB</div><div>81</div><div>Tl</div><div>Thallium</div><div>204.38</div><div>2-8-18-32-18-3</div></div>																		<div><div>82</div><div>IVB</div><div>82</div><div>Pb</div><div>Lead</div><div>207.2</div><div>2-8-18-32-18-4</div></div>																		<div><div>83</div><div>VIB</div><div>83</div><div>Bi</div><div>Bismuth</div><div>208.98</div><div>2-8-18-32-18-5</div></div>																		<div><div>84</div><div>VIIA</div><div>84</div><div>Po</div><div>Polonium</div><div>(209)</div><div>2-8-18-32-18-6</div></div>																		<div><div>85</div><div>VIIIA</div><div>85</div><div>At</div><div>Astatine</div><div>(210)</div><div>2-8-18-32-18-7</div></div>																		<div><div>86</div><div>VIIIA</div><div>86</div><div>Rn</div><div>Radon</div><div>(222)</div><div>2-8-18-32-18-8</div></div>																	
<div><div>87</div><div>IA</div><div>87</div><div>Fr</div><div>Francium</div><div>(223)</div><div>2-8-18-32-18-8-1</div></div>																		<div><div>88</div><div>IIA</div><div>88</div><div>Ra</div><div>Radium</div><div>(226)</div><div>2-8-18-32-18-8-2</div></div>																		<div><div>89-103</div><div>IIIB</div><div>89-103</div><div>Actinides</div></div>																		<div><div>104</div><div>IVB</div><div>104</div><div>Rf</div><div>Rutherfordium</div><div>(261)</div><div>2-8-18-32-32-10-2</div></div>																		<div><div>105</div><div>VIB</div><div>105</div><div>Db</div><div>Dubnium</div><div>(268)</div><div>2-8-18-32-32-11-2</div></div>																		<div><div>106</div><div>VIIIB</div><div>106</div><div>Sg</div><div>Seaborgium</div><div>(269)</div><div>2-8-18-32-32-12-2</div></div>																		<div><div>107</div><div>VIIIB</div><div>107</div><div>Bh</div><div>Bohrium</div><div>(270)</div><div>2-8-18-32-32-13-2</div></div>																		<div><div>108</div><div>VIIIB</div><div>108</div><div>Hs</div><div>Hassium</div><div>(277)</div><div>2-8-18-32-32-14-2</div></div>																		<div><div>109</div><div>VIIIB</div><div>109</div><div>Mt</div><div>Meitnerium</div><div>(278)</div><div>2-8-18-32-32-15-2</div></div>																		<div><div>110</div><div>VIIIB</div><div>110</div><div>Ds</div><div>Darmstadtium</div><div>(281)</div><div>2-8-18-32-32-17-1</div></div>																		<div><div>111</div><div>IB</div><div>111</div><div>Rg</div><div>Roentgenium</div><div>(282)</div><div>2-8-18-32-32-17-2</div></div>																		<div><div>112</div><div>IIB</div><div>112</div><div>Cn</div><div>Copernicium</div><div>(285)</div><div>2-8-18-32-32-18-2</div></div>																		<div><div>113</div><div>IIIB</div><div>113</div><div>Nh</div><div>Nihonium</div><div>(286)</div><div>2-8-18-32-32-18-3</div></div>																		<div><div>114</div><div>IVB</div><div>114</div><div>Fl</div><div>Flerovium</div><div>(289)</div><div>2-8-18-32-32-18-4</div></div>																		<div><div>115</div><div>VIB</div><div>115</div><div>Mc</div><div>Moscovium</div><div>(290)</div><div>2-8-18-32-32-18-5</div></div>																		<div><div>116</div><div>VIIA</div><div>116</div><div>Lv</div><div>Livermorium</div><div>(293)</div><div>2-8-18-32-32-18-6</div></div>																		<div><div>117</div><div>VIIIA</div><div>117</div><div>Ts</div><div>Tennessine</div><div>(294)</div><div>2-8-18-32-32-18-7</div></div>																		<div><div>118</div><div>VIIIA</div><div>118</div><div>Og</div><div>Oganesson</div><div>(294)</div><div>2-8-18-32-32-18-8</div></div>																	
<div><div>57</div><div>IIIB</div><div>57</div><div>La</div><div>Lanthanum</div><div>138.91</div><div>2-8-18-18-9-2</div></div>																		<div><div>58</div><div>IVB</div><div>58</div><div>Ce</div><div>Cerium</div><div>140.12</div><div>2-8-18-18-9-2</div></div>																		<div><div>59</div><div>VB</div><div>59</div><div>Pr</div><div>Praseodymium</div><div>140.91</div><div>2-8-18-21-8-2</div></div>																		<div><div>60</div><div>VIB</div><div>60</div><div>Nd</div><div>Neodymium</div><div>144.24</div><div>2-8-18-22-8-2</div></div>																		<div><div>61</div><div>VIIIB</div><div>61</div><div>Pm</div><div>Promethium</div><div>(145)</div><div>2-8-18-22-8-2</div></div>																		<div><div>62</div><div>VIIIB</div><div>62</div><div>Sm</div><div>Samarium</div><div>150.36</div><div>2-8-18-24-8-2</div></div>																		<div><div>63</div><div>VIIIB</div><div>63</div><div>Eu</div><div>Europium</div><div>151.96</div><div>2-8-18-25-8-2</div></div>																		<div><div>64</div><div>VIIIB</div><div>64</div><div>Gd</div><div>Gadolinium</div><div>157.25</div><div>2-8-18-25-9-2</div></div>																		<div><div>65</div><div>VIIIB</div><div>65</div><div>Tb</div><div>Terbium</div><div>158.93</div><div>2-8-18-27-8-2</div></div>																		<div><div>66</div><div>VIIIB</div><div>66</div><div>Dy</div><div>Dysprosium</div><div>162.50</div><div>2-8-18-28-8-2</div></div>																		<div><div>67</div><div>VIIIB</div><div>67</div><div>Ho</div><div>Holmium</div><div>164.93</div><div>2-8-18-29-8-2</div></div>																		<div><div>68</div><div>VIIIB</div><div>68</div><div>Er</div><div>Erbium</div><div>167.26</div><div>2-8-18-30-8-2</div></div>																		<div><div>69</div><div>VIIIB</div><div>69</div><div>Tm</div><div>Thulium</div><div>168.93</div><div>2-8-18-31-8-2</div></div>																		<div><div>70</div><div>VIIIB</div><div>70</div><div>Yb</div><div>Ytterbium</div><div>173.05</div><div>2-8-18-32-8-2</div></div>																		<div><div>71</div><div>VIIIB</div><div>71</div><div>Lu</div><div>Lutetium</div><div>174.97</div><div>2-8-18-32-9-2</div></div>																																																																							
<div><div>89</div><div>IIIB</div><div>89</div><div>Ac</div><div>Actinium</div><div>(227)</div><div>2-8-18-32-18-9-2</div></div>																		<div><div>90</div><div>IVB</div><div>90</div><div>Th</div><div>Thorium</div><div>232.04</div><div>2-8-18-32-18-10-2</div></div>																		<div><div>91</div><div>VIB</div><div>91</div><div>Pa</div><div>Protactinium</div><div>231.04</div><div>2-8-18-32-20-9-2</div></div>																		<div><div>92</div><div>VIIIB</div><div>92</div><div>U</div><div>Uranium</div><div>238.03</div><div>2-8-18-32-21-9-2</div></div>																		<div><div>93</div><div>VIIIB</div><div>93</div><div>Np</div><div>Neptunium</div><div>(237)</div><div>2-8-18-32-22-9-2</div></div>																		<div><div>94</div><div>VIIIB</div><div>94</div><div>Pu</div><div>Plutonium</div><div>(244)</div><div>2-8-18-32-24-8-2</div></div>																		<div><div>95</div><div>VIIIB</div><div>95</div><div>Am</div><div>Americium</div><div>(243)</div><div>2-8-18-32-25-8-2</div></div>																		<div><div>96</div><div>VIIIB</div><div>96</div><div>Cm</div><div>Curium</div><div>(247)</div><div>2-8-18-32-25-9-2</div></div>																		<div><div>97</div><div>VIIIB</div><div>97</div><div>Bk</div><div>Berkelium</div><div>(247)</div><div>2-8-18-32-27-8-2</div></div>																		<div><div>98</div><div>VIIIB</div><div>98</div><div>Cf</div><div>Californium</div><div>(251)</div><div>2-8-18-32-28-8-2</div></div>																		<div><div>99</div><div>VIIIB</div><div>99</div><div>Es</div><div>Einsteinium</div><div>(252)</div><div>2-8-18-32-29-8-2</div></div>																		<div><div>100</div><div>VIIIB</div><div>100</div><div>Fm</div><div>Fermium</div><div>(257)</div><div>2-8-18-32-30-8-2</div></div>																		<div><div>101</div><div>VIIIB</div><div>101</div><div>Md</div><div>Mendelevium</div><div>(258)</div><div>2-8-18-32-31-8-2</div></div>																		<div><div>102</div><div>VIIIB</div><div>102</div><div>No</div><div>Nobelium</div><div>(259)</div><div>2-8-18-32-32-8-2</div></div>																		<div><div>103</div><div>VIIIB</div><div>103</div><div>Lr</div><div>Lawrencium</div><div>(260)</div><div>2-8-18-32-32-8-3</div></div>																																																																							

**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
- D. Barium



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

**Q) The net movement of water from a dilute to a concentrated solution through a selectively permeable membrane is called**

- A. Diffusion
- B. Dispersion
- C. Osmosis
- D. Absorption.

**Q) The net movement of water from a dilute to a concentrated solution through a selectively permeable membrane is called**

- A. Diffusion
- B. Dispersion
- C. Osmosis**
- D. Absorption.

Osmosis is defined as the movement of a solvent across a semipermeable membrane. Osmosis takes place towards a higher concentration of solute and the lower concentration of solvent.



**Q) Which one of the following substances is not a mixture?**

- A. Tin
- B. Seawater
- C. Soil
- D. Air

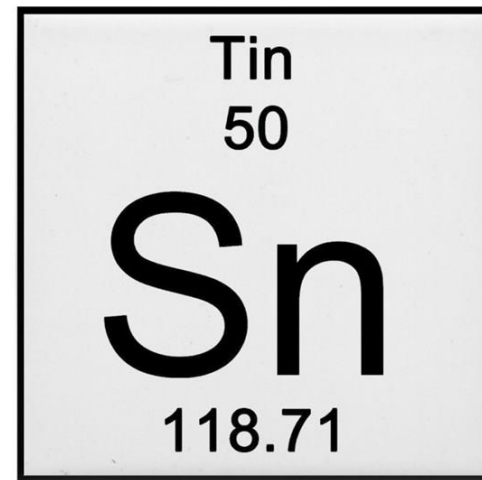
**Q) Which one of the following substances is not a mixture?**

**A. Tin**

B. Seawater

C. Soil

D. Air



Tin represented as Sn in the periodic table.

**Q) Which one of the following does not represent the salt, Calcium carbonate?**

- A. Lime water
- B. Limestone
- C. Chalk
- D. Marble

**Q) Which one of the following does not represent the salt, Calcium carbonate?**

**A. Lime water**

B. Limestone

C. Chalk

D. Marble

Lime water does not represent the salt calcium carbonate. Lime water is a Calcium hydroxide traditionally known as slaked lime.

**Q) Which one of the following statements about water is not true?**

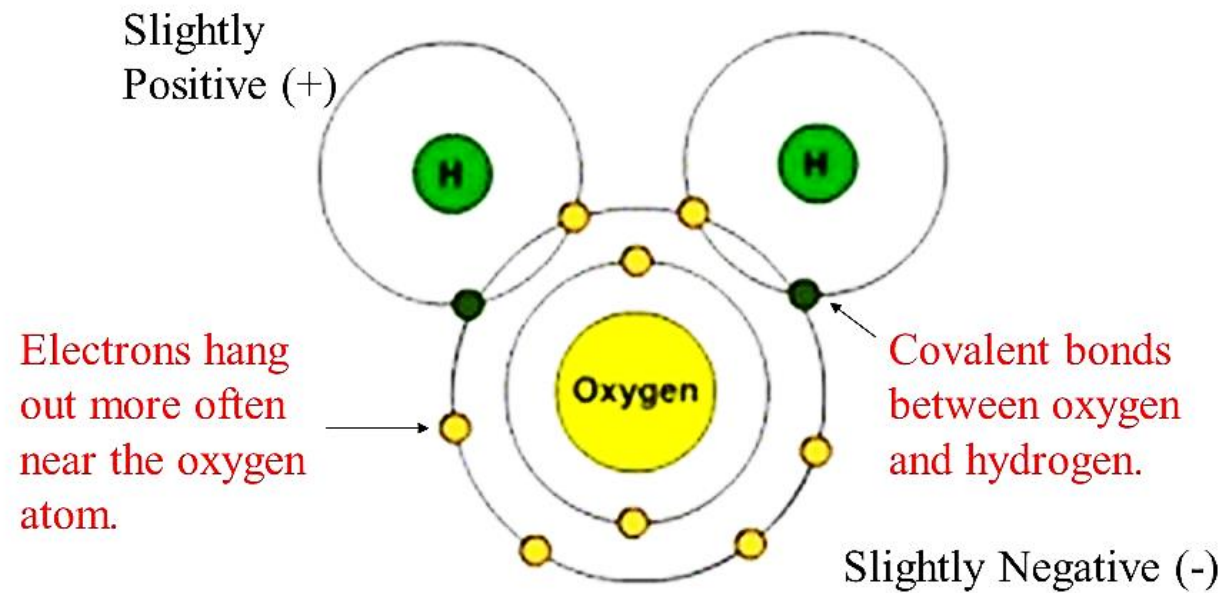
- A. Hydrogen bonds are present in liquid water.
- B. Water has a high boiling point.
- C. Water has a high heat of fusion.
- D. Water is a non-polar molecule.

**Q) Which one of the following statements about water is not true?**

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- B. Water has a high boiling point.
- C. Water has a high heat of fusion.
- D. Water is a non-polar molecule.**

WATER is a polar molecule. Hydrogen bonds are present in liquid water here it can form up to four hydrogen bonds with neighboring molecules.

# The Water Molecule



Polarity – water is polar because of an uneven distribution of electrons between oxygen and hydrogen.

**Q) The raw materials used for the manufacture of Portland cement are**

- A. Lime, silica and Sulphur dioxide
- B. Lime, silica and carbon dioxide
- C. Lime, silica and alumina
- D. Lime, silica and boric acid



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- B. Lime, silica and carbon dioxide
- C. Lime, silica and alumina**
- D. Lime, silica and boric acid



Portland cement is manufactured by using lime(calcium oxide  $\text{CaO}$ ), silica(Silicon di oxide  $\text{SiO}_2$ ), and alumina(Aluminium oxide  $\text{Al}_2\text{O}_3$ ).

**Q) Which one of the following statements is correct?**

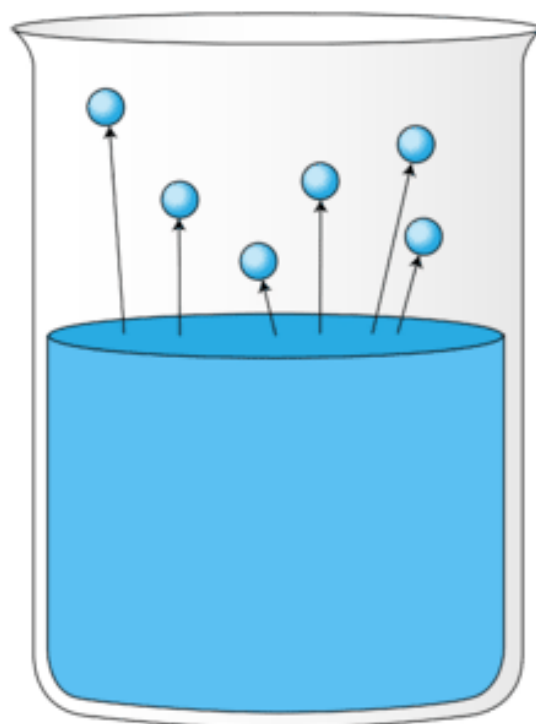
- A. Both boiling and evaporation are surface phenomena.
- B. Boiling is a surface phenomenon, but evaporation is a bulk phenomenon.
- C. Both boiling and evaporation are bulk phenomena.
- D. Boiling is a bulk phenomenon, but evaporation is a surface phenomenon.

**Q) Which one of the following statements is correct?**

- A. Both boiling and evaporation are surface phenomena.
- B. Boiling is a surface phenomenon, but evaporation is a bulk phenomenon.
- C. Both boiling and evaporation are bulk phenomena.
- D. Boiling is a bulk phenomenon, but evaporation is a surface phenomenon.**

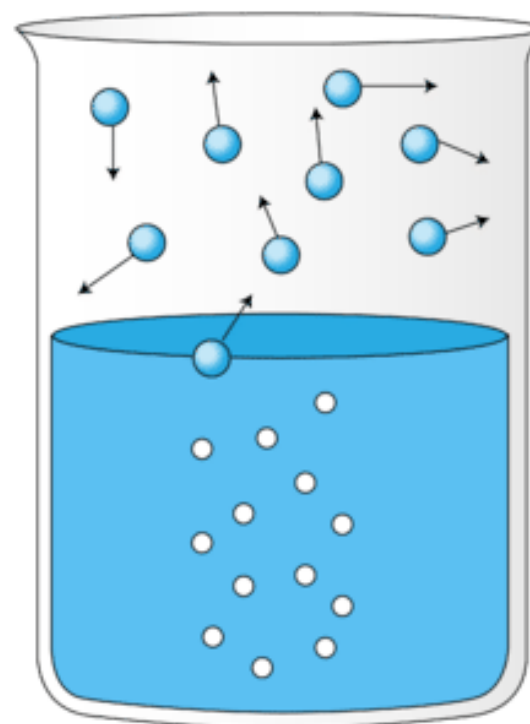
Evaporation is a surface phenomenon, as the surface area increases the rate of evaporation increases whereas boiling is considered as a bulk phenomenon.

## Evaporation



*Vapor Pressure < Atmospheric Pressure*  
Bubbles cannot form

## Boiling



*Vapor Pressure = Atmospheric Pressure*  
Bubbles can form and rise

**Q) Which one of the following compounds does not exhibit a different oxidation number of the same element?**



**Q) Which one of the following compounds does not exhibit a different oxidation number of the same element?**



In the oxidation state of  $\text{Fe}_2\text{O}_3$  two atoms of iron is 3 and Oxidation state of one atom of iron is 2. Here, the correct option is  $\text{Fe}_2\text{O}_3$  since the oxidation state is 3 for all atoms.

**Q) Which one of the following was the first mineral acid discovered?**

- A. Sulphuric Acid
- B. Hydrochloric Acid
- C. Nitric Acid
- D. Phosphoric Acid

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The discovery of sulfuric acid is credited to the 8th century alchemist Jabir ibn Hayyan.



**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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- B. Polystyrene
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Silica Gel has moisture adsorbing property

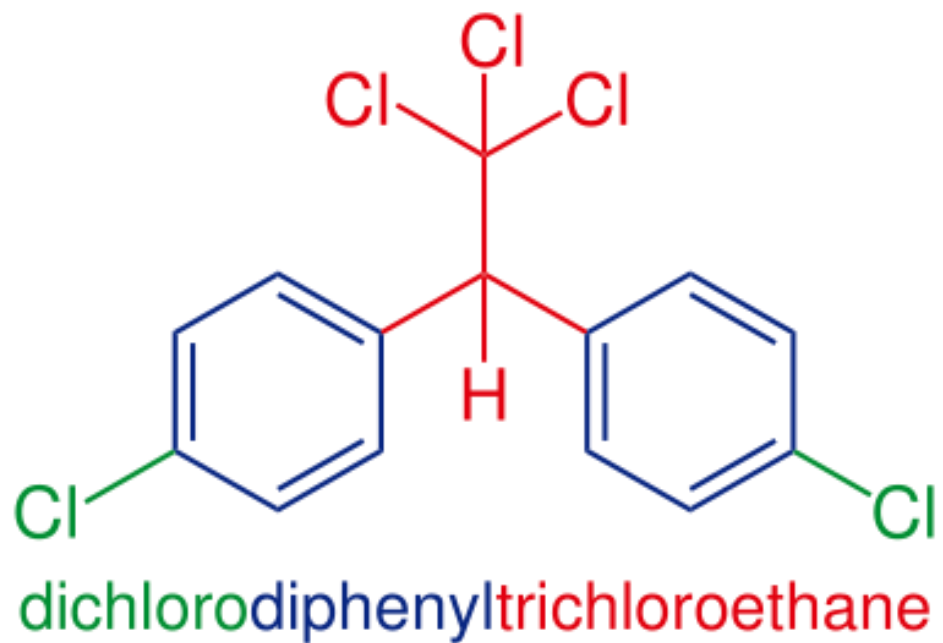
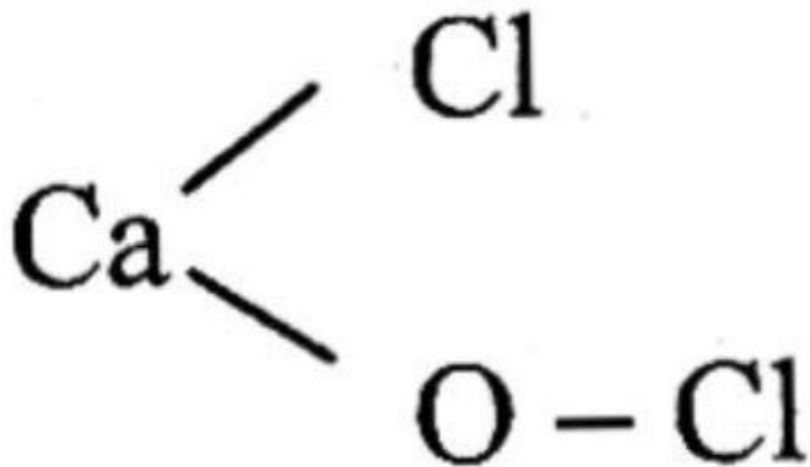
**Q) Which one of the following statements regarding Bleaching powder and D.D.T. is correct?**

- A. Both are inorganic compounds
- B. Both are organic compounds
- C. Both contain chlorine
- D. Both contain calcium

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Bleaching powder and D.D.T. both as Chlorine



**Q) Which one of the following is the correct sequence of change in colours when a turmeric stain on white clothes is scrubbed by soap and then washed with water?**

- A. Yellow - pink – blue
- B. Yellow - reddish brown- yellow
- C. Yellow- reddish brown blue
- D. Yellow - blue – pink

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- C. Yellow- reddish brown blue
- D. Yellow - blue – pink



Turmeric is a natural indicator, it turns reddish brown in basic solutions like soap. However it remains same in acidic solutions

**Q) Number of molecules of crystallization in copper sulphate, sodium carbonate and gypsum are**

- A. 5, 10 and 2 respectively
- B. 10, 2 and 5 respectively
- C. 5, 2 and 10 respectively
- D. 2, 5 and 10 respectively



Q) Number of molecules of crystallization in copper sulphate, sodium carbonate and gypsum are

- A. 5, 10 and 2 respectively  
B. 10, 2 and 5 respectively  
C. 5, 2 and 10 respectively  
D. 2, 5 and 10 respectively



Copper Sulphate:  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$

Sodium Carbonate:  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$

Gypsum:  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

**Q) At nearly 70°C, sodium bicarbonate shows the property of gradually decomposing, which makes it usable in bakery products. The product of decomposition responsible for this use of sodium bicarbonate is**

- A. Carbon Dioxide
- B. Hydrogen
- C. Water Vapour
- D. Oxygen

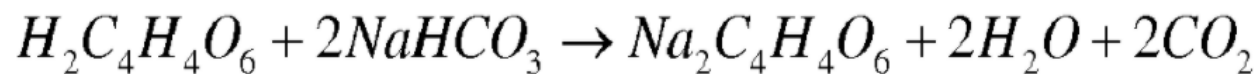
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Tartaric Acid

Sodium  
Bicarbonate

Sodium  
Tartarate

Water

Carbon  
Dioxide



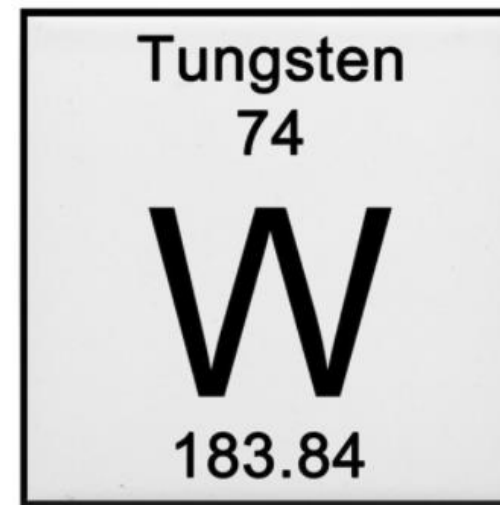
Carbon Dioxide is a gas and rises upwards and makes the bakery products soft and fluffy

**Q) In an incandescent electric bulb, the filament of the bulb is made up of which metal?**

- A. Aluminium
- B. Copper
- C. Tungsten
- D. Silver

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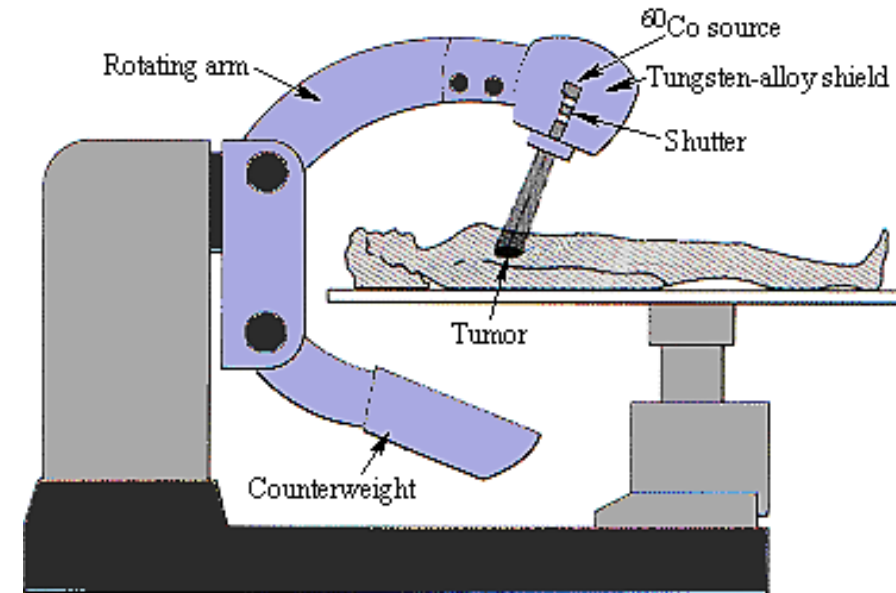
Being an alloy Tungsten has a very high melting point. It has very high resistivity so it does not burn easily at room temperature

**Q) Which one of the following element's isotope is used in the treatment of cancer?**

- A. Uranium
- B. Cobalt
- C. Sodium
- D. Iodine

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Cobalt -60 Isotope is used in the treatment of Cancer

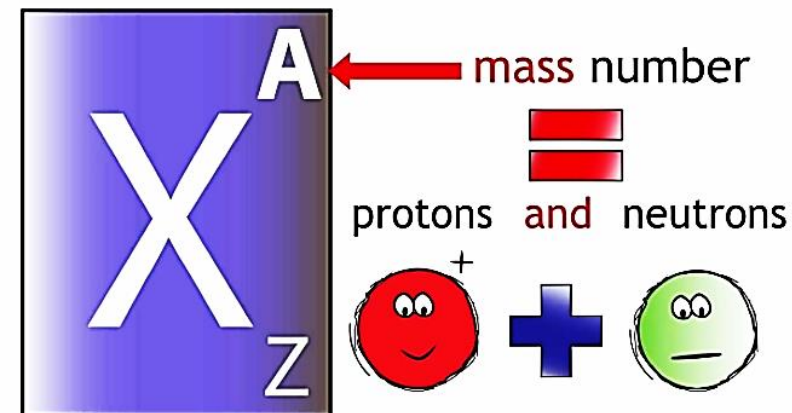
**Q) Atomic mass of an element is equal to the sum of number of**

- A. Electrons and protons only
- B. Protons and neutrons only
- C. Electrons and neutrons only
- D. Electrons, protons and neutrons



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- A. Electrons and protons only
- B. Protons and neutrons only**
- C. Electrons and neutrons only
- D. Electrons, protons and neutrons



Atomic Mass of an atom is the sum of total number of protons and neutrons

**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**
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- D. Atomic Weight

19	
K	
39.098	

ATOMIC WEIGHT

39.098

– ATOMIC NUMBER

19

number of neutrons

20.098

(rounded to nearest number = 20)

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

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**A. James Chadwick**

B. Ernest Rutherford

C. J J Thomson

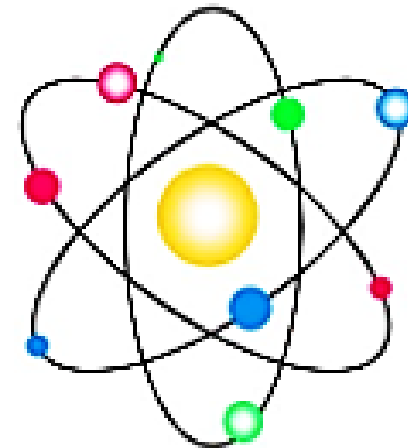
D. John Dalton



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

# Subatomic Particles

Particle	Symbol	Charge	Relative Mass
Electron	$e^-$	$1^-$	0
Proton	$p^+$	$1^+$	1
Neutron	$n$	0	1

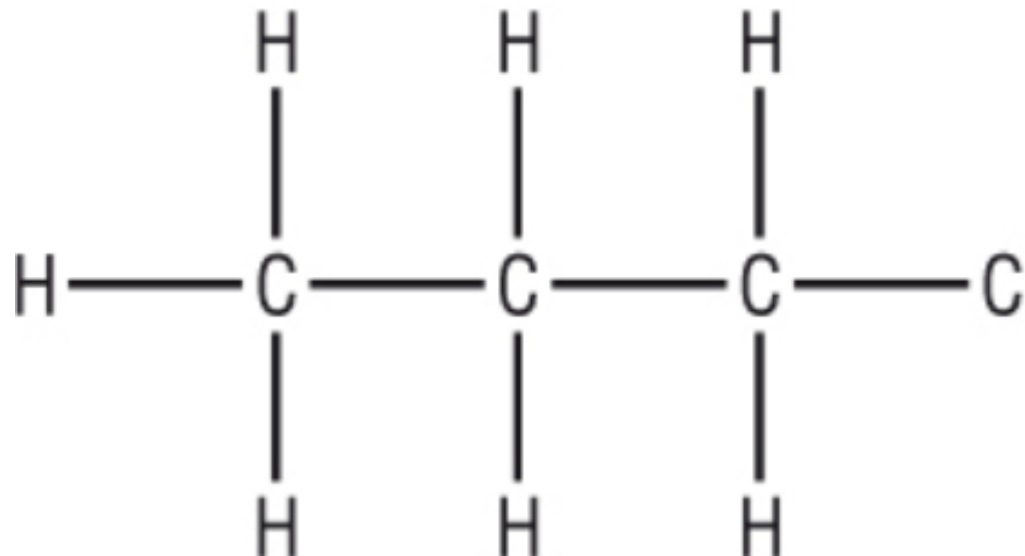


**Q) How many covalent bonds are present in a Chloropropane molecule having molecular formula,  $C_3H_7Cl$  ?**

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

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- C. 9
- D. 10**



10 Covalent Bonds are there in chloropropane



**Q) Vinegar is also known as**

- A. Ethanoic Acid
- B. Nitric Acid
- C. Sulphuric Acid
- D. Tartaric Acid

Q) Vinegar is also known as

A. Ethanoic Acid

B. Nitric Acid

C. Sulphuric Acid

D. Tartaric Acid



5-8% solution of acetic acid in water is called vinegar

**Q) The number of maximum electrons in N Shell is**

- A. 2
- B. 8
- C. 18
- D. 32

Q) The number of maximum electrons in N Shell is

- A. 2
- B. 8
- C. 18
- D. 32**

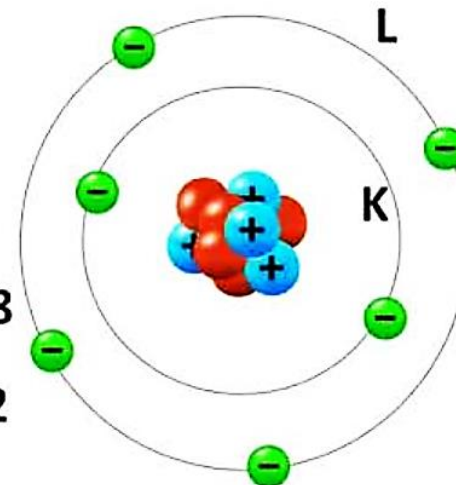
Maximum no. of electrons in each shell =  $2n^2$

$$K \rightarrow 2 \times 1^2 = 2$$

$$L \rightarrow 2 \times 2^2 = 8$$

$$M \rightarrow 2 \times 3^2 = 18$$

$$N \rightarrow 2 \times 4^2 = 32$$



N shell can have maximum 32 electrons

**Q) Chalk and marble are different forms of**

- A. Calcium Hydrogen Carbonate
- B. Calcium Carbonate
- C. Calcium Acetate
- D. Sodium Carbonate

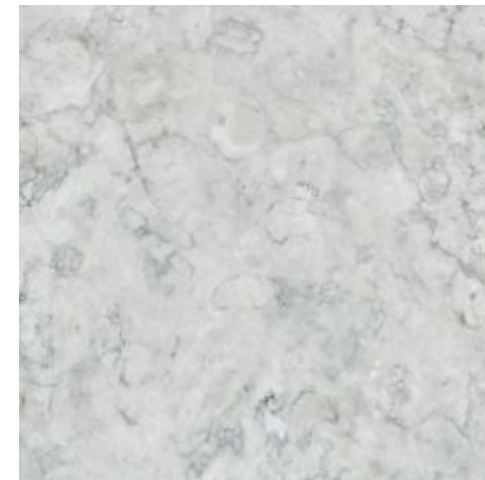
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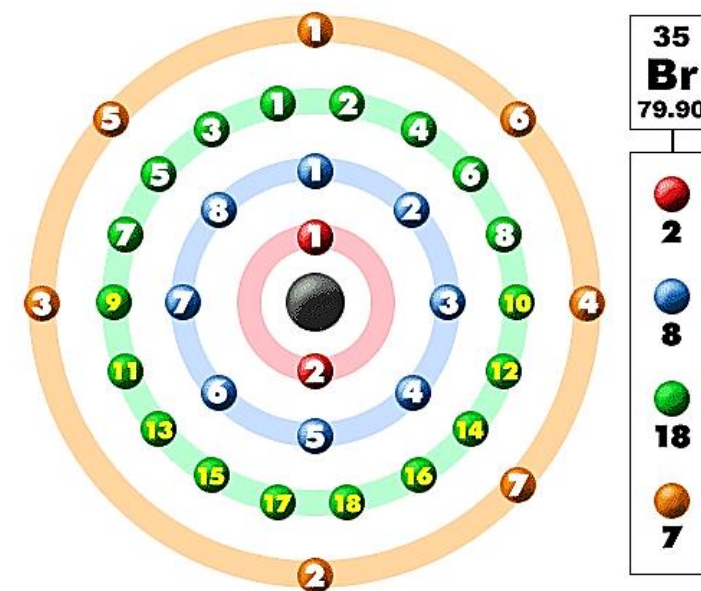
Chalk and Marble both have Calcium Carbonate

**Q) For an element with atomic number 35 which one of the following will be correct number of electrons in the valence shell based on Bohr's model of an atom?**

- A. 1
- B. 3
- C. 5
- D. 7

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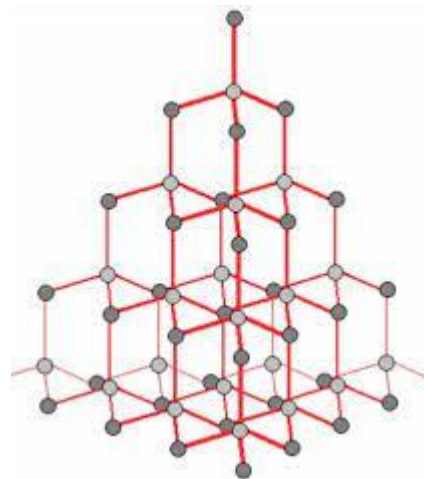


**Q) Which one of the following allotropes of carbon is isomorphous with crystalline silicon?**

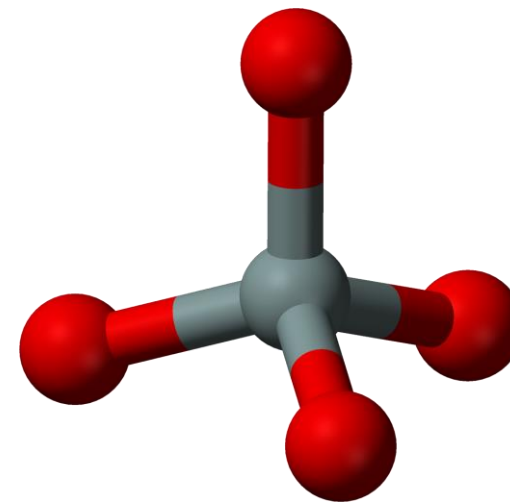
- A. Coke
- B. Diamond
- C. Graphite
- D. Coal

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Diamond



Silicon

**Q) Which one of the following is the colour of hydrogen gas?**

- A. Light Yellow
- B. Orange
- C. Black
- D. Colourless

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A. Light Yellow

B. Orange

C. Black

**D. Colourless**

- Hydrogen is from the greek work hydro
- Most abundant element in the universe
- Only element that can exist without neutrons
- Hydrogen is highly reactive

**Q) Which one of the following is not a pigment**

- A. Zinc Oxide
- B. Chalk
- C. White lead
- D. Silica

**Q) Which one of the following statements is not correct?**

- A. Most carbon compounds are good conductors of electricity
- B. Bonding in Organic compound is covalent
- C. Graphite is used as a Lubricant
- D. Diamond is an allotrope of carbon

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**A. Most carbon compounds are good conductors of electricity**

B. Bonding in Organic compound is covalent

C. Graphite is used as a Lubricant

D. Diamond is an allotrope of carbon

Only Graphite is a good conductor of electricity because of the presence of free electrons



**Q) The specific latent heat of vapourisation is the quantity of heat needed to change unit mass from**

- A. Liquid to vapour with a change of temperature
- B. Liquid to vapour without a change of temperature
- C. Vapour to liquid with a change of temperature
- D. Vapour to liquid without a change of temperature

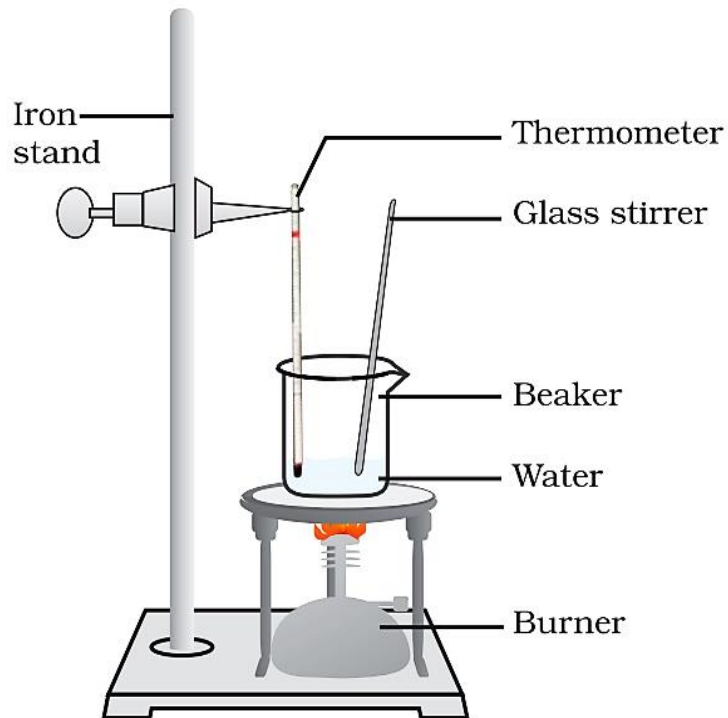


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- D. Vapour to liquid without a change of temperature

# LATENT HEAT OF VAPORIZATION

- The amount of heat energy required to change 1 kg of a liquid into a gas at atmospheric pressure at its boiling point is known as **Latent Heat of Vaporization**.



**Q) Evaporation from the surface of a given liquid takes place more rapidly when**

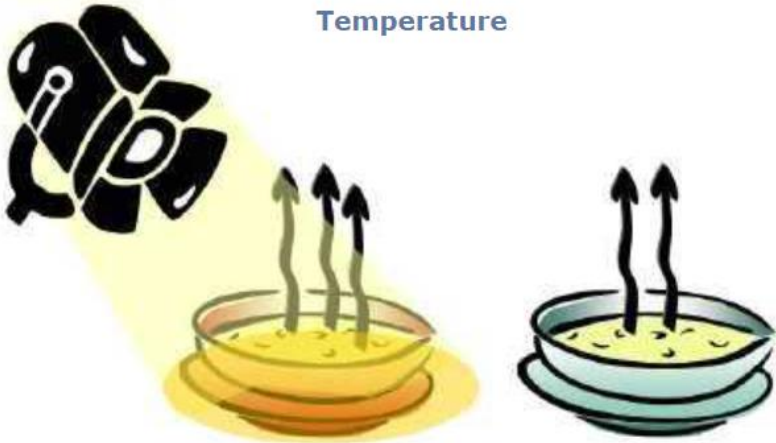
- A. The temperature is high and surface area of liquid is large
- B. The temperature is low and surface area of liquid is large
- C. The temperature is low and surface area of liquid is small
- D. The temperature is high and surface area of liquid is small

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- A. The temperature is high and surface area of liquid is large**
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- C. The temperature is low and surface area of liquid is small
- D. The temperature is high and surface area of liquid is small

# FACTORS AFFECTING EVAPORATION

Temperature



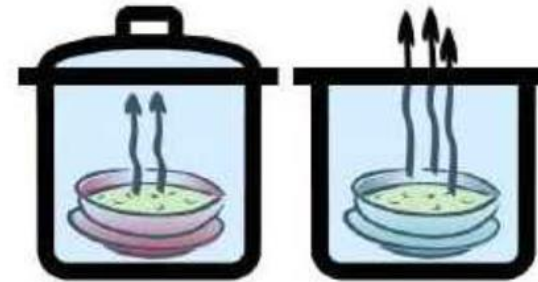
Wind



Exposed surface area



Humidity



**Q) Which one of the following is not a solution?**

- A. Alloy
- B. Milk
- C. Air
- D. Sugar

**Q) Which one of the following is not a solution?**

- A. Alloy
- B. Milk**
- C. Air
- D. Sugar



Milk is heterogenous mixture NOT a solution

**Q) Refining of the petroleum is carried out using which one of the following techniques?**

- A. Evaporation
- B. Fractional Distillation
- C. Separating Funnel
- D. Sublimation



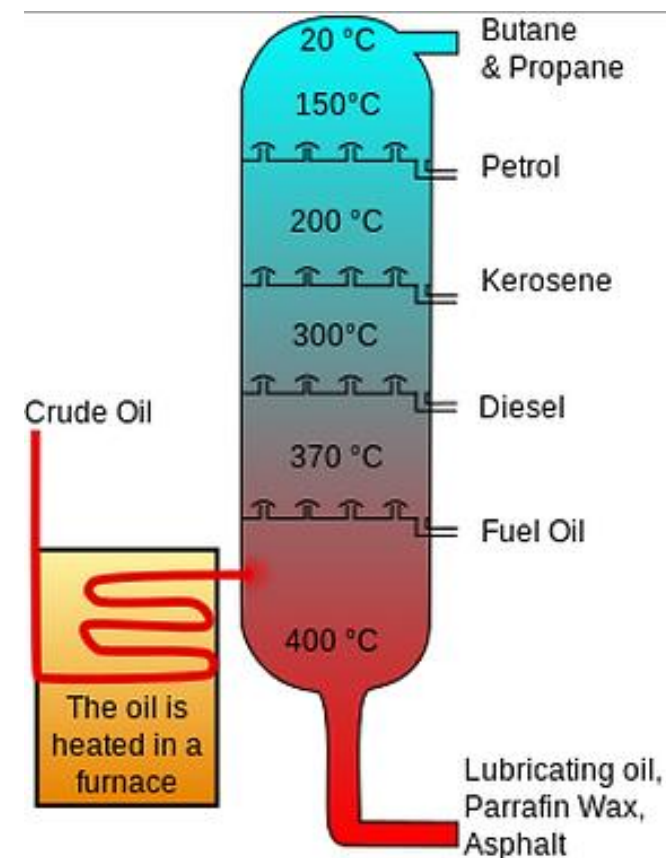
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**B. Fractional Distillation**

C. Separating Funnel

D. Sublimation



**Q) Which one of the following is a chemical change?**

- A. Dissolving sugar in water
- B. Melting of ice
- C. Crystallization
- D. Milk turning sour

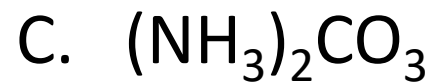
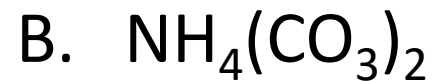
**Q) Which one of the following is a chemical change?**

- A. Dissolving sugar in water
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- D. Milk turning sour**



Milk becomes curd which is a new substance formed, Hence option D is a chemical change

**Q) Which one of the is the correct formula of ammonium carbonate?**



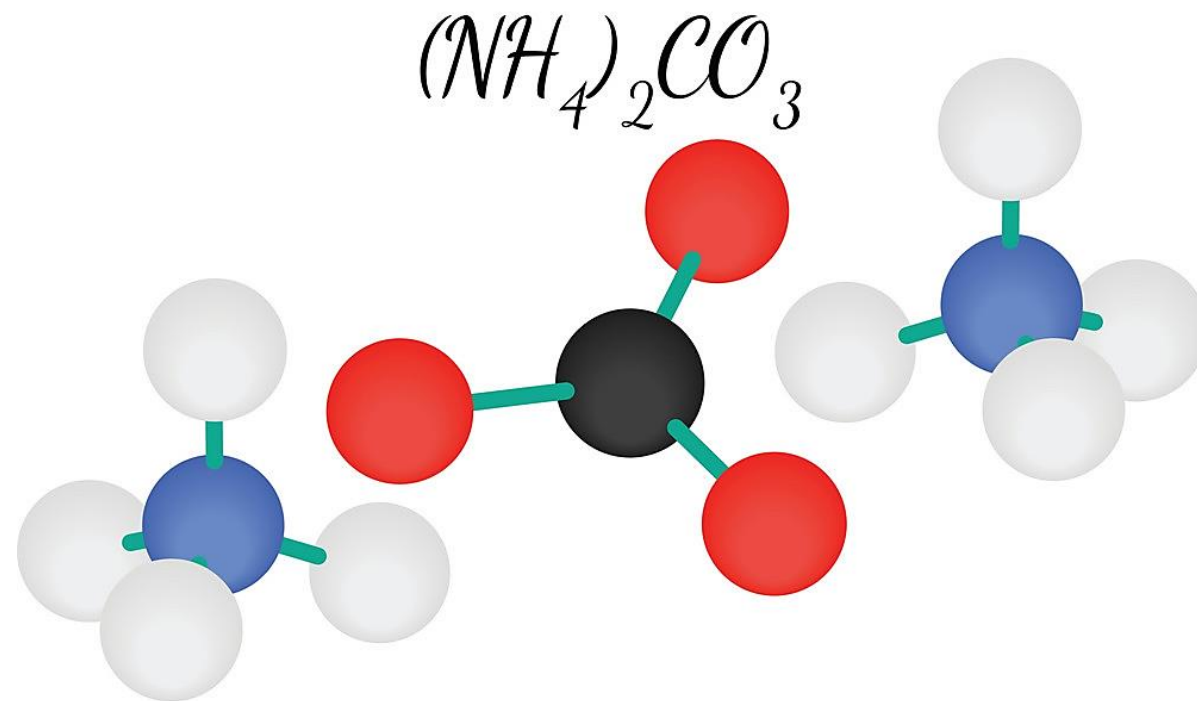
Q) Which one of the is the correct formula of ammonium carbonate?

A.  $(\text{NH}_4)_2\text{CO}_3$

B.  $\text{NH}_4(\text{CO}_3)_2$

C.  $(\text{NH}_3)_2\text{CO}_3$

D.  $\text{NH}_4\text{CO}_3$



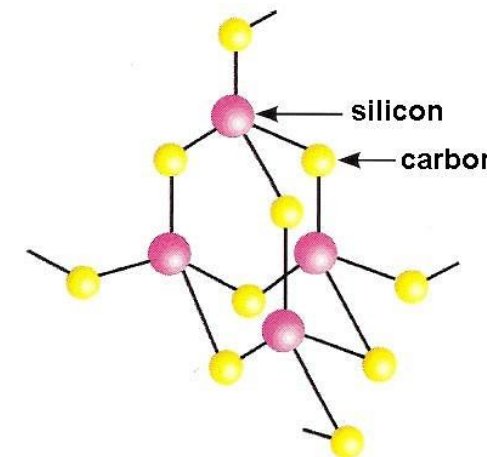
*Ammonium carbonate*

**Q) Which one of the following is a covalent compound?**

- A. Calcium oxide
- B. Sodium nitride
- C. Silicon carbide
- D. Zinc sulphide

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**Q) The mass number of argon is 40. Which one of the following statements is correct?**

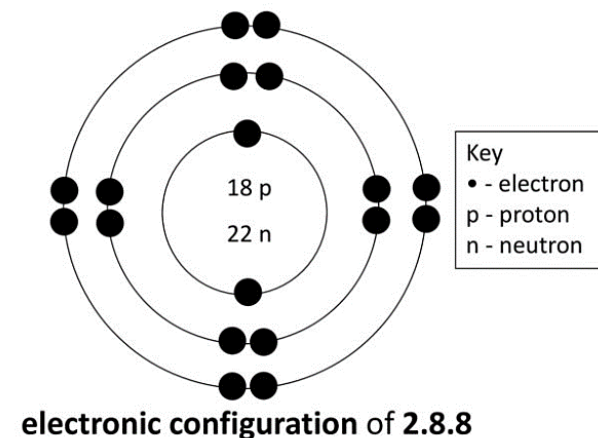
- A. The number of protons in Argon is 22
- B. The number of neutrons in Argon is 18
- C. The number of electrons in Argon is 18
- D. The sum of number of protons and electrons in Argon is 40



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- C. The number of electrons in Argon is 18**
- D. The sum of number of protons and electrons in Argon is 40

Argon-40 atom has 18 electrons



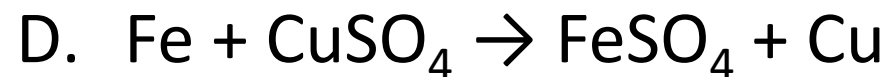
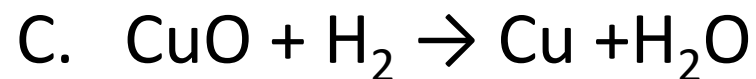
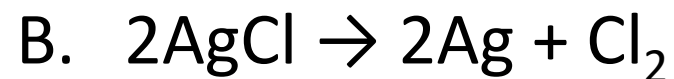
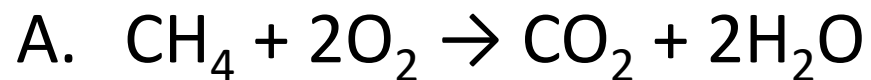
**Q) Which one of the following is the correct order of valencies of elements Ne, Si, N and Mg?**

- A.  $\text{Ne} < \text{Mg} < \text{N} < \text{Si}$
- B.  $\text{Si} < \text{N} < \text{Mg} < \text{Ne}$
- C.  $\text{Ne} < \text{N} < \text{Si} < \text{Mg}$
- D.  $\text{Mg} < \text{Ne} < \text{N} < \text{Si}$

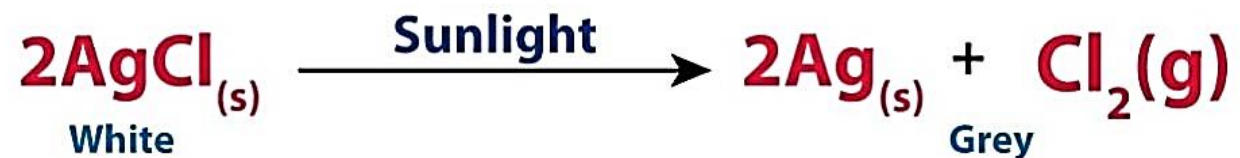
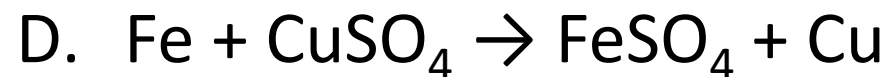
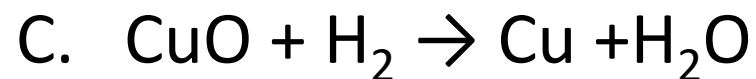
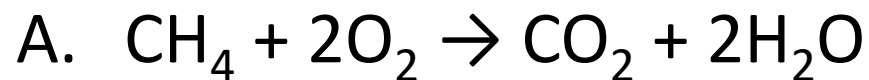
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- C.  $\text{Ne} < \text{N} < \text{Si} < \text{Mg}$
- D.  $\text{Mg} < \text{Ne} < \text{N} < \text{Si}$

**Q) Which one of the following reaction is an example of decomposition reaction?**



Q) Which one of the following reaction is an example of decomposition reaction?



**Q. In Rhodophyceae, the food is stored in the form of?**

- (a) Starch
- (b) Floridean Starch
- (c) Mannitol
- (d) Laminarin

**Q. In Rhodophyceae, the food is stored in the form of?**

- (a) Starch
- (b) Floridean Starch**
- (c) Mannitol
- (d) Laminarin

**Ans: (b)**

**Explanation:** In Red algae, food is stored in the form of Floridean Starch. In Brown algae, it is stored in the form of Laminarin and Mannitol. In Green algae, it is stored in the form of Starch.

**Q. Bryophytes are known as Amphibians of Plant Kingdom because?**

- (a) They are adapted to harsh climates
- (b) They can survive in marshy areas
- (c) They can adapt to both aquatic and terrestrial habitats
- (d) None of the above



**Q. Bryophytes are known as Amphibians of Plant Kingdom because?**

- (a) They are adapted to harsh climates
- (b) They can survive in marshy areas
- (c) They can adapt to both aquatic and terrestrial habitats**
- (d) None of the above

**Ans: (c)**

**Explanation:** They are also known as amphibians of plant kingdom because of their habitat adaptability in both aquatic and terrestrial environment.

**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 among the following provide peat?**

- (a) *Funaria*
- (b) *Polytrichum*
- (c) *Sphagnum*
- (d) None of the above

**Q. Which among the following provide peat?**

- (a) *Funaria*
- (b) *Polytrichum*
- (c) *Sphagnum*
- (d) None of the above

**Ans: (c)**

**Explanation:** *Sphagnum*, a moss, provide peat which is used as fuel.

**Q. The structures formed by sporophylls are?**

- (a) Strobili
- (b) Sporangium
- (c) Sex organs
- (d) Prothallus

**Q. The structures formed by sporophylls are?**

- (a) Strobili**
- (b) Sporangium
- (c) Sex organs
- (d) Prothallus

**Ans: (a)**

**Explanation:** Sporophylls form distinct compact structures called strobili or cones.

**Q. An example of Pteropsida?**

- (a) *Pteris*
- (b) *Dryopteris*
- (c) *Adiantum*
- (d) All the above



**Q. An example of Pteropsida?**

- (a) *Pteris*
- (b) *Dryopteris*
- (c) *Adiantum*
- (d) All the above**

**Ans: (d)**

**Explanation:** Pteropsida is one of the classes of Pteridophytes and all the three belong to the class Pteropsida.

**Q. Mycorrhiza can be observed with the following plant**

- (a) *Fucus*
- (b) *Cycas*
- (c) *Pinus*
- (d) *Selaginella*

**Q. Mycorrhiza can be observed with the following plant**

- (a) *Fucus*
- (b) *Cycas*
- (c) *Pinus*
- (d) *Selaginella*

**Ans: (c)**

**Explanation:** Fungal association in the form of mycorrhiza can be seen along with *Pinus*.

**Q. The leaf like photosynthetic organ in Phaeophyceae is?**

- (a) Strobili
- (b) Stalk
- (c) Frond
- (d) Stipe

**Q. The leaf like photosynthetic organ in Phaeophyceae is?**

- (a) Strobili
- (b) Stalk
- (c) Frond**
- (d) Stipe

**Ans: (c)**

**Explanation:** The plant body of Pheophyceae is usually attached to the substratum by a holdfast, and has a stalk, the stipe and leaf like photosynthetic organ – the frond.

**Q. Which of the is an example of colonial alga?**

- (a) *Ulothrix*
- (b) *Spirogyra*
- (c) *Volvox*
- (d) *Chlamydomonas*

**Q. Which of the is an example of colonial alga?**

- (a) *Ulothrix*
- (b) *Spirogyra*
- (c) ***Volvox***
- (d) *Chlamydomonas*

**Ans: (c)**

**Explanation:** *Volvox* is an example of colonial alga.

**Q. Which of the following algae can even store food as oil droplets?**

- (a) *Ectocarpus*
- (b) *Fucus*
- (c) *Porphyra*
- (d) *Chlamydomonas*



**Q. Which of the following algae can even store food as oil droplets?**

- (a) *Ectocarpus*
- (b) *Fucus*
- (c) *Porphyra*
- (d) *Chlamydomonas***

**Ans: (d)**

**Explanation:** Green algae or Chlorophyceae can store food in the form of oil droplets. *Chlamydomonas* is a green alga.

**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*
- b) *Culex pipiens*
- 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.

**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. A protein is synthesized in the endoplasmic reticulum bound ribosomes and it targets to the inner thylakoid space of chloroplast. How many double-layered membrane layers it has to pass to reach its destination?**

- a) 2
- b) 3
- c) 4
- d) 5

**Q. A protein is synthesized in the endoplasmic reticulum bound ribosomes and it targets to the inner thylakoid space of chloroplast. How many double-layered membrane layers it has to pass to reach its destination?**

- a) 2
- b) 3**
- c) 4
- d) 5

**Ans: (b)**

**Explanation:** A protein is synthesized in the endoplasmic reticulum bound ribosomes and it targets to the inner thylakoid space of chloroplast. It must pass three double-layered membrane layers to reach its destination. A thylakoid is a membrane-bound compartment inside chloroplasts and cyanobacteria. They are the site of the light-dependent reactions of photosynthesis. Thylakoids consist of a thylakoid membrane surrounding a thylakoid lumen.

**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

**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

**Ans: (c)**

**Explanation:** The most prominent roles of mitochondria are to produce the energy currency of the cell, ATP. Chloroplast is responsible for photosynthesis. Chloroplasts contain the molecule chlorophyll, which absorbs sunlight for photosynthesis. The ribosome is a complex molecular machine, found within all the living cells, that serves as the site of biological protein synthesis. Inside a cell, numerous organelles function to remove wastes. One of the key organelles involved in the digestion and waste removal is the lysosome. Lysosomes are organelles that contain digestive enzymes for intracellular digestion.

**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.

**Q. Which one among the following statements is correct?**

- a) Prokaryotic cells possess nucleus
- b) Cell membrane is present both in plant and animal cells
- c) Mitochondria and Chloroplasts are not found in Eukaryotic cells
- d) Ribosomes are present in Eukaryotic cells only

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- d) Ribosomes are present in Eukaryotic cells only

**Ans: (b)**

**Explanation:** Both plant and animal cells have Cell membrane.

**Q. Organ level of organisation is found in?**

- (a) Porifera
- (b) Coelenterata
- (c) Platyhelminthes
- (d) Echinodermata

**Q. Organ level of organisation is found in?**

- (a) Porifera
- (b) Coelenterata
- (c) Platyhelminthes**
- (d) Echinodermata

**Ans: (c)**

**Explanation:** Organ level of organisation is seen in Platyhelminthes or flat worms.

**Q. Which of the following has an asymmetrical body?**

- (a) Flatworms
- (b) Roundworms
- (c) Sponges
- (d) Insects

**Q. Which of the following has an asymmetrical body?**

- (a) Flatworms
- (b) Roundworms
- (c) Sponges**
- (d) Insects

**Ans: (c)**

**Explanation:** Asymmetry is observed in the organisms belonging to phylum Porifera or Sponges.

**Q. Which among the following is not a germ layer?**

- (a) Mesoderm
- (b) Ectoderm
- (c) Endoderm
- (d) Mesoglea



**Q. Which among the following is not a germ layer?**

- (a) Mesoderm
- (b) Ectoderm
- (c) Endoderm
- (d) Mesoglea**

**Ans: (d)**

**Explanation:** Mesoglea is an undifferentiated layer present between Ectoderm and Endoderm.

**Q. Eucoelom is categorized into?**

- (a) Schizocoelom
- (b) Enterocoelom
- (c) Both the above
- (d) None of the above

**Q. Eucoelom is categorized into?**

- (a) Schizocoelom
- (b) Enterocoelom
- (c) Both the above**
- (d) None of the above

**Ans: (c)**

**Explanation:** Eucoelom or true coelom is of two types – Schizocoelom and Enterocoelom. Schizocoelom develops as a split in the mesoderm sheet. Enterocoelom develops when mesoderm arises from the wall of the embryonic gut or enteron as hollow outgrowths which form this type of coelom.

**Q. Metamerism is seen in**

- (a) *Nereis*
- (b) *Pheretima*
- (c) *Hirudinaria*
- (d) All the above

**Q. Metamerism is seen in**

- (a) *Nereis*
- (b) *Pheretima*
- (c) *Hirudinaria*
- (d) All the above**

**Ans: (d)**

**Explanation:** Organisms of the phylum Annelida shows metamerism. Their body surface is distinctly marked out into segments or metameres.

**Q. Which of the following divisions lack jaws?**

- (a) Gnathostomata
- (b) Cyclostomata
- (c) Agnatha
- (d) None of the above

**Q. Which of the following divisions lack jaws?**

- (a) Gnathostomata
- (b) Cyclostomata
- (c) Agnatha**
- (d) None of the above

**Ans: (c)**

**Explanation:** Agnatha is the division under Sub-phylum Vertebrata which lack jaws. Cyclostomata is a class under the division Agnatha which also lack jaws.

**Q. Tetrapoda includes the following classes?**

- (a) Mammals
- (b) Aves
- (c) Reptiles
- (d) All the above



**Q. Tetrapoda includes the following classes?**

- (a) Mammals
- (b) Aves
- (c) Reptiles
- (d) All the above**

**Ans: (d)**

**Explanation:** Tetrapoda includes Amphibians, Reptiles, Aves and Mammals.

**Q. The animals which can regulate their body temperature are termed as?**

- (a) Blooded
- (b) Homoiotherms
- (c) Cold-blooded
- (d) Poikilotherms

**Q. The animals which can regulate their body temperature are termed as?**

- (a) Blooded
- (b) Homoiotherms**
- (c) Cold-blooded
- (d) Poikilotherms

**Ans: (b)**

**Explanation:** Homoiothermous animals can regulate their body temperature. Also called as warm-blooded animals.

**Q. Creeping mode of locomotion is seen in**

- (a) Platyhelminthes
- (b) Arthropoda
- (c) Amphibia
- (d) Reptilia

**Q. Creeping mode of locomotion is seen in**

- (a) Platyhelminthes
- (b) Arthropoda
- (c) Amphibia
- (d) Reptilia**

**Ans: (d)**

**Explanation:** Reptilia, the name refers to their creeping or crawling mode of locomotion.

**Q. What is the scientific name of Kangaroo?**

- (a) *Panthera leo*
- (b) *Pteropus*
- (c) *Macropus*
- (d) *Macaca*

**Q. What is the scientific name of Kangaroo?**

- (a) *Panthera leo*
- (b) *Pteropus*
- (c) ***Macropus***
- (d) *Macaca*

**Ans: (c)**

**Explanation:** *Macropus* is the Scientific name of Kangaroo.

**Q. An example of flightless bird?**

- (a) Ostrich
- (b) Sparrow
- (c) Crow
- (d) Pigeon



**Q. An example of flightless bird?**

- (a) Ostrich**
- (b) Sparrow
- (c) Crow
- (d) Pigeon

**Ans: (a)**

**Explanation:** Ostrich is an example of Flightless birds.

**Q. Amniotic eggs were first developed in the following?**

- (a) Amphibia
- (b) Reptilia
- (c) Aves
- (d) Mammals

**Q. Amniotic eggs were first developed in the following?**

- (a) Amphibia
- (b) Reptilia**
- (c) Aves
- (d) Mammals

**Ans: (b)**

**Explanation:** Amniotic eggs were first found in Reptilia.

**Q. Which one of the following groups of cellular organelles contains DNA?**

- a) Mitochondria, nucleus, chloroplast
- b) Mitochondria, Golgi bodies, nucleus
- c) Mitochondria, plasma membrane, nucleus
- d) Chloroplast, nucleus, ribosomes

**Q. Which one of the following groups of cellular organelles contains DNA?**

- a) Mitochondria, nucleus, chloroplast**
- b) Mitochondria, Golgi bodies, nucleus
- c) Mitochondria, plasma membrane, nucleus
- d) Chloroplast, nucleus, ribosomes

**Ans: (a)**

**Explanation:** Mitochondria, Nucleus and Chloroplast has DNA.

**Q. One of the additional functions of Smooth Endoplasmic Reticulum (SER) is**

- a) protein synthesis
- b) lipid synthesis
- c) storage of biomolecules
- d) detoxification of toxic substances

**Q. One of the additional functions of Smooth Endoplasmic Reticulum (SER) is**

- a) protein synthesis
- b) lipid synthesis
- c) storage of biomolecules
- d) detoxification of toxic substances**

**Ans: (d)**

**Explanation:** The smooth ER is normally involved in the synthesis of lipids, like cholesterol and phospholipids. Additionally, it is involved in the detoxification of toxic substances like drugs and harmful compounds.

**Q. Which one of the following is an organelle that is NOT found in Prokaryotic cells?**

- a) Cell wall
- b) Mitochondria
- c) Plasma membrane
- d) Ribosomes



**Q. Which one of the following is an organelle that is NOT found in Prokaryotic cells?**

- a) Cell wall
- b) Mitochondria**
- c) Plasma membrane
- d) Ribosomes

**Ans: (b)**

**Explanation:** Cells that lack a membrane bound nucleus are called Prokaryotic cells. Mitochondria is found in eukaryotic cells but absent in Prokaryotic cells.

**Q. Within an animal cell, the most abundant inorganic constituent of Protoplasm is?**

- a) sodium and potassium salt
- b) water
- c) iron
- d) Phosphate

**Q. Within an animal cell, the most abundant inorganic constituent of Protoplasm is?**

- a) sodium and potassium salt
- b) water**
- c) iron
- d) Phosphate

**Ans: (b)**

**Explanation:** Water is the most abundant constituent.

**Q. Which one of the following is not found in animal cells?**

- a) Free ribosomes
- b) Mitochondria
- c) Nucleolus
- d) Cell wall

**Q. Which one of the following is not found in animal cells?**

- a) Free ribosomes
- b) Mitochondria
- c) Nucleolus
- d) Cell wall**

**Ans: (d)**

**Explanation:** Animal cells lack a cell wall. Plant cells have a cell wall.

**Q. Which one of the following functions is not carried out by smooth endoplasmic reticulum?**

- a) Transport of materials
- b) Synthesis of lipid
- c) Synthesis of proteins
- d) Synthesis of steroid hormones

**Q. Which one of the following functions is not carried out by smooth endoplasmic reticulum?**

- a) Transport of materials
- b) Synthesis of lipid
- c) Synthesis of proteins**
- d) Synthesis of steroid hormones

**Ans: (c)**

**Explanation:** SER cannot synthesize proteins as they don't have ribosomes.

**Q. Which one of the following cell organelles mainly functions as storehouse of digestive enzymes?**

- a) Desmosomes
- b) Ribosomes
- c) Lysosomes
- d) Vacuoles



**Q. Which one of the following cell organelles mainly functions as storehouse of digestive enzymes?**

- a) Desmosomes
- b) Ribosomes
- c) Lysosomes**
- d) Vacuoles

**Ans: (c)**

**Explanation:** Lysosomes function as the digestive system of the cell.

**Q. Lysosome is formed from which of the following cell organelles?**

- a) Nucleus
- b) Endoplasmic reticulum
- c) Golgi bodies
- d) Ribosomes

**Q. Lysosome is formed from which of the following cell organelles?**

- a) Nucleus
- b) Endoplasmic reticulum
- c) Golgi bodies**
- d) Ribosomes

**Ans: (c)**

**Explanation:** Lysosomes are formed from the fusion of vesicles from the Golgi bodies.

**Q. To which of the following the cell theory is not applied**

- (a) Algae
- (b) Fungi
- (c) Virus
- (d) None

**Q. To which of the following the cell theory is not applied**

- (a) Algae
- (b) Fungi
- (c) Virus**
- (d) None

**Ans: (c)**

**Explanation:** Virus is considered as both a living as well as a non-living organism. So, cell theory is not applied to Viruses.

**Q. Mitochondrion lacking its outer membrane leaving its inner membrane intact is called as**

- (a) Leucoplast
- (b) Mitoplast
- (c) Chromoplast
- (d) Plastids

**Q. Mitochondrion lacking its outer membrane leaving its inner membrane intact is called as**

- (a) Leucoplast
- (b) Mitoplast**
- (c) Chromoplast
- (d) Plastids

**Ans: (b)**

**Explanation:** A mitoplast is a mitochondrion that has been stripped of its outer membrane leaving the inner membrane intact.

**Q. Bacteria which can take up the gram staining**

- (a) Gram positive
- (b) Gram negative
- (c) Both (a) and (b)
- (d) None of the above



**Q. Bacteria which can take up the gram staining**

- (a) Gram positive**
- (b) Gram negative
- (c) Both (a) and (b)
- (d) None of the above

**Ans: (a)**

**Explanation:** Bacteria can be classified into two groups on the basis of the differences in the cell envelopes and the manner in which they respond to the staining procedure developed by Gram viz., those that take up the gram stain are Gram positive and the others that do not are called Gram negative bacteria.

**Q. Which of the following is the function of Cytoskeleton?**

- (a) Provides mechanical support to the cell
- (b) Motility of the cell
- (c) Maintaining the shape of the cell
- (d) All the above

**Q. Which of the following is the function of Cytoskeleton?**

- (a) Provides mechanical support to the cell
- (b) Motility of the cell
- (c) Maintaining the shape of the cell
- (d) All the above**

**Ans: (d)**

**Explanation:** An elaborate network of filamentous proteinaceous structures present in the cytoplasm is collectively referred to as the cytoskeleton. The cytoskeleton in a cell are involved in many functions such as mechanical support, motility, maintenance of the shape of the cell.

**Q. Hair-like outgrowths of the cell membrane**

- (a) Cilia
- (b) Flagella
- (c) Both (a) and (b)
- (d) None of the above

## Q. Hair-like outgrowths of the cell membrane

- (a) Cilia
- (b) Flagella
- (c) Both (a) and (b)
- (d) None of the above

**Ans: (c)**

**Explanation:** Cilia (sing.: cilium) and flagella (sing.: flagellum) are hair-like outgrowths of the cell membrane. Cilia are small structures which work like oars, causing the movement of either the cell or the surrounding fluid. Flagella are comparatively longer and responsible for cell movement.

**Q. The proteinaceous central part of the Centriole is**

- (a) Hub
- (b) Radial
- (c) Spokes
- (d) Axoneme

**Q. The proteinaceous central part of the Centriole is**

- (a) Hub**
- (b) Radial
- (c) Spokes
- (d) Axoneme

**Ans: (a)**

**Explanation:** The central part of the proximal region of the centriole is also proteinaceous and called the hub, which is connected with tubules of the peripheral triplets by radial spokes made of protein. The centrioles form the basal body of cilia or flagella.

**Q. The two subunits of Eukaryotic Ribosomes are**

- (a) 60S
- (b) 40S
- (c) 30S
- (d) Both (a) and (b)



**Q. The two subunits of Eukaryotic Ribosomes are**

- (a) 60S
- (b) 40S
- (c) 30S
- (d) Both (a) and (b)**

**Ans: (d)**

**Explanation:** The eukaryotic ribosomes are 80S while the prokaryotic ribosomes are 70S. Each ribosome has two subunits, larger and smaller subunits. The two subunits of 80S ribosomes are 60S and 40S while that of 70S ribosomes are 50S and 30S.

**Q. How many peripheral fibrils are found in the centriole of a basal body?**

- (a) 18
- (b) 27
- (c) 31
- (d) 40

**Q. How many peripheral fibrils are found in the centriole of a basal body?**

- (a) 18
- (b) 27**
- (c) 31
- (d) 40

**Ans: (b)**

**Explanation:** Both the centrioles in a centrosome lie perpendicular to each other in which each has an organization like the cartwheel. They are made up of nine evenly spaced peripheral fibrils of tubulin protein. Each of the peripheral fibril is a triplet. The adjacent triplets are also linked.

**Q. Semiautonomous organelles are**

- (a) Chloroplasts
- (b) Mitochondria
- (c) Both (a) and (b)
- (d) None of the above

**Q. Semiautonomous organelles are**

- (a) Chloroplasts
- (b) Mitochondria
- (c) Both (a) and (b)**
- (d) None of the above

**Ans: (c)**

**Explanation:** Chloroplast and mitochondria are called semi-autonomous organelles because they have their own genetic material (DNA) and are capable of synthesizing proteins required for their functioning. Semi- autonomous organelles are those organelles which can survive on their own. - They have their own DNA, RNA, and proteins.

**Q. The ribosomes found in Chloroplasts are**

- (a) 70S
- (b) 80S
- (c) 60S
- (d) 50S

**Q. The ribosomes found in Chloroplasts are**

- (a) 70S**
- (b) 80S
- (c) 60S
- (d) 50S

**Ans: (a)**

**Explanation:** Chloroplasts are green colored plastids containing chlorophylls and carotenoids. These double membranous structures contain thylakoids in their stroma. The ribosomes of the chloroplasts are smaller – 70S.

**Q. Group for similar cells function together to form**

- (a) Cell wall
- (b) Tissues
- (c) Organs
- (d) Organ system



**Q. Group for similar cells function together to form**

- (a) Cell wall
- (b) Tissues**
- (c) Organs
- (d) Organ system

**Ans: (b)**

**Explanation:** In multicellular animals, a group of similar cells along with intercellular substances perform a specific function. Such an organisation is called tissue.

**Q. The number of types of tissues found in our body**

- (a) 1
- (b) 2
- (c) 3
- (d) 4

**Q. The number of types of tissues found in our body**

- (a) 1
- (b) 2
- (c) 3
- (d) 4**

**Ans: (d)**

**Explanation:** All complex animals consist of only four basic types of tissues.

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<b>HOT &amp; NEW</b>  <b>90 PEOPLE ONLINE NOW</b> <b>OIR Test and PPDT Online Course – Officers Intelligence Rating Test</b> ★★★★★ 5 (50) <b>₹ 2,999.00</b>	<b>BEST SELLER</b>  <b>98 PEOPLE ONLINE NOW</b> <b>MNS Military Nursing Service Exam Online Course 2022</b> ★★★★★ 5 (44) <b>₹ 4,999.00</b>	<b>HOT &amp; NEW</b>  <b>37 PEOPLE ONLINE NOW</b> <b>AFCAT Exam Online Mock Test Series</b> ★★★★★ 5 (65) <b>₹ 299.00</b>	<b>BEST SELLER</b>  <b>36 PEOPLE ONLINE NOW</b> <b>CDS Exam Online Mock Test Series</b> ★★★★★ 5 (79) <b>₹ 299.00</b>	<b>BEST SELLER</b>  <b>18 PEOPLE ONLINE NOW</b> <b>NDA Exam Online Mock Test Series</b> ★★★★★ 5 (72) <b>₹ 299.00</b>	<b>HOT &amp; NEW</b>  <b>37 PEOPLE ONLINE NOW</b> <b>UPSC CAPF Assistant Commandant Online Course 2022</b> ★★★★★ 5 (46) <b>₹ 4,999.00</b>

