

Courses

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CDS 2 2022

COMPLETE

CHEMISTRY & BIOLOGY

LIVE  **CLASS**

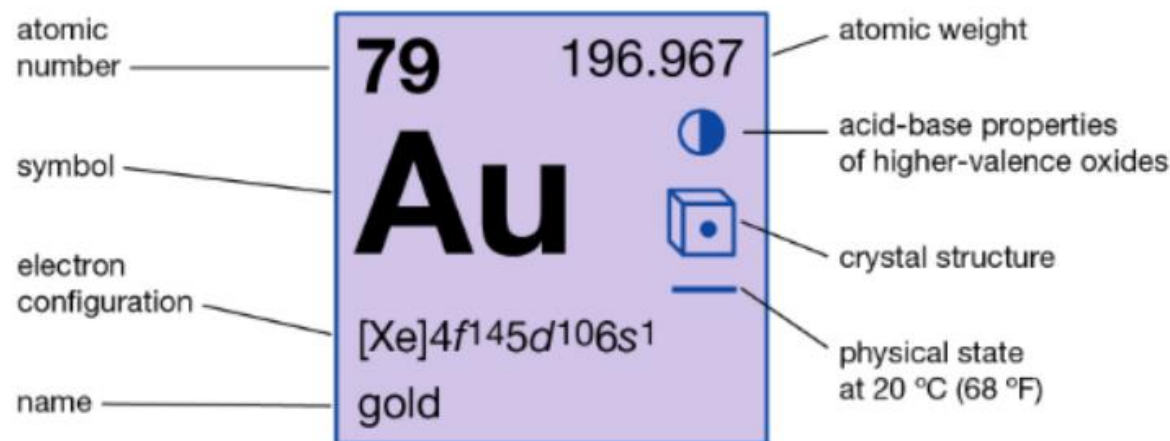


Q) Which one of the following metals has both malleability and ductility properties?

- A. Na
- B. Au
- C. Ce
- D. He

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Gold is the most malleable. Just 1g of gold can be beaten into a thin film covering 1 square meter.

Gold is also extremely ductile

Q) Aluminium is manufactured from—

- A. Copper ore
- B. Bauxite ore
- C. Mica ore
- D. Manganese ore

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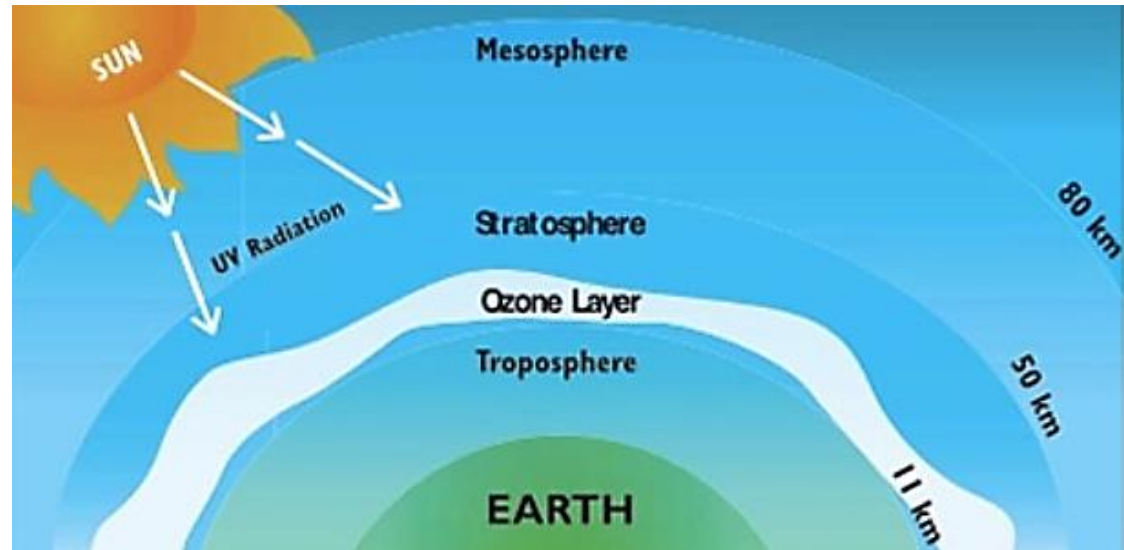
Alumina and bauxite are the two main raw materials in the aluminium making process. Aluminium is obtained by the electrolysis of alumina which extracts pure aluminium metal from alumina.

Q) Ozone layer, which absorbs the ultra-violet radiation, is found in which one of the following layers of the atmosphere ?

- A. Ionosphere
- B. Troposphere
- C. Mesosphere
- D. Stratosphere

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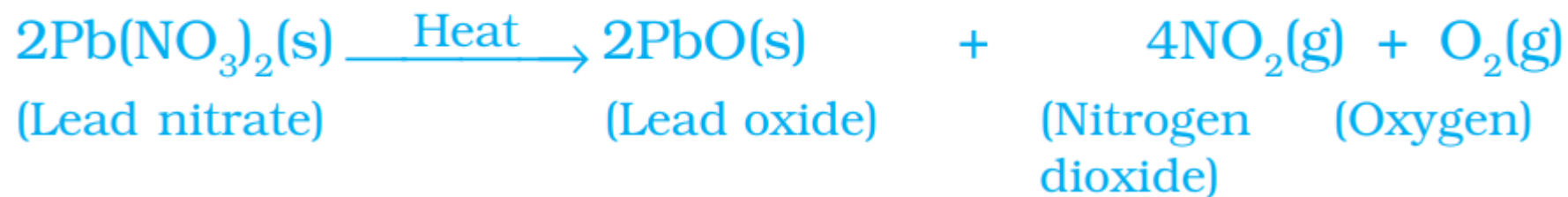
The ozone layer is a natural layer of gas in the upper atmosphere that protects humans and other living things from harmful ultraviolet (UV) radiation from the sun.

Q) When we heat lead nitrate $[\text{Pb}(\text{NO}_3)_2]$ in a boiling tube, we observe the emission of brown fumes. Which one of the following is the brown gas?

- A. NO
- B. N_2O_2
- C. NO_3
- D. NO_2

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- C. NO_3
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Q) A solution contains 20 g of solute in 180 g of solvent. If the solvent is water, what is the concentration of the solution in terms of mass by mass percentage?

- A. 11.1%
- B. 22.2%
- C. 10%
- D. 20%

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- C. 10%**
- D. 20%

- Given
 - Mass of solute = 20g
 - Mass of solvent = 180g
- Mass of solution = 180+20g = 200g

- **Concentration = $\frac{20 \times 100}{200} = 10\%$**

Q) In an observation, α -particles, β -particles and γ -rays have the same energies. Their penetrating power in a given medium in increasing order will be

- A. α, β, γ
- B. β, γ, α
- C. α, γ, β
- D. β, α, γ

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A. α, β, γ

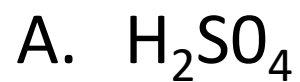
B. β, γ, α

C. α, γ, β

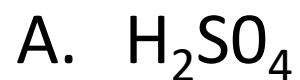
D. β, α, γ

Alpha particles can be blocked by a few pieces of paper. Beta particles can pass through paper but are stopped by aluminum foil. Gamma rays are the most difficult to stop and require concrete, lead or other heavy shielding to block them

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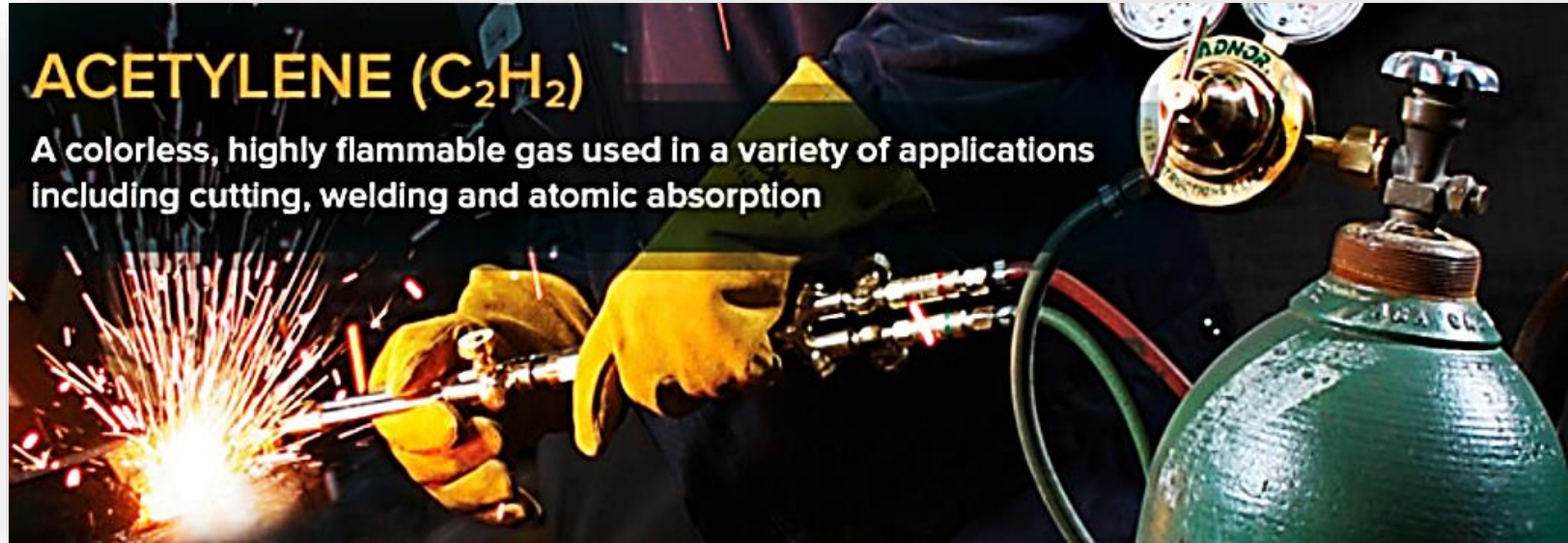
NaCl has the same equivalent weight and molecular weight

Q) Which one among the following fuels is used in gas welding?

- A. LPG
- B. Ethylene
- C. Methane
- D. Acetylene

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Acetylene is generally used as fuel in gas welding

Q) Which one among the following metals is prominently used in mobile phone batteries?

- A. Copper
- B. Zinc
- C. Nickel
- D. Lithium


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WHY LITHIUM-ION?

**ZERO MAINTENANCE:
NO MORE...**

- Watering
- Acid
- Spills
- Fumes
- Cleaning
- Equalizing

2X 
FASTER CHARGING
TIME OVER LEAD-ACID BATTERIES

23% 
MORE EFFICIENT
THAN LEAD-ACID BATTERIES

Lithium (Li) metal is prominently used in mobile phone batteries. Li-Poly is the latest and most advanced technology for cell phone batteries. This makes the batteries ultra-light weight. They do not suffer from memory effect and deliver up to 40 per cent more battery capacity than a Nickel Metal Hybrid (NiMH) of the same size

Q) Who among the following proposed that atom is indivisible?

- A. Dalton
- B. Berzelius
- C. Rutherford
- D. Avogadro

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Dalton proposed that atom is indivisible



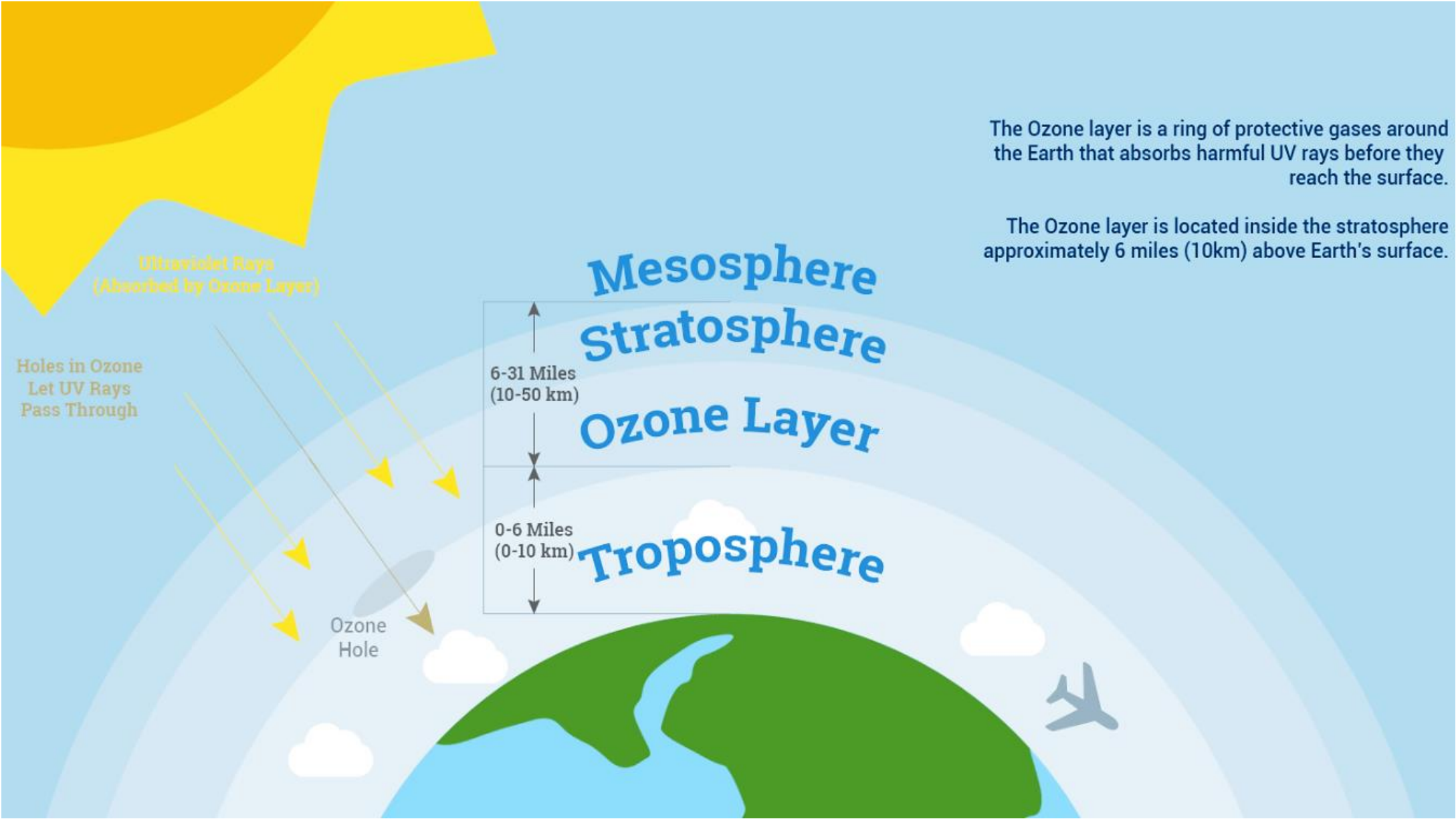
Q) Ozone layer of the Earth's atmosphere is important for the living organisms because it

- A. Prevents entry of ultra-violet rays.
- B. Prevents entry of x-rays.
- C. Maintains level of oxygen on the earth.
- D. Prevents acid rain on the earthchemical energy.

Q) Ozone layer of the Earth's atmosphere is important for the living organisms because it

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Ozone layer of the Earth's atmosphere is important for the living organisms because it prevents entry of ultra-violet rays.



The Ozone layer is a ring of protective gases around the Earth that absorbs harmful UV rays before they reach the surface.

The Ozone layer is located inside the stratosphere approximately 6 miles (10km) above Earth's surface.

Q) How many elements are there in the 5th period of modern periodic table?

- A. 2
- B. 8
- C. 18
- D. 36

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A. 2

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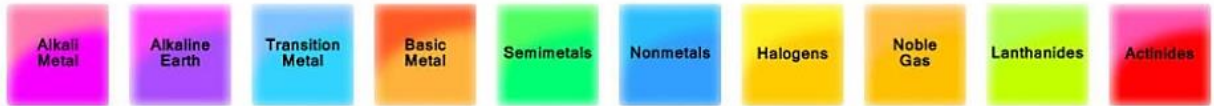
D. 36

There are 18 elements in the 5th period of the modern periodic table.

Periodic Table of the Elements

1 1IA 11A																	18 VIIIA 8A
1 H Hydrogen 1.0079	2 IIA 2A											13 IIIA 3A	14 IVA 4A	15 VA 5A	16 VIA 6A	17 VIIA 7A	2 He Helium 4.00260
3 Li Lithium 6.941	4 Be Beryllium 9.01218											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.00674	8 O Oxygen 15.9994	9 F Fluorine 18.998403	10 Ne Neon 20.1797
11 Na Sodium 22.989768	12 Mg Magnesium 24.305	3 IIIB 3B	4 IVB 4B	5 VB 5B	6 VIB 6B	7 VIIB 7B	8 VIII 8	9 VIII 8	10 VIII 8	11 IB 1B	12 IIB 2B	13 Al Aluminum 26.981539	14 Si Silicon 28.0855	15 P Phosphorus 30.973762	16 S Sulfur 32.066	17 Cl Chlorine 35.4527	18 Ar Argon 39.948
19 K Potassium 39.0983	20 Ca Calcium 40.078	21 Sc Scandium 44.95591	22 Ti Titanium 47.88	23 V Vanadium 50.9415	24 Cr Chromium 51.9961	25 Mn Manganese 54.938	26 Fe Iron 55.847	27 Co Cobalt 58.9332	28 Ni Nickel 58.6934	29 Cu Copper 63.546	30 Zn Zinc 65.39	31 Ga Gallium 69.732	32 Ge Germanium 72.64	33 As Arsenic 74.92159	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.80
37 Rb Rubidium 85.4678	38 Sr Strontium 87.62	39 Y Yttrium 88.90585	40 Zr Zirconium 91.224	41 Nb Niobium 92.90638	42 Mo Molybdenum 95.94	43 Tc Technetium 98.9072	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.9055	46 Pd Palladium 106.42	47 Ag Silver 107.8682	48 Cd Cadmium 112.411	49 In Indium 114.818	50 Sn Tin 118.71	51 Sb Antimony 121.760	52 Te Tellurium 127.6	53 I Iodine 126.90447	54 Xe Xenon 131.29
55 Cs Cesium 132.90543	56 Ba Barium 137.327	57-71	72 Hf Hafnium 178.49	73 Ta Tantalum 180.9479	74 W Tungsten 183.85	75 Re Rhenium 186.207	76 Os Osmium 190.23	77 Ir Iridium 192.22	78 Pt Platinum 195.08	79 Au Gold 196.9665	80 Hg Mercury 200.59	81 Tl Thallium 204.3833	82 Pb Lead 207.2	83 Bi Bismuth 208.98037	84 Po Polonium [208.9824]	85 At Astatine 209.9871	86 Rn Radon 222.0176
87 Fr Francium 223.0197	88 Ra Radium 226.0254	89-103	104 Rf Rutherfordium [261]	105 Db Dubnium [262]	106 Sg Seaborgium [266]	107 Bh Bohrium [264]	108 Hs Hassium [269]	109 Mt Meitnerium [268]	110 Ds Darmstadtium [269]	111 Rg Roentgenium [272]	112 Cn Copernicium [277]	113 Uut Ununtrium unknown	114 Uuq Ununquadium [289]	115 Uup Ununpentium unknown	116 Uuh Ununhexium [298]	117 Uus Ununseptium unknown	118 Uuo Ununoctium unknown

Lanthanide Series	57 La Lanthanum 138.9055	58 Ce Cerium 140.115	59 Pr Praseodymium 140.90765	60 Nd Neodymium 144.24	61 Pm Promethium 144.9127	62 Sm Samarium 150.36	63 Eu Europium 151.9655	64 Gd Gadolinium 157.25	65 Tb Terbium 158.92534	66 Dy Dysprosium 162.50	67 Ho Holmium 164.93032	68 Er Erbium 167.26	69 Tm Thulium 168.93421	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.967
Actinide Series	89 Ac Actinium 227.0278	90 Th Thorium 232.0381	91 Pa Protactinium 231.03688	92 U Uranium 238.0289	93 Np Neptunium 237.0482	94 Pu Plutonium 244.0642	95 Am Americium 243.0614	96 Cm Curium 247.0703	97 Bk Berkelium 247.0703	98 Cf Californium 251.0796	99 Es Einsteinium [254]	100 Fm Fermium 257.0951	101 Md Mendelevium 258.1	102 No Nobelium 259.1009	103 Lr Lawrencium [262]

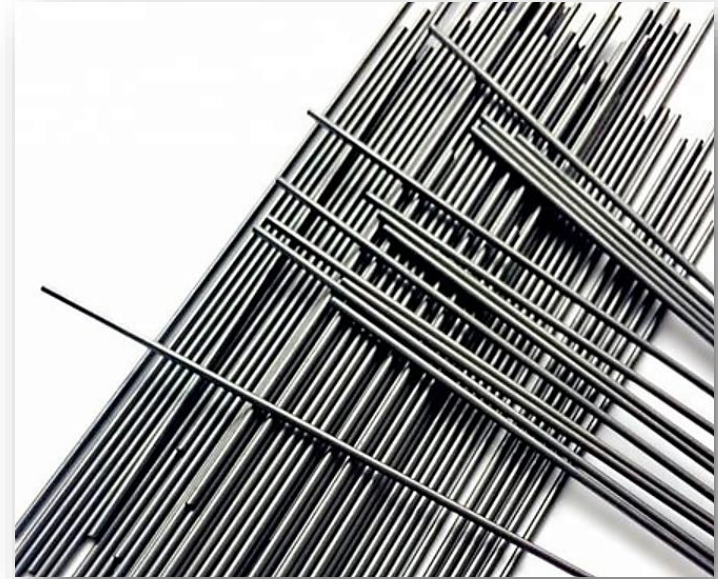


Q) Which one among the following is used in making lead pencils?

- A. Charcoal
- B. Graphite
- C. Coke
- D. Carbon Black

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Graphite is used in making lead pencil. Graphite has a covalent structure made of carbon atoms.

Q) Sodium metal should be stored in

- A. Alcohol
- B. Kerosene Oil
- C. Water
- D. Hydrochloric Acid

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Sodium metal should be stored in kerosene oil. It is because sodium will react violently with water

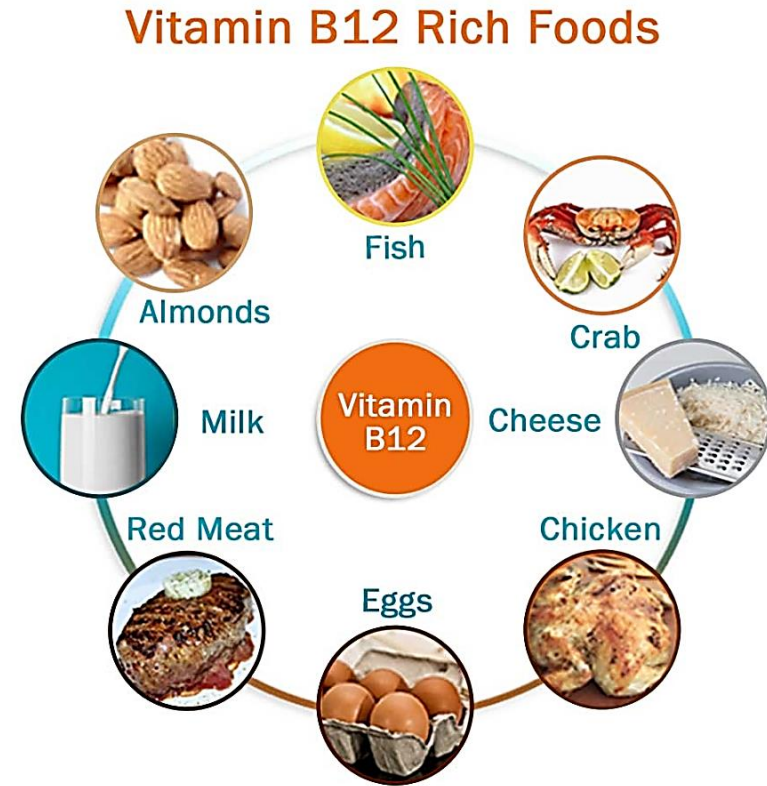
The kerosene isolates the sodium sample from the air. It should be noted that kerosene and mineral oil are the only chemicals that make the sodium inert.

Q) Cobalt is associated with

- A. Growth hormone
- B. Vitamin B₁₂
- C. Haemoglobin
- D. Intestinal enzyme

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This vitamin is essential for making red blood cells in the body. Vitamin B12, also called cobalamin, is a water-soluble vitamin

Q) The handle of pressure cookers is made of plastic because it should be made a non-conductor of heat. The plastic used there is the first man-made plastic, which is

- A. Polythene
- B. Terylene
- C. Nylon
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Bakelite is a thermosetting polymer known for its heat resistance. It is also used in insulators

Thermosetting

Bakelite



Plug



Switches



Sockets



Handles

Bakelite is an **excellent insulator** as it is poor conductor of heat & electricity

Q) Which one of the following gases is released mostly from landfills in urban areas?

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Methane and carbon dioxide make up 90 to 98% of landfill gas. The remaining 2 to 10% includes nitrogen, oxygen, ammonia, sulfides, hydrogen and various other gases

Q) Which one of the following is not an allotrope of carbon?

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

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A. Coal

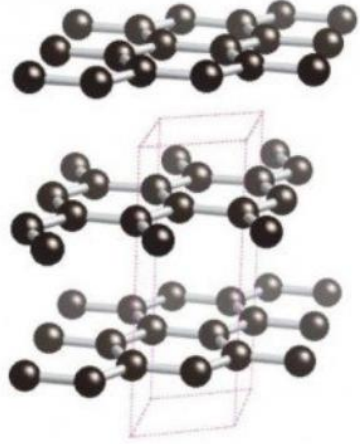
B. Diamond

C. Graphite

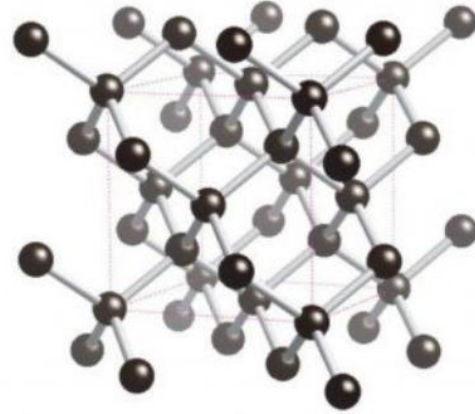
D. Graphene

Coal is not an allotrope of carbon because it is not 100% carbon. It contains lot of silica, sulphur and other compounds of carbon apart from carbon

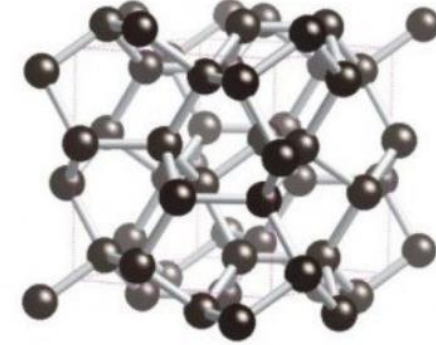
ALLOTROPES OF CARBON



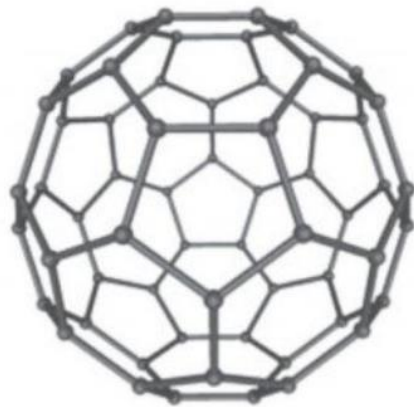
graphite



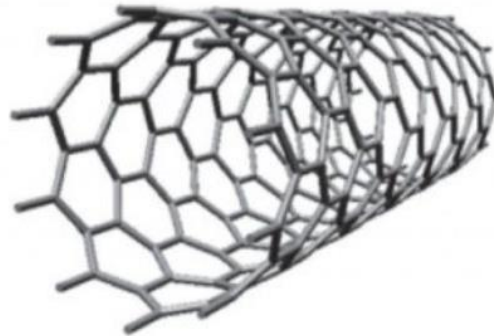
diamond



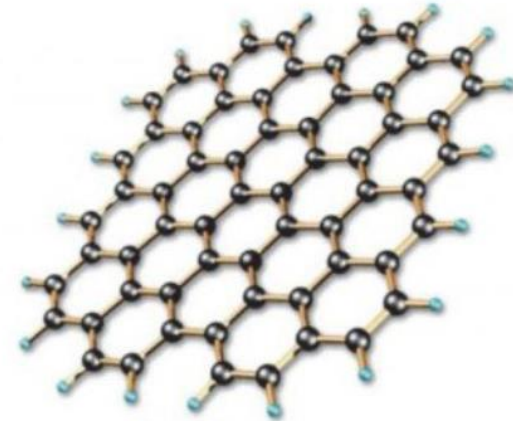
BC8



fullerene



nanotube



graphene

Q) In paper manufacturing, degumming of the raw material is done using

- A. Sulphuric acid
- B. Bleaching powder
- C. Caustic soda
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In the chemical pulping process, caustic soda is usually used to remove the lignin that binds the fibres. So, for degumming of raw material, caustic soda is used.

Q) 'Altitude sickness' is caused at high altitude due to

- A. High partial pressure of oxygen
- B. Low partial pressure of oxygen
- C. Low level of haemoglobin
- D. High partial pressure of carbon dioxide

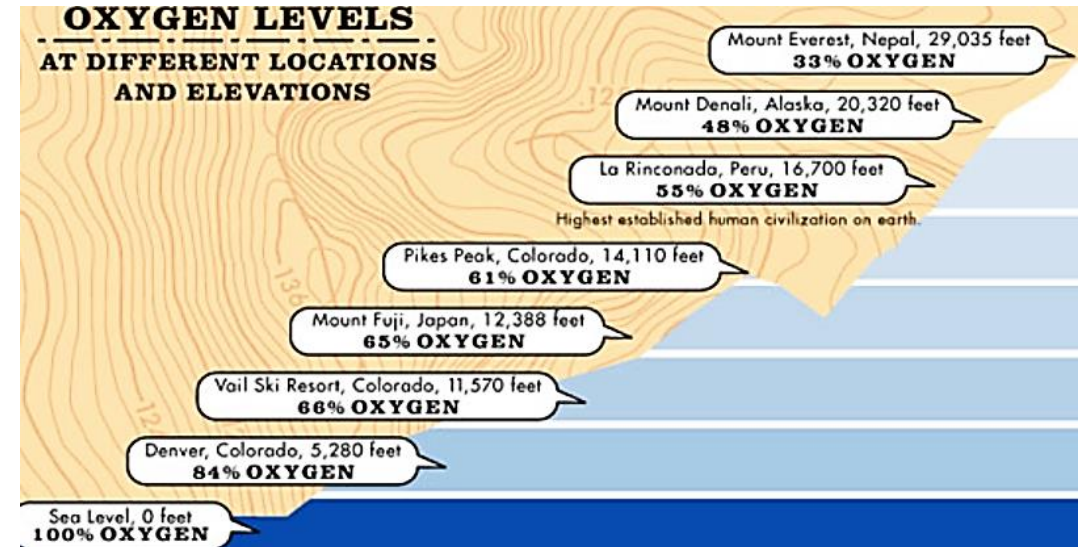
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Altitude sickness is caused by rapid exposure to low amounts of oxygen at high elevation.

Q) The elemental composition of an adult human body by mass is

A. $C > O > H > N$

B. $O > C > H > O$

C. $N > C > H > O$

D. $N > C > O > H$

Q) The elemental composition of an adult human body by mass is

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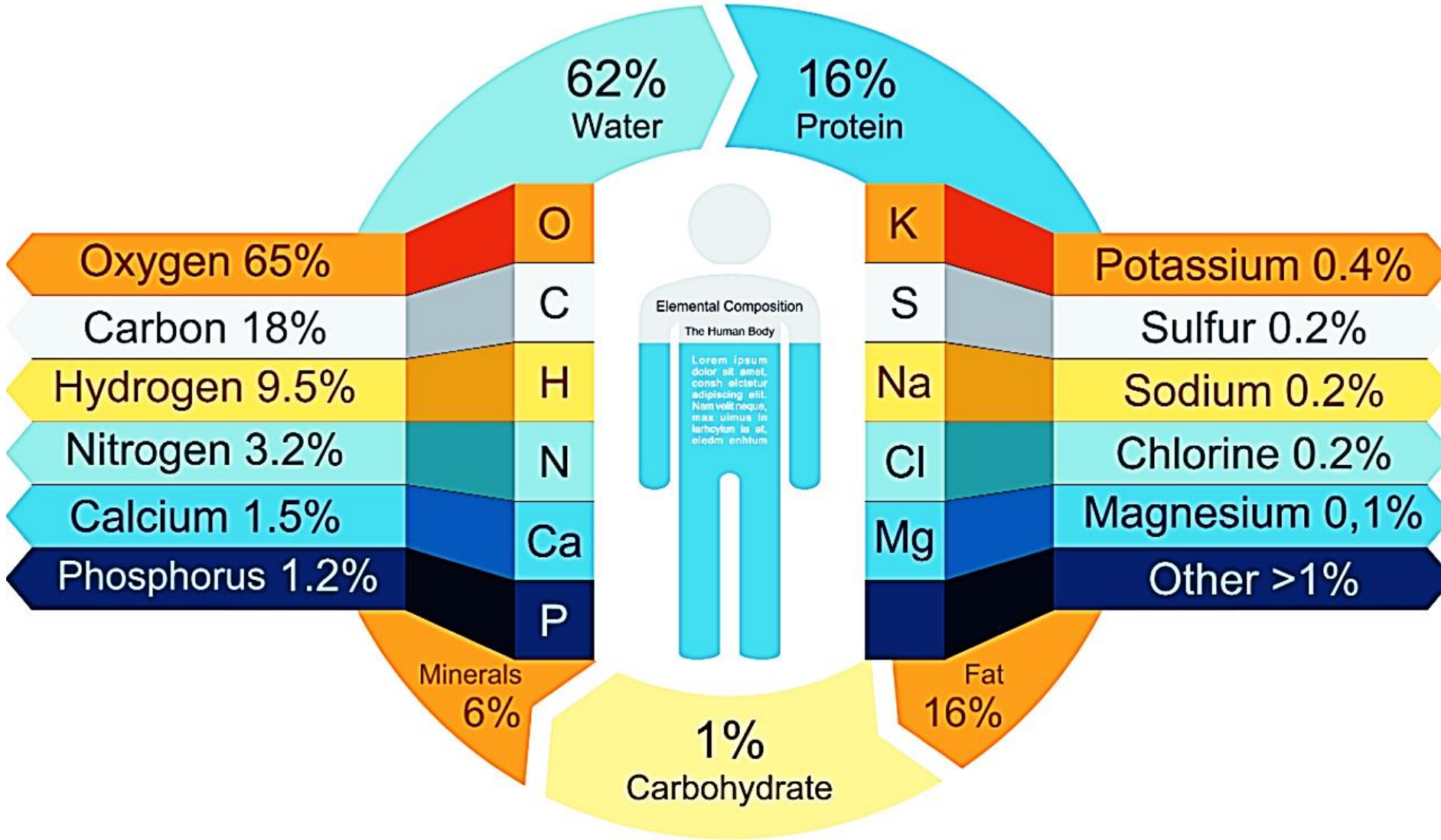
B. $O > C > H > O$

C. $N > C > H > O$

D. $N > C > O > H$

O= 65% C= 18% H= 9.5% N= 3.2% Ca= 1.5%

THE HUMAN BODY



ELEMENTAL COMPOSITION

Q) Methyl Isocyanate gas, which was involved in the disaster in Bhopal in December 1984, was used in the Union Carbide factory for the production of

- A. Dyes
- B. Detergents
- C. Explosives
- D. Pesticides

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Q) Which one of the following is an example of chemical change?

- A. Burning of paper
- B. Magnetisation of soft iron
- C. Dissolution of cane sugar in water
- D. Preparation of ice cubes from water

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Physical Changes



Crushing a can



Melting an ice cube



Boiling water



Mixing sand with water



Breaking glass



Dissolving sugar in water



Shredding paper



Chopping wood



Mixing green and red marbles



Sublimation of dry ice

Chemical Changes



Iron Rusting



Burning Wood



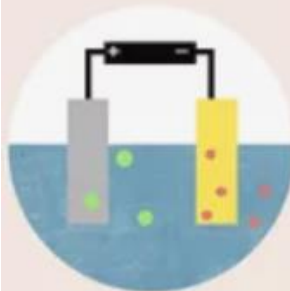
Metabolism



Cooking an Egg



Baking a Cake



Electroplating



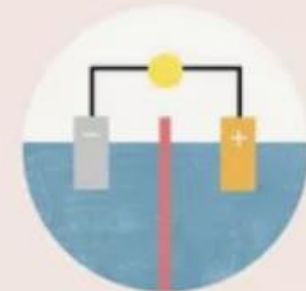
Rotting Banana



Vinegar and Baking
Soda Mixture



Fireworks



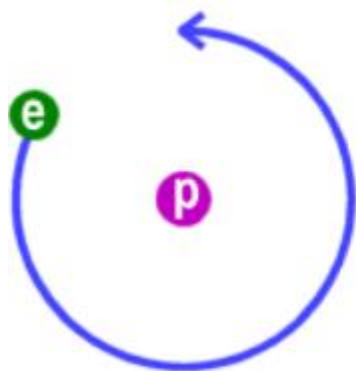
Chemical Battery

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

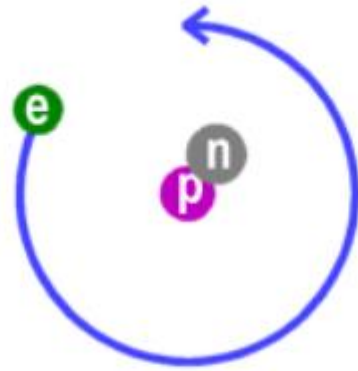
- A. Hydrogen is an element.
- B. Hydrogen is the lightest element.
- C. Hydrogen has no isotopes.
- D. Hydrogen and oxygen form an explosive mixture.

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

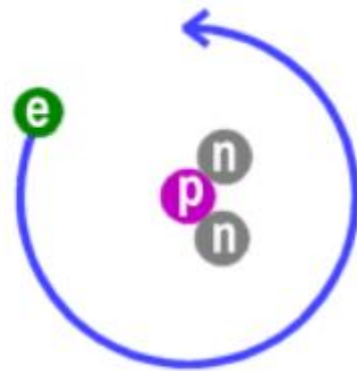
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${}^1\text{H}$
Protium



${}^2\text{H}$
Deuterium



${}^3\text{H}$
Tritium

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

List-I(Exponent)

A. John Dalton

B. Joseph Proust

C. Antoine Lavoisier

D. Joseph Louis Gay-Lussac

List-II(Law)

1. Law of definite proportion by volume

2. Law of multiple proportion

3. Law of definite proportion by weight

4. Law of conservation of mass

Select the correct answer using the code given below.

A B C D

A. 2 3 4 1

B. 2 4 3 1

C. 1 4 3 2

D. 1 3 4 2

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A. 2 3 4 1

B. 2 4 3 1

C. 1 4 3 2

D. 1 3 4 2

Q) Which one of the following is not true for diamond?

- A. Each carbon atom is linked to four other carbon atoms.
- B. Three-dimensional network structure of carbon atoms is formed.
- C. It is used as an abrasive for sharpening hard tools.
- D. It can be used as a lubricant

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- D. It can be used as a lubricant**

Diamond cannot be used as a lubricant



Q) X-rays are

- A. Deflected by an electric field but not by a magnetic field.
- B. Deflected by a magnetic field but not by an electric field.
- C. Deflected by both a magnetic field and an electric field.
- D. Not deflected by an electric field or a magnetic field

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- B. Deflected by a magnetic field but not by an electric field.
- C. Deflected by both a magnetic field and an electric field.
- D. Not deflected by an electric field or a magnetic field.**

X-rays are not deflected by an electric field or a magnetic field because they do not carry any charge. X-rays are a type of radiation called electromagnetic waves. X-ray imaging creates pictures of the inside of your body. The images show the parts of your body in different shades of black and white. This is because different tissues absorb different amounts of radiation.

Q) Which one of the following minerals contains mostly silica?

- A. Mica
- B. Quartz
- C. Olivine
- D. Pyroxene

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Among the given minerals, Quartz mostly contains silica. Though all other given minerals also contain silica, e.g., mica comprises potassium, aluminum, magnesium, iron, silica, etc., olivine contains magnesium, iron and silica, and pyroxene contains calcium, aluminum, magnesium, iron and silica. But, the quantity of silica is the highest in quartz among all the given minerals

Q) Which of the following elements are found in highest and lowest quantities respectively in the crust of the earth?

- A. Oxygen and silicon
- B. Calcium and sodium
- C. Sodium and magnesium
- D. Oxygen and magnesium

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- A. Oxygen and silicon
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- D. Oxygen and magnesium**

S. No.	Elements	By Weight (%)
1.	Oxygen	46.60
2.	Silicon	27.72
3.	Aluminium	8.13
4.	Iron	5.00
5.	Calcium	3.63
6.	Sodium	2.83
7.	Potassium	2.59
8.	Magnesium	2.09
9.	Others	1.41

Oxygen and magnesium elements are found in the highest and lowest quantities, respectively in the crust of the earth

Q) When a piece of pure silicon is doped with aluminium, then

- A. The conductivity of the doped silicon piece will remain the same
- B. The doped silicon piece will become n type
- C. The doped silicon piece will become p type
- D. The resistivity of the doped silicon piece will increase

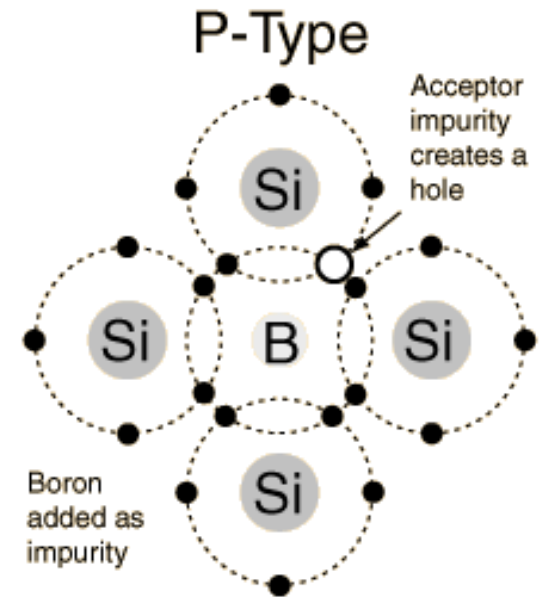
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D. The resistivity of the doped silicon piece will increase



p type of semiconductor is obtained when Silicon is doped with a trivalent impurity like Aluminium

Q) The pH value of a sample of multiple distilled water is

A. Zero

B. 14

C. Very near to zero

D. Very near to seven

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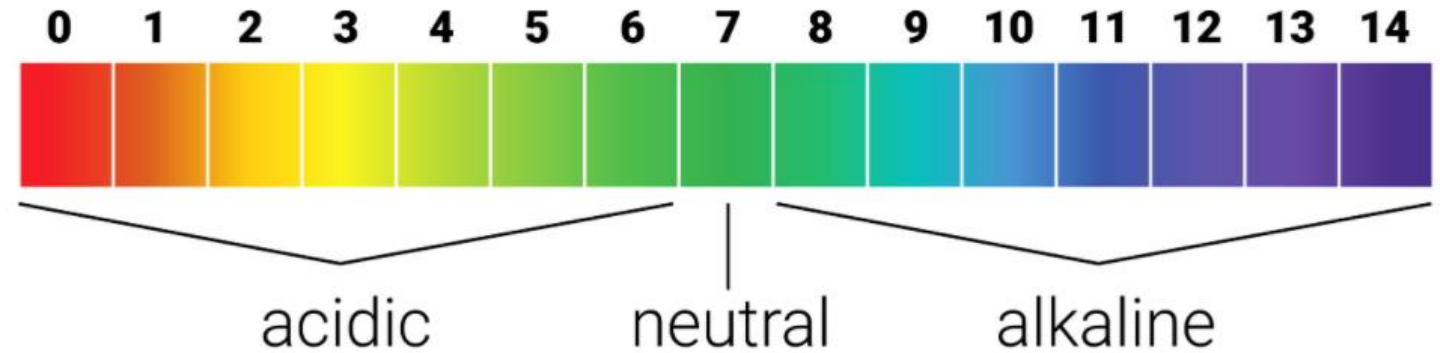
A. Zero

B. 14

C. Very near to zero

D. Very near to seven

The pH scale



Water is neutral and has a pH value of 7 and because here it is multiple distilled water, it would be very near to seven.

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

A. Density

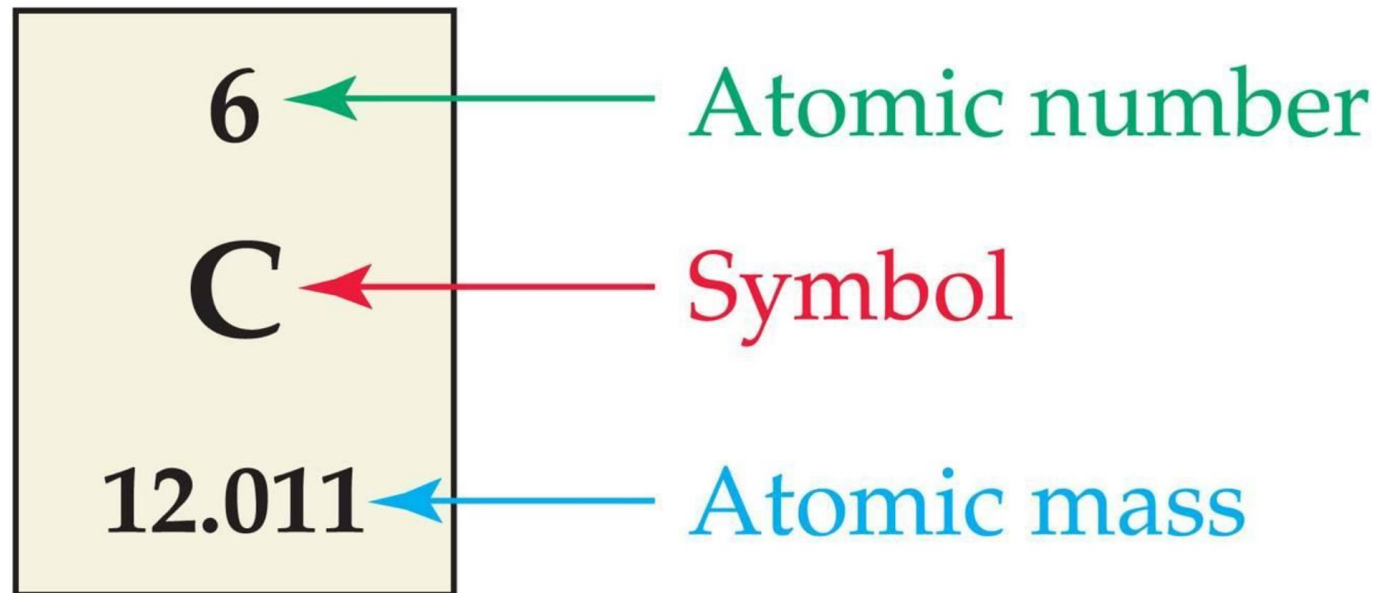
B. Boiling point

C. Mass number

D. Atomic number

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

- A. Density
- B. Boiling point
- C. Mass number
- D. Atomic number**



Atomic number is the fundamental properties of an element. Every atom is identified by its unique atomic number.

Q) There are two elements-calcium (atomic number 20) and argon (atomic number 18). The mass number of both the elements is 40. They are therefore known as

- A. Isotones
- B. Isochores
- C. Isobars
- D. Isotopes

Q) There are two elements-calcium (atomic number 20) and argon (atomic number 18). The mass number of both the elements is 40. They are therefore known as

- A. Isotones
- B. Isochores
- C. Isobars**
- D. Isotopes

Isobars-These are atoms of same mass number but different atomic number

Q) 'Plum Pudding Model' for an atom was proposed by

A. Antoine Lavoisier

B. Robert Boyle

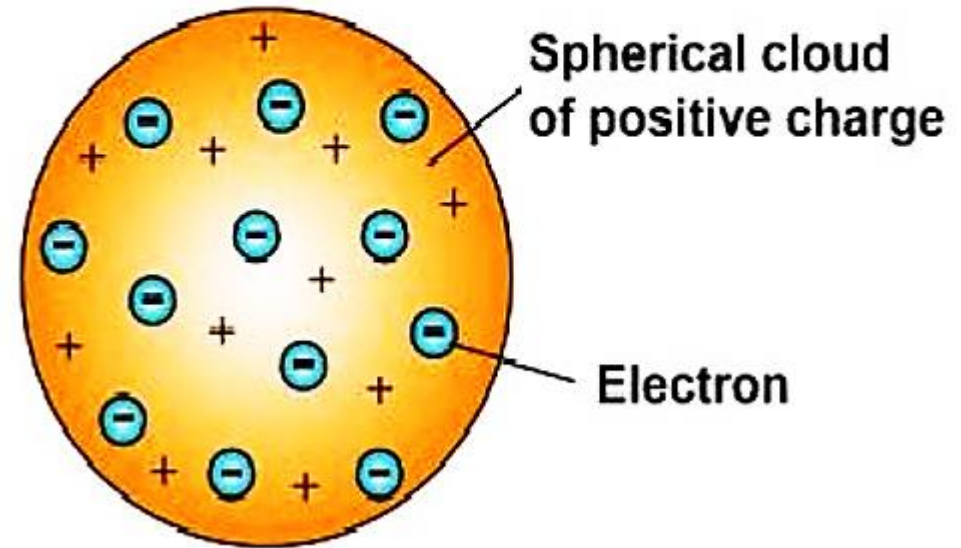
C. Ernest Rutherford

D. J. J. Thomson

Q) 'Plum Pudding Model' for an atom was proposed by

- A. Antoine Lavoisier
- B. Robert Boyle
- C. Ernest Rutherford
- D. J. J. Thomson**

Thomson's Plum pudding model



The first model of atom was proposed by J. J. Thomson in 1898.

Q) What is the number of atoms in 46 g of sodium-23 (N = Avogadro constant)?

A. $N/2$

B. N

C. $2 N$

D. $23 N$

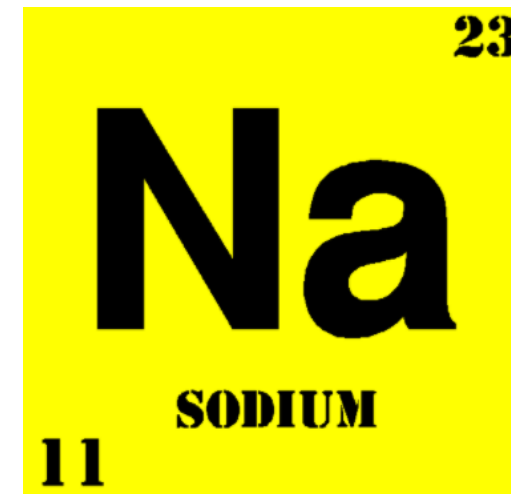
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A. $N/2$

B. N

C. $2N$

D. $23N$



Number of atoms in 46 grams of sodium-23 will be $2N$.

Q) The chemical properties of an element depend upon

- A. The number of isotopes of the element
- B. The mass number of the element
- C. The total number of neutrons in the element
- D. The number of electrons in the outermost shell of the element

Q) The chemical properties of an element depend upon

A. The number of isotopes of the element

B. The mass number of the element

C. The total number of neutrons in the element

D. The number of electrons in the outermost shell of the element

Chemical properties of an element depend on the number and the configuration of their (valence) electrons.

Q) Blue Baby Syndrome is caused by the contamination of

- A. Nitrite
- B. Sulphite
- C. Nitrate
- D. Sulphate

Q) Blue Baby Syndrome is caused by the contamination of

- A. Nitrite
- B. Sulphite
- C. Nitrate**
- D. Sulphate

Excessive nitrates in drinking water can cause the blue baby syndrome.

Blue Baby Syndrome

It's a medical condition in which baby turns out blue due to the presence of deoxygenated haemoglobin in blood.



Q) Pearl is a hard object produced within the soft tissues of a mollusc. Which one of the following is the main constituent of pearl?

- A. Calcium carbonate
- B. Calcium oxide
- C. Calcium nitrate
- D. Calcium sulphate

Q) Pearl is a hard object produced within the soft tissues of a mollusc. Which one of the following is the main constituent of pearl?

A. Calcium carbonate

B. Calcium oxide

C. Calcium nitrate

D. Calcium sulphate



A pearl is a hard substance which is formed by the concentric layer of Calcium carbonate.

Q) The paste of a white material in water is used to maintain a fractured bone fixed in place. The white material used is called

- A. Bleaching powder
- B. Plaster of Paris
- C. Powder of zinc oxide
- D. Lime powder

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- A. Bleaching powder
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- C. Powder of zinc oxide
- D. Lime powder



Also called P.O.P is made by heating gypsum

Q) What are the main constituents of biogas?

- A. Methane and sulphur dioxide
- B. Methane and carbon dioxide
- C. Methane, hydrogen and nitric oxide
- D. Methane and nitric oxide

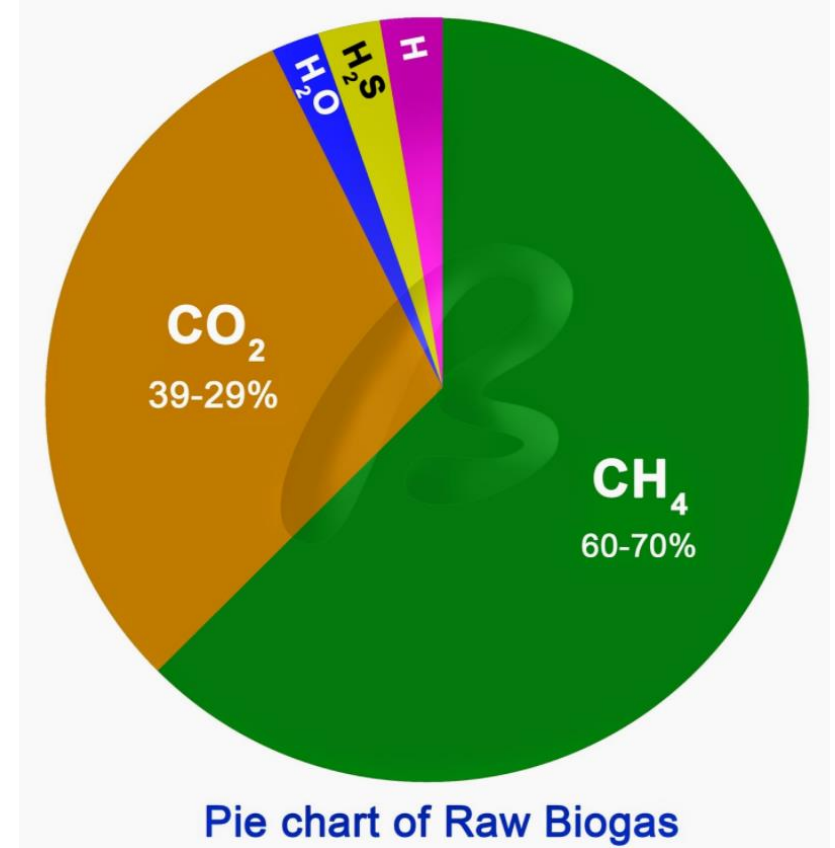
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A. Methane and sulphur dioxide

B. Methane and carbon dioxide

C. Methane, hydrogen and nitric oxide

D. Methane and nitric oxide



Biogas is an environmental friendly fuel; produced by anaerobic action of microorganism that feeds on animal and agricultural waste. It is a renewable source of energy.

Q) One carbon credit is accepted as equivalent to

- A. 100 kg of carbon
- B. 100 kg of carbon dioxide
- C. 1000 kg of carbon
- D. 1000 kg of carbon dioxide

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- A. 100 kg of carbon
- B. 100 kg of carbon dioxide
- C. 1000 kg of carbon
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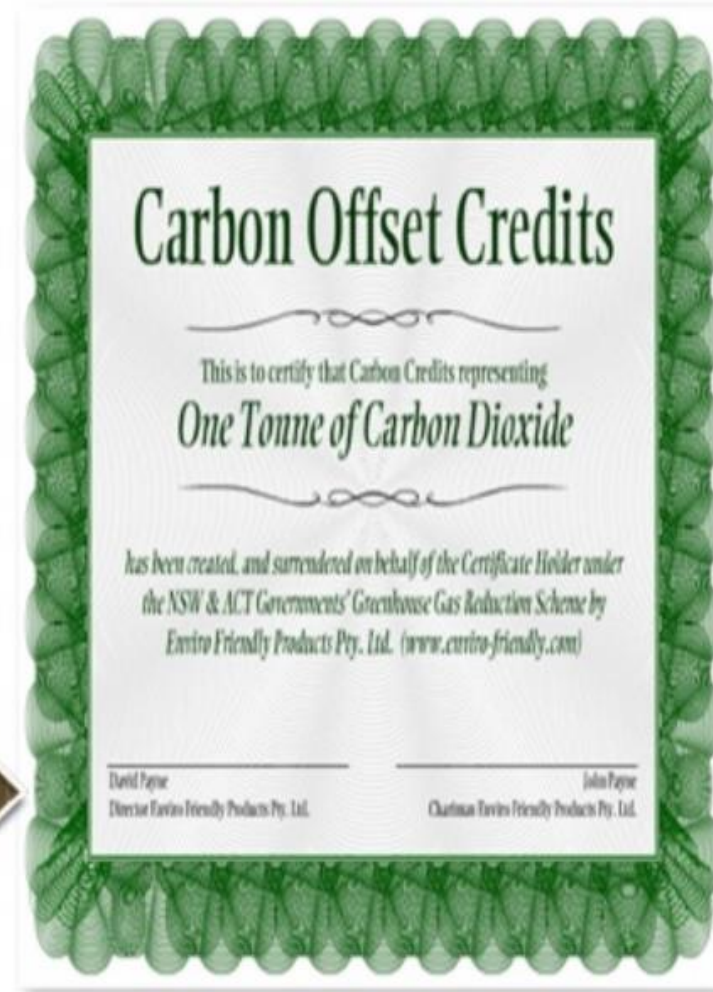
One ton (1,000 kg) of carbon dioxide is equal to one carbon credit.

Carbon credit is a tradable certificate that permits to emit carbon dioxide or any other greenhouse gases equal to one carbon credit.

What is **Carbon Credit** under the **KYOTO** Protocol...

A credit for reducing 1 ton of CO₂ (Green House Gases) from the atmosphere

Allowance to generate 1 tonne of CO₂ (GHG's)



Q) An emulsion consists of

- A. One liquid and one solid
- B. One liquid and one gas
- C. Two liquids
- D. Two solids

Q) An emulsion consists of

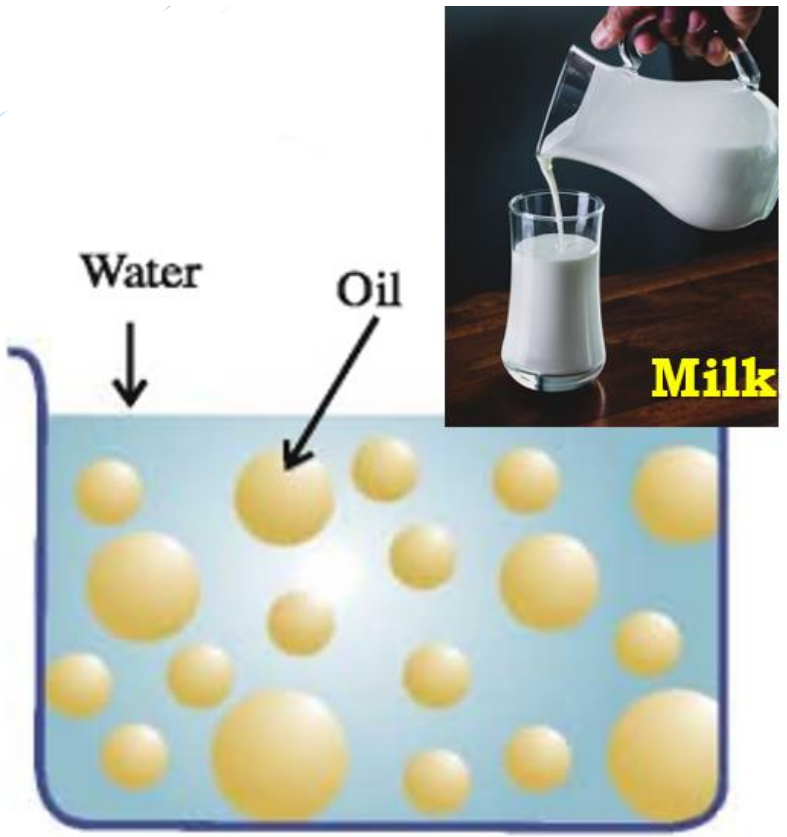
A. One liquid and one solid

B. One liquid and one gas

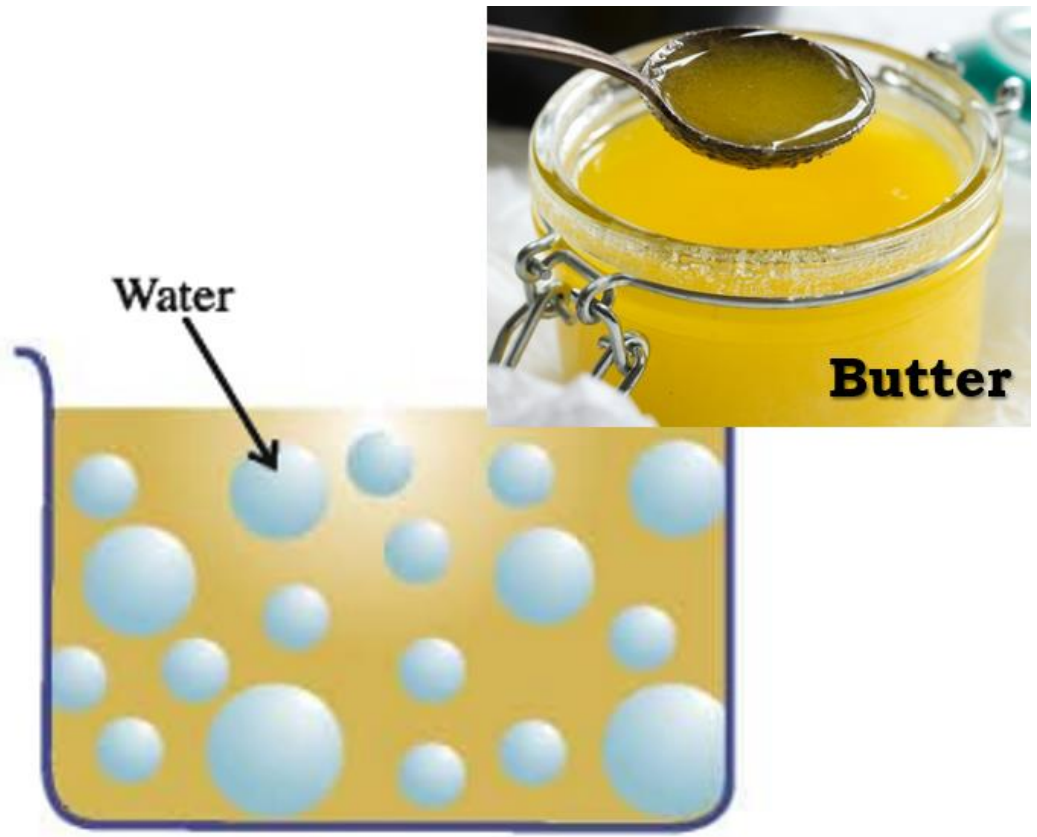
C. Two liquids

D. Two solids

Emulsion is a mixture of two or more immiscible liquids. Milk, mayonnaise, lemonade are few examples of emulsions



Oil in water



Water in oil

Q) Desalination of seawater is done by using reverse osmosis. The pressure applied to the solution is

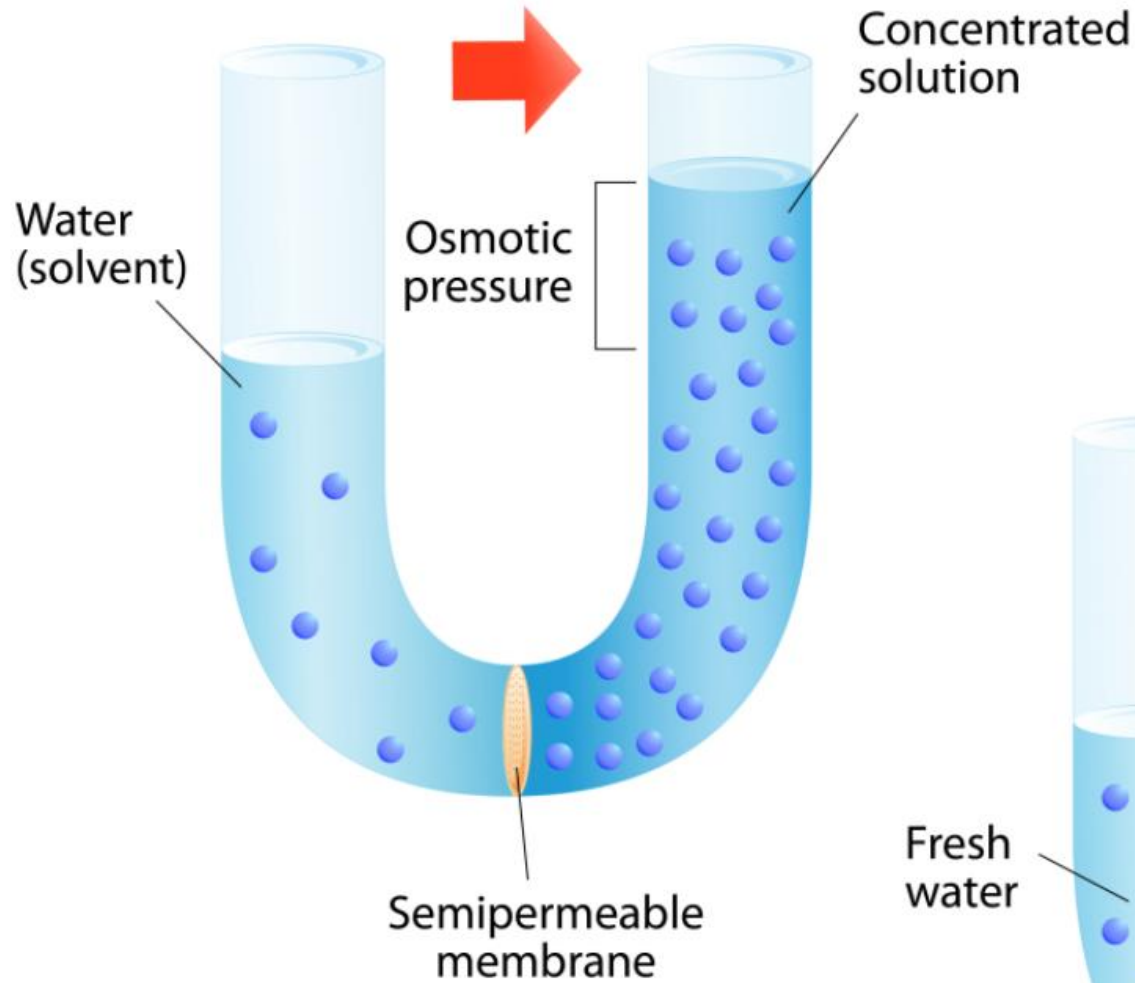
- A. Larger than osmotic pressure
- B. Smaller than osmotic pressure
- C. Equal to osmotic pressure
- D. Equal to atmospheric pressure

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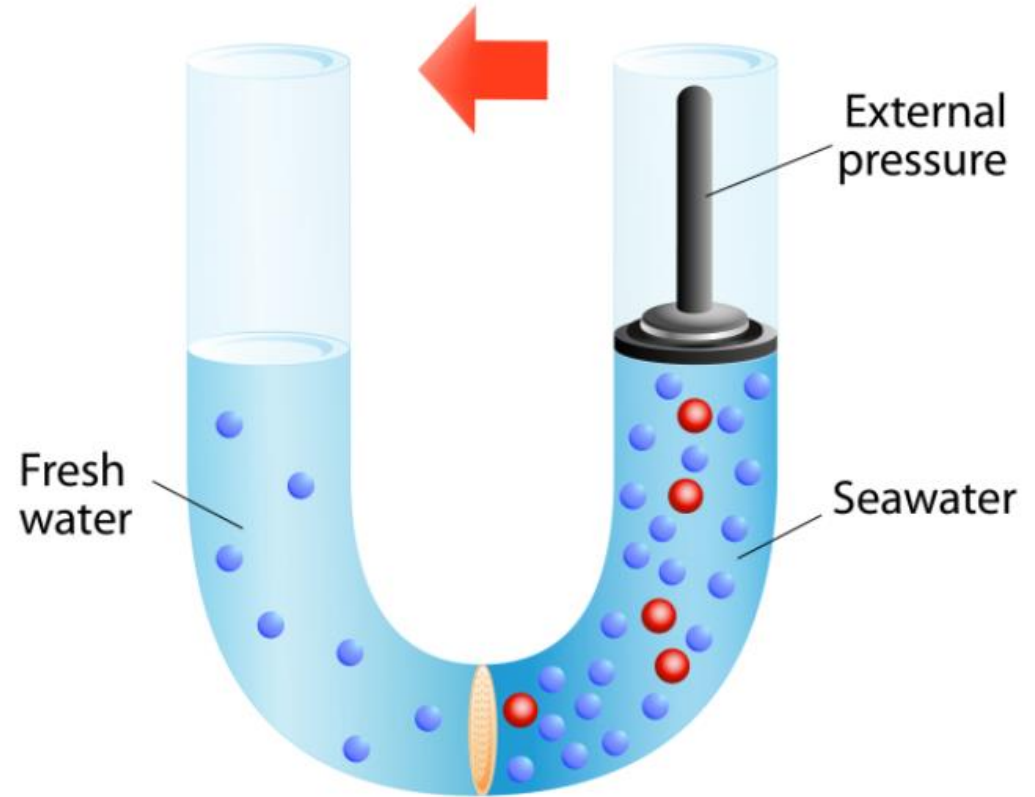
- A. Larger than osmotic pressure**
- B. Smaller than osmotic pressure
- C. Equal to osmotic pressure
- D. Equal to atmospheric pressure

For desalination of seawater pressure ranges from 800- 1000 psi.

Osmosis



Reverse osmosis







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Q) Which one of the following polymers does not contain glucose units?

A. Glycogen

B. Starch

C. Cellulose

D. Rubber

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- A. Glycogen
- B. Starch
- C. Cellulose
- D. Rubber**



Rubber consists of polymers of the organic compound called isoprene.

Q) Tincture of iodine is an antiseptic for fresh wounds. It is a dilute solution of elemental iodine, which does not contain

A. Water

B. Acetone

C. Alcohol

D. Potassium iodine

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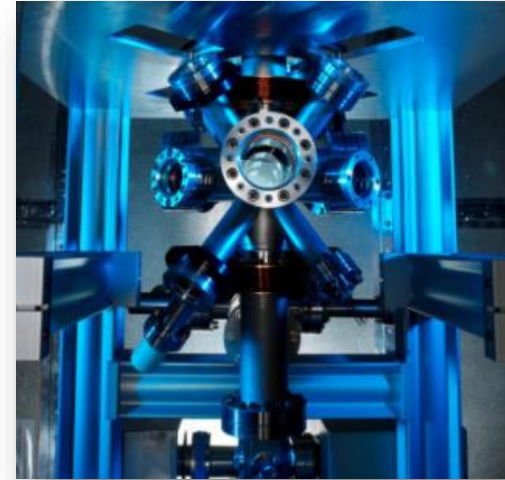
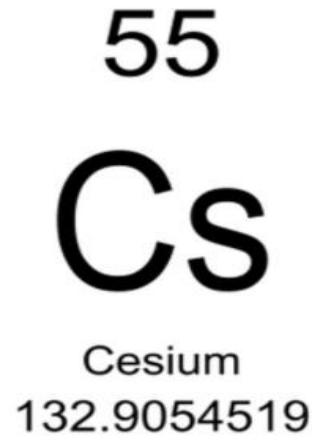
Tincture of iodine is an antiseptic solution. It contains 2% iodine, 47% alcohol and 2.4% potassium iodine

Q) Which one of the following elements is used as a timekeeper in atomic clocks?

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

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- C. Calcium
- D. Magnesium



Atomic Clocks

When exposed to certain frequencies of radiation, such as radio waves, the subatomic particles called electrons that orbit an atom's nucleus will "jump" back and forth between energy states. Clocks based on this jumping within atoms can therefore provide an extremely precise way to count seconds

Q) Which one of the following gases dissolves in water to give acidic solution?

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

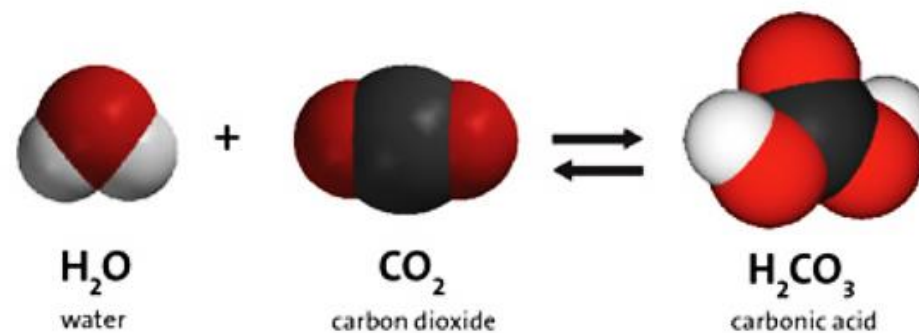
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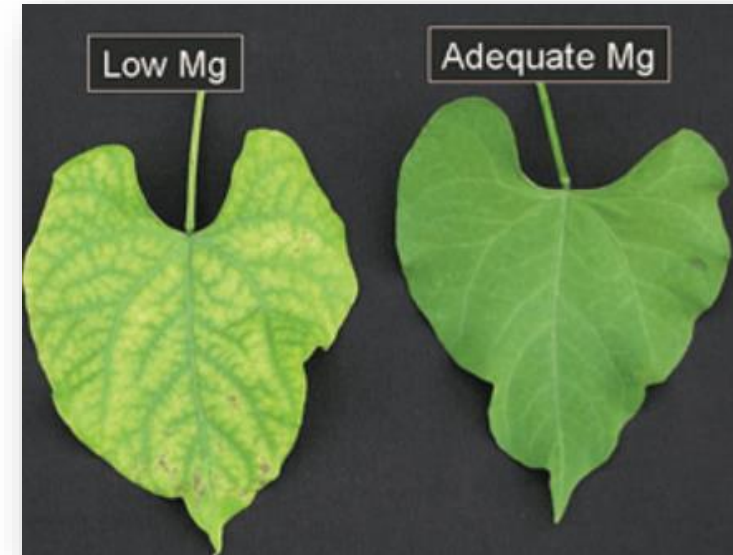
Carbon dioxide (CO₂) gas dissolved in water can cause water to become acidic.

Q) Which one of the following elements is essential for the formation of chlorophyll in green plants?

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

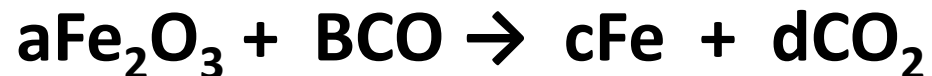
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- D. Potassium



Mg is mobile, so symptoms occur first in old leaves;
A whitish or yellowish striping effect on grasses.

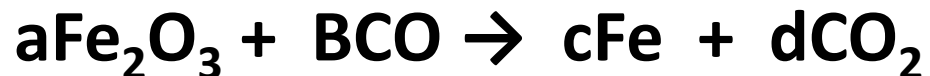
Q) Consider the following chemical reaction :



In the balanced chemical equation of the above, which of the following will be the values of the coefficients a, b, c and d respectively?

- A. 3, 2, 3, 1
- B. 1, 3, 2, 3
- C. 2, 3, 3, 1
- D. 3, 3, 2, 1

Q) Consider the following chemical reaction :



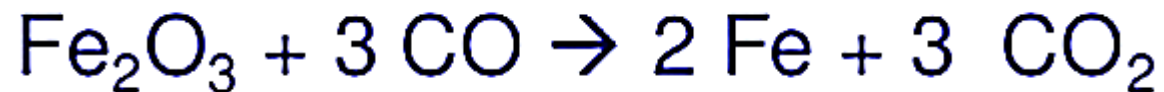
In the balanced chemical equation of the above, which of the following will be the values of the coefficients a, b, c and d respectively?

A. 1, 2, 3, 1

B. 1, 3, 2, 3

C. 2, 3, 3, 1

D. 3, 3, 2, 1



In this reaction, the iron oxide is reduced to iron, and the carbon is oxidized to carbon dioxide.

Q) Which one of the following is the correct relation between the Kelvin temperature (T) and the Celsius temperature (T_c)?

A. These are two independent temperature scales

B. $T = T_c$

C. $T = T_c - 273.15$

D. $T = T_c + 273.15$

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$$^{\circ}\text{Fahrenheit} = \left[\frac{9}{5} \times ^{\circ}\text{C} \right] + 32$$

$$^{\circ}\text{Celsius} = \left[^{\circ}\text{F} - 32 \right] \times \frac{5}{9}$$

$$^{\circ}\text{Kelvin} = ^{\circ}\text{C} + 273.15$$

Q) Bright light is found to emit from photographer's flashgun. This brightness is due to the presence of which one of the following noble gases?

- A. Argon
- B. Xenon
- C. Neon
- D. Helium

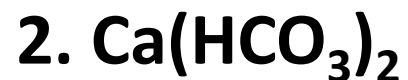
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- B. Xenon**
- C. Neon
- D. Helium



Brilliant incandescent by discharging a current for a brief instant is produced through Xenon.

Q) Which of the following substances cause temporary hardness in water?



Select the correct answer using the code given below.

A. 3 and 4

B. 2 and 3

C. 1 and 4

D. 1 and 2

Q) Which of the following substances cause temporary hardness in water?



Select the correct answer using the code given below.

A. 3 and 4

B. 2 and 3

C. 1 and 4

D. 1 and 2

Q) Which one of the following elements will be an isobar of calcium if the atomic number of calcium is 20 and its mass is 40?

- A. Element with 20 protons and 18 neutrons
- B. Element with 18 protons and 19 neutrons
- C. Element with 20 protons and 19 neutrons
- D. Element with 18 protons and 22 neutrons

Q) Which one of the following elements will be an isobar of calcium if the atomic number of calcium is 20 and its mass is 40?

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- C. Element with 20 protons and 19 neutrons
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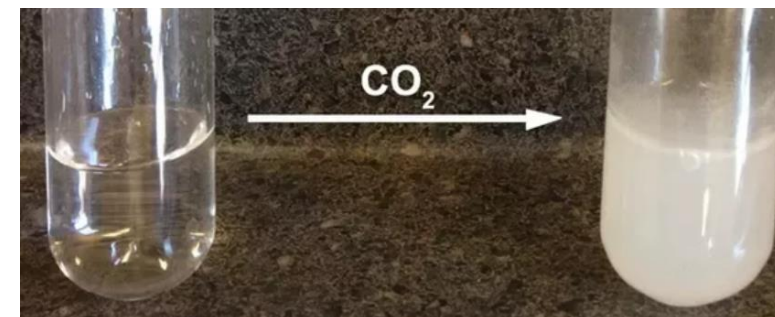
Isobars have same Mass No. but different Atomic No.

Q) Two reactants in a flask at room temperature are producing bubbles of a gas that turn limewater milky. The reactants could be

- A. Zinc and hydrochloric acid
- B. Magnesium carbonate and hydrochloric acid
- C. Methane and oxygen
- D. Copper and dilute hydrochloric acid

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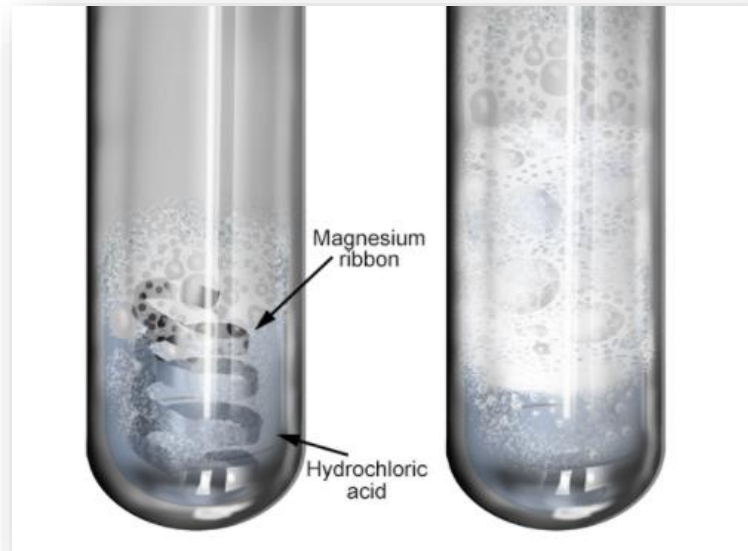
The reaction involved in the question is: $\text{MgCO}_3 + \text{HCl} = \text{MgCl}_2 + \text{H}_2\text{O} + \text{CO}_2$
Since CO_2 is produced in the reaction, it turns lime water milky

Q) Reaction between which of the following two reactants will produce hydrogen gas?

- A. Magnesium and hydrochloric acid
- B. Copper and dilute nitric acid
- C. Calcium carbonate and hydrochloric acid
- D. Zinc and nitric acid

Q) Reaction between which of the following two reactants will produce hydrogen gas?

- A. Magnesium and hydrochloric acid**
- B. Copper and dilute nitric acid
- C. Calcium carbonate and hydrochloric acid
- D. Zinc and nitric acid



Reaction of metals with acid yield hydrogen gas. Reaction involved is:



Q) Which of the following characteristics is common to hydrogen, nitrogen, oxygen and carbon dioxide?

- A. They are all diatomic
- B. They are all gases at room temperature.
- C. They are all coloured.
- D. They all have same reactivity

Q) Which of the following characteristics is common to hydrogen, nitrogen, oxygen and carbon dioxide?

A. They are all diatomic

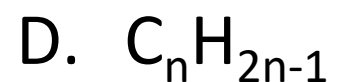
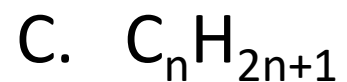
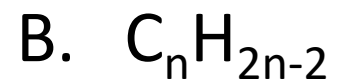
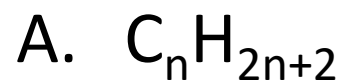
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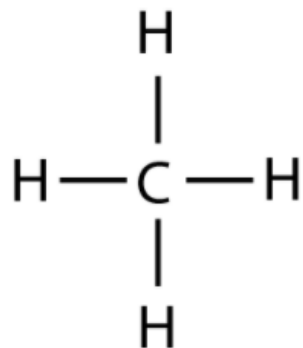
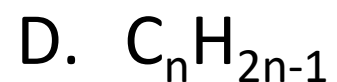
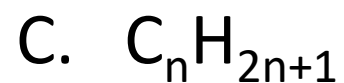
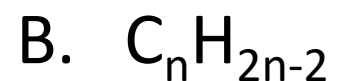
D. They all have same reactivity

All exist as gases at room temperature. All except carbon dioxide are diatomic. None of the given gases is coloured.

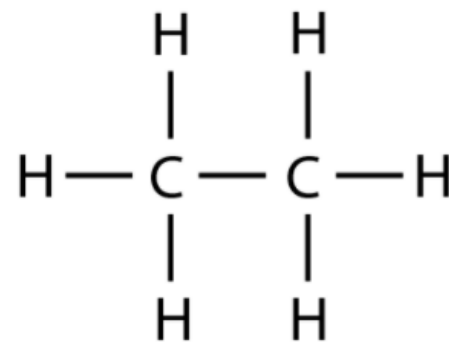
Q) Which of the following is the general formula for saturated hydrocarbons?



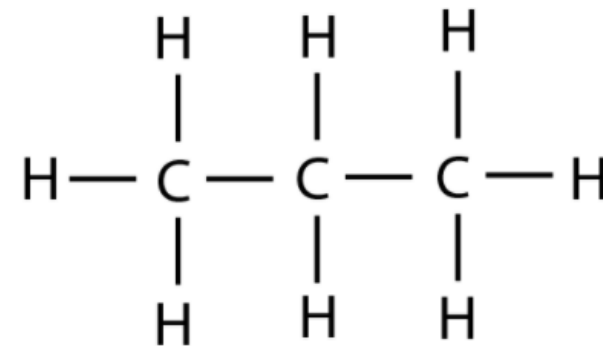
Q) Which of the following is the general formula for saturated hydrocarbons?



Methane



Ethane



Propane

Saturated hydrocarbons are the hydrocarbons with no double or triple bonds.

Q) The equivalent weight of $\text{Ba}(\text{OH})_2$ is given, atomic weight of Ba is 137.3

- A. 85.7
- B. 137.3
- C. 154.3
- D. 171.3

Q) The equivalent weight of Ba(OH)_2 is given, atomic weight of Ba is 137.3

A. 85.7

B. 137.3

C. 154.3

D. 171.3

Molecular mass of $\text{Ba(OH)}_2 = 137.3 + 32 + 2 = 171.3$;

Mole factor = 2;

Equivalent weight = $171.5/2 = 85.7$

Q) Which one of the following nitrogen oxides has the highest oxidation state of nitrogen?

A. NO

B. NO₂

C. N₂O

D. N₂O₅

Q) Which one of the following nitrogen oxides has the highest oxidation state of nitrogen?

A. NO

B. NO₂

C. N₂O

D. N₂O₅

Oxidation state of nitrogen in NO, NO₂, N₂O and N₂O₅ are +2, +4, +1 and +5 respectively. So, N₂O₅ has highest oxidation state of nitrogen

Q) In which of the following, functional group isomerism is not possible?

A. Alcohols

B. Aldehydes

C. Alkyl halides

D. Cyanides

Q) In which of the following, functional group isomerism is not possible?

A. Alcohols

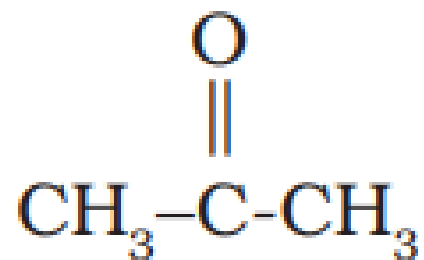
B. Aldehydes

C. Alkyl halides

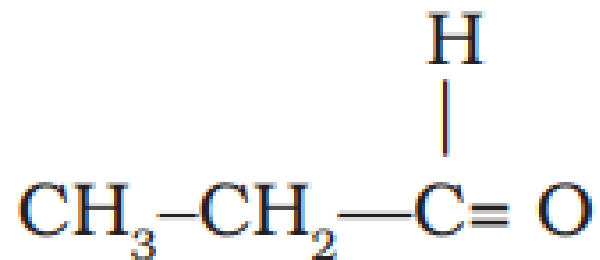
D. Cyanides

The haloalkanes (also known as halogenoalkanes or alkyl halides) are a group of chemical compounds derived from alkanes containing one or more halogens. Halogens can't form more than one bond in the context of common organic compounds and can't form multiple bonds to carbon.

Functional group isomerism:



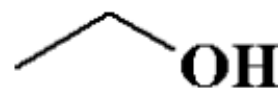
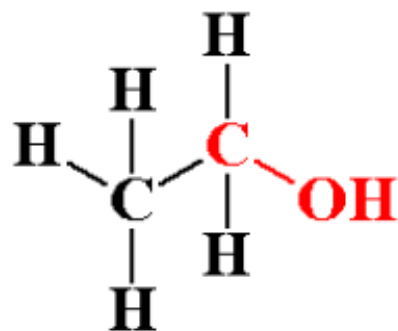
Propanone



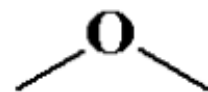
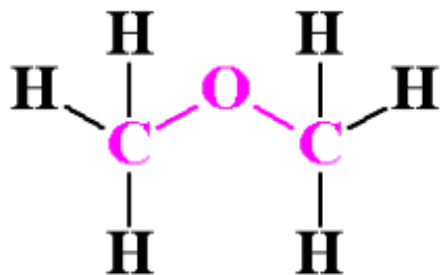
Propanal



**ETHYL
ALCOHOL**



**DIMETHYL
ETHER**



Q) The monomer/monomers used for the synthesis of Nylon 6 is /are

A. Hexamethylenediamine and adipic acid

B. Caprolactam

C. Urea and formaldehyde

D. Phenol and formaldehyde

Q) The monomer/monomers used for the synthesis of Nylon 6 is /are

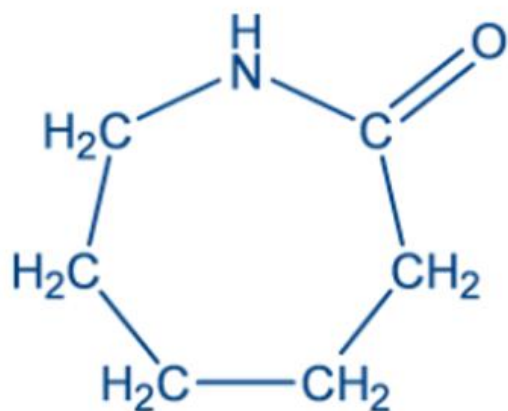
A. Hexamethylenediamine and adipic acid

B. Caprolactam

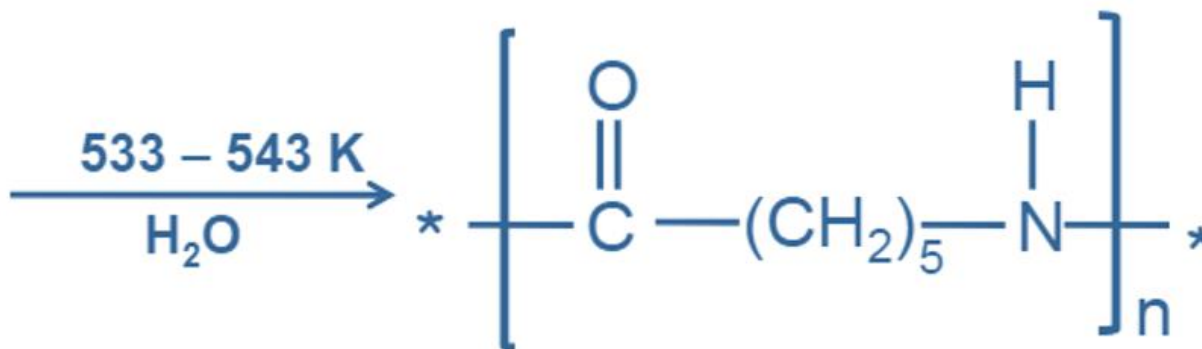
C. Urea and formaldehyde

D. Phenol and formaldehyde

Nylon-6



Caprolactum



Nylon 6

- Obtained by heating *caprolactum* with water at a high temperature
- Used for the manufacturing of tyre cords, fabrics, etc.

Q) When hot water is placed into an empty water bottle, the bottle keeps its shape and does not soften. What type of plastic is the water bottle made from?

- A. Thermoplastic
- B. PVC
- C. Polyurethane
- D. Thermosetting

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Plug



Switches



Sockets



Handles

Thermosetting Plastic cannot be soften on heating or hardened on cooling.

Q) The PCl_5 molecule has trigonal bipyramidal structure. Therefore, the hybridization of p orbitals should be

A. sp^2

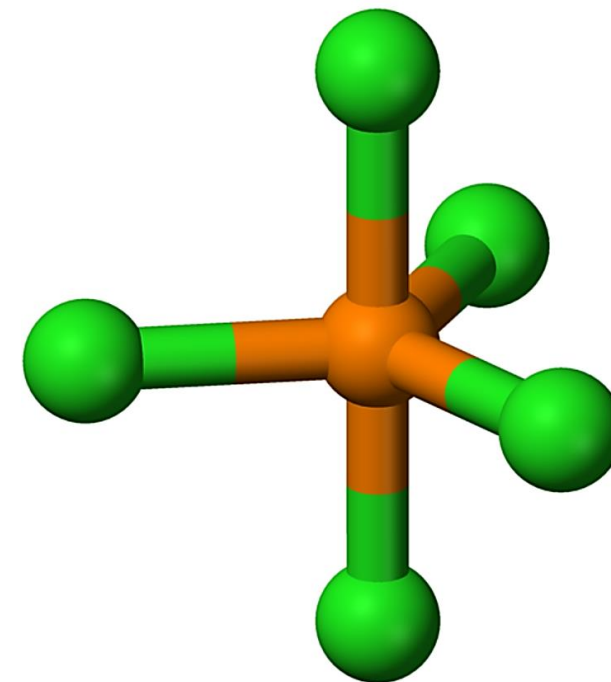
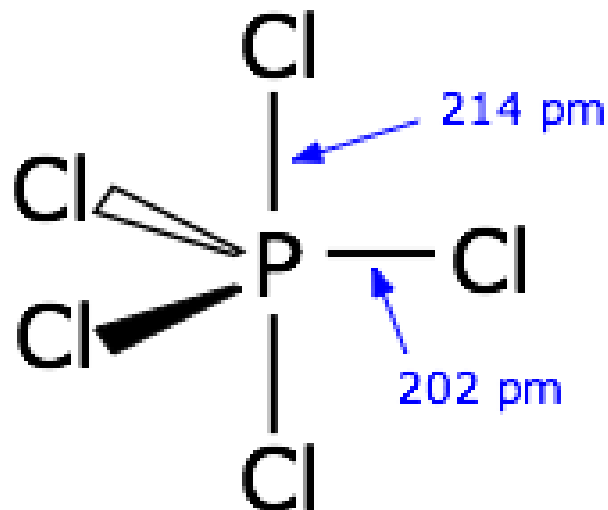
B. sp^3

C. dsp^2

D. dsp^3

Q) The PCl_5 molecule has trigonal bipyramidal structure. Therefore, the hybridization of p orbitals should be

- A. sp^2
- B. sp^3
- C. dsp^2
- D. dsp^3**



PCl_5 has dsp^3 hybridization.

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

List - I

(Compound/Molecule)

- A. CH_3F
- B. HCHO
- C. HCN
- D. NH_3

List - II

(Shape of Molecule)

- 1. Trigonal planar
- 2. Tetrahedral
- 3. Trigonal pyramidal
- 4. Linear

Code :

A B C D

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

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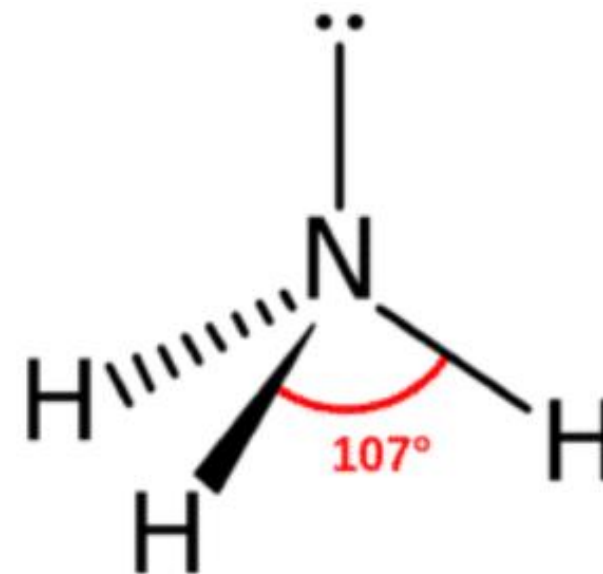
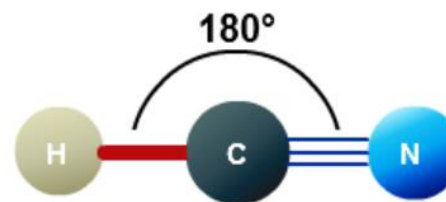
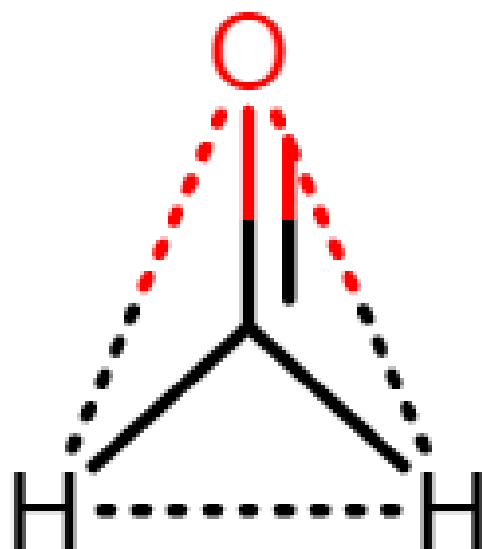
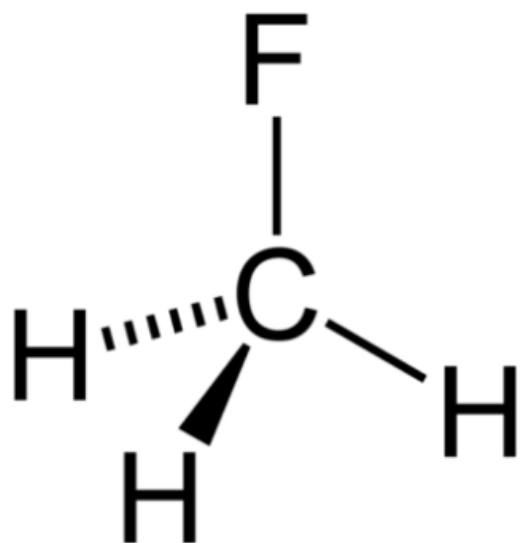
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Code :

A B C D

- A. 2 4 1 3
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CH₃F: Tetrahedral
 HCHO: Trigonal planar
 HCN: Linear
 NH₃ : Trigonal pyramidal



Q) Which one of the following is Monoatomic?

A. Hydrogen

B. Sulphur

C. Phosphorous

D. Helium

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A. Hydrogen

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Helium is Monoatomic

TYPE OF MOLECULES

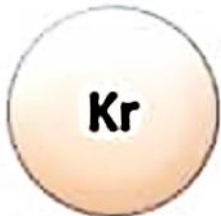
Monoatomic Molecules



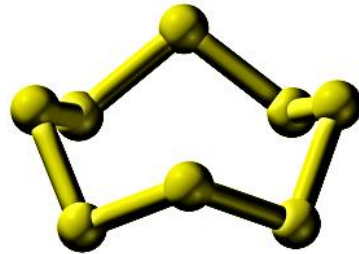
Helium Gas



Lithium Gas



Krypton Gas



Sulphur Gas

Diatomic Molecules



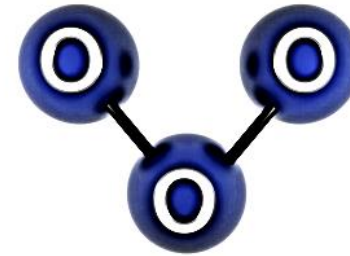
Hydrogen Gas



Oxygen Gas



Chlorine Gas

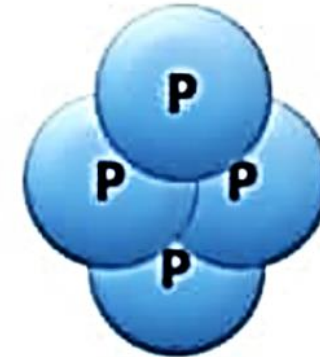


Ozone Gas

Polyatomic Molecules



Water



Phosphorous

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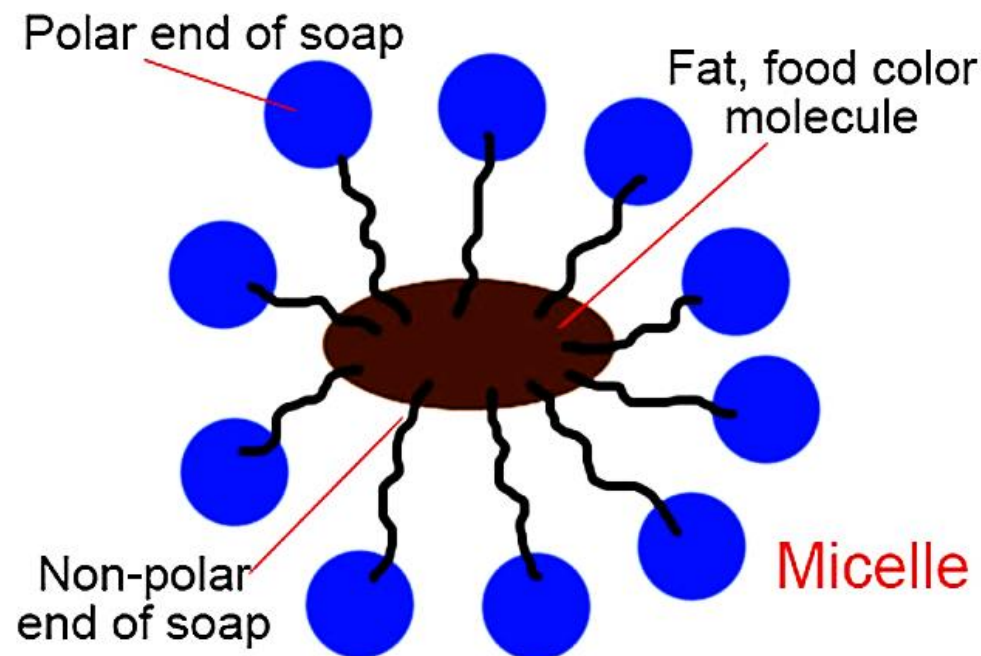


Q) Soap solution used for cleaning purpose appears cloudy due to the fact that soap micelles can

- A. Refract light
- B. Scatter light
- C. Diffract light
- D. Polarize light

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Soap solution is a colloidal solution. A soap solution appears cloudy because the soap micelles are large enough to scatter light.

Q) People prefer to wear cotton clothes in summer season due to the fact that cotton clothes are

- A. Good absorbers of water
- B. Good conveyors of heat
- C. Good radiators of heat
- D. Good absorbers of heat

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We sweat more in the summer session. Cotton is a strong water absorber helps to absorb the sweat and introduce to the environment of evaporation. Our body takes out heat as the sweat evaporates from our body.

Q) Consider the following statement:

"Atomic number of an element is a more fundamental property than its atomic mass." Who among the following scientists has made the above statement?

- A. Dmitri Mendeleev
- B. Henry Moseley
- C. J.J. Thomson
- D. Ernest Rutherford

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Q) Rate of evaporation increases with-

- A. An increase of surface area
- B. An increase in humidity
- C. A decrease in wind speed
- D. A decrease of temperature

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- A. Temperature
- B. Its surface area exposed to the atmosphere
- C. Its mass
- D. Humidity

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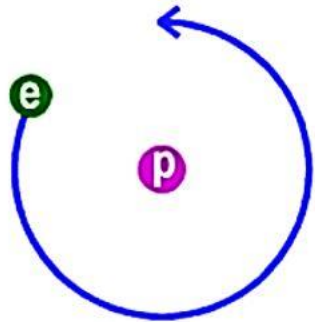
Q) Which one of the following statements is not correct?

- A. Elements are defined by the number of protons they possess
- B. Isobars are atoms having the same atomic number but different mass number
- C. The mass number of an atom is equal to the number of nucleons in its nucleus
- D. Valency is the combining capacity of an atom

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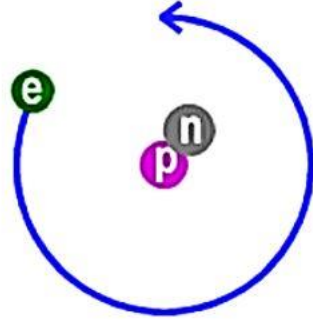
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Isotope



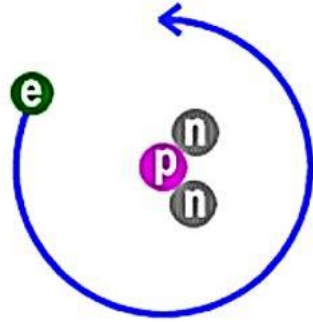
${}^1\text{H}$

Protium



${}^2\text{H}$

Deuterium



${}^3\text{H}$

Tritium

Isotone

Oxygen ${}^{16}_8\text{O}$ (p=8; n=8)

Nitrogen ${}^{15}_7\text{N}$ (p=7; n=8)

Carbon ${}^{14}_6\text{C}$ (p=6; n=8)

Isobar

${}^{40}_{18}\text{Ar}$

${}^{40}_{19}\text{K}$

Q) Bose-Einstein Condensate is

- A. Solid state of matter
- B. Fifth state of matter
- C. Plasma
- D. State of condensed matter

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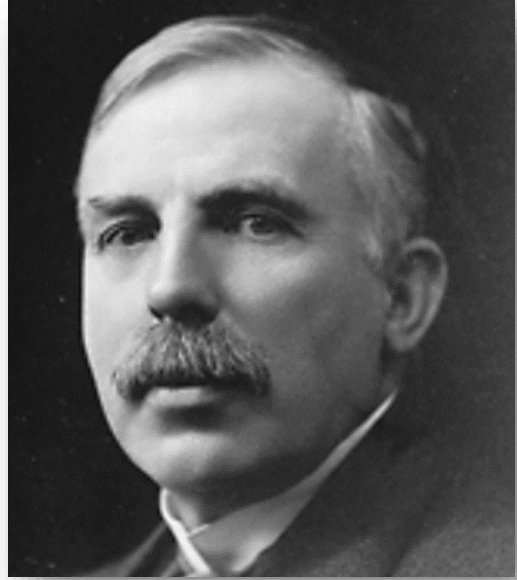
The state of matter of a dilute gas of bosons which is cooled to temperatures very close to absolute zero

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

- A. Electron
- B. Proton
- C. Atomic nucleus
- D. Neutron

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- D. Neutron



In the now well-known experiment, alpha particles were observed to scatter backwards from a gold foil. Rutherford's explanation, which he published in May 1911, was that the scattering was caused by a hard, dense core at the center of the atom—the nucleus

Q) Silver articles become black after some time when exposed to air because

- A. Silver gets oxidized to silver oxide
- B. Silver reacts with moist carbon dioxide in the air to form silver carbonate
- C. Silver reacts with sulphur in the air to form a coating of silver sulphide
- D. Silver reacts with nitrogen oxides in the air to form silver nitrate

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Q) The number of water molecules associated with copper sulphate molecule to form crystals is

- A. 2
- B. 4
- C. 5
- D. 6

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- A. 2
- B. 4
- C. 5**
- D. 6



The copper sulphate crystals contains 5 molecules of water of crystallization. $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ which are blue in colour

Q) Mahatma Gandhi's Dandi March, a great event in India freedom struggle, was associated with

- A. Iron
- B. Sodium chloride
- C. Sulphur
- D. Aluminum

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A. Iron

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Mahatma Gandhi's Dandi March, a great event in India freedom struggle, was associated with Sodium chloride. The Salt March also called as the Salt Satyagraha, Dandi March and the Dandi Satyagraha, was an act of non-violent civil disobedience in colonial India led by Mahatma Gandhi

Q) Which one of the following is not a property of the X-rays?

- A. They are deflected by electric fields.
- B. They are not deflected by magnetic fields.
- C. They have high penetration length in matter.
- D. Their wavelength is much smaller than that of visible light

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X-rays aren't deflected by electric and magnetic fields because x-rays do not carry and charge. They are electro-magnetic radiations and therefore cannot be deflected by electronic or any magnetic fields

Q) Which one of the following acids is produced in human stomach?

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

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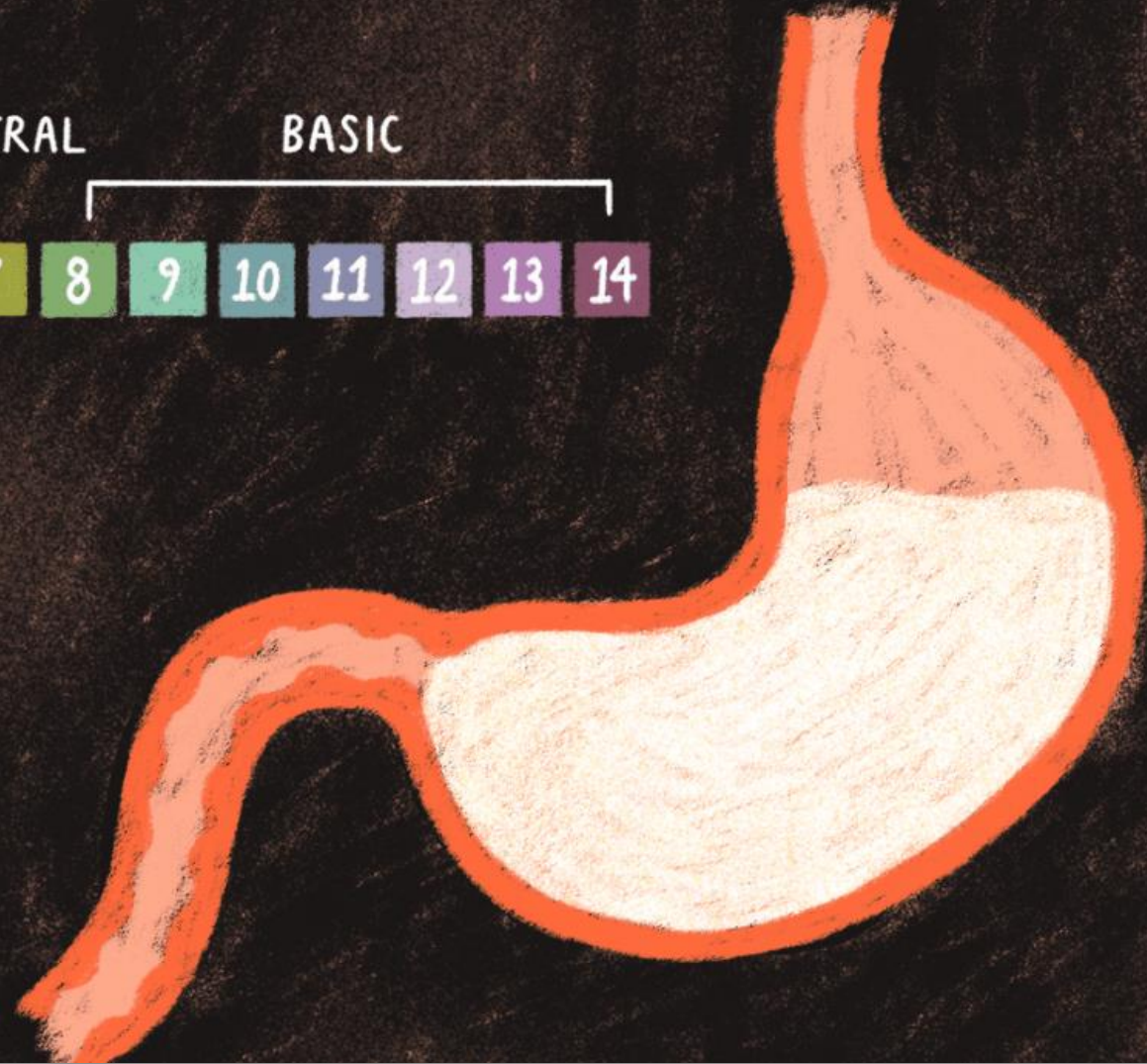


Hydrochloric acid is present in our stomach which helps in digestion.

The pH Levels of the Stomach



- The stomach's resting pH level is about 4 or 5.
- After a high-protein meal, the stomach's pH level may drop to 1 or 2.

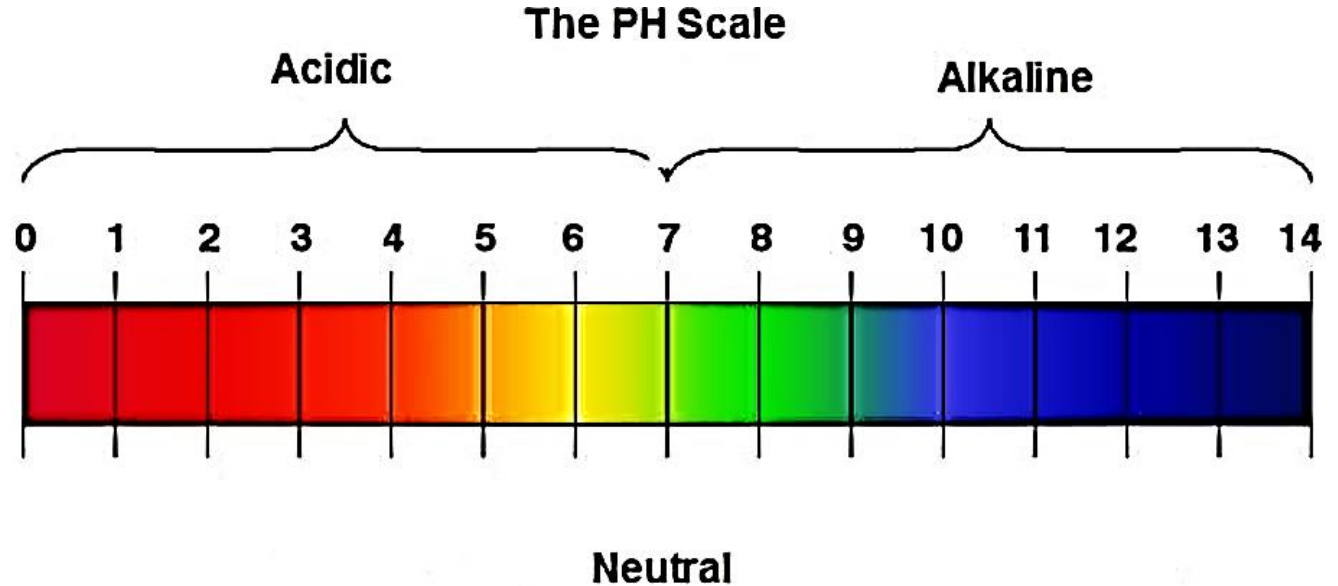


Q) A solution having pH equal to zero is known as

- A. Highly alkaline solution
- B. Highly acidic solution
- C. Weakly acidic solution
- D. Neutral solution

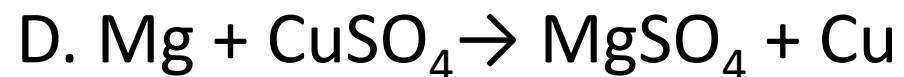
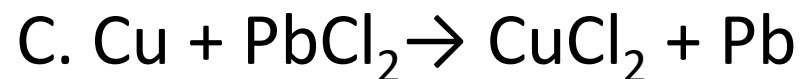
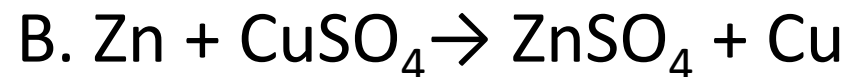
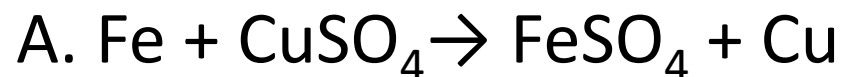
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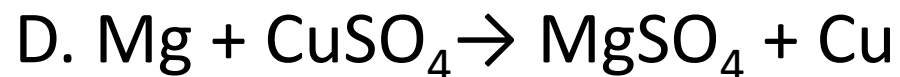
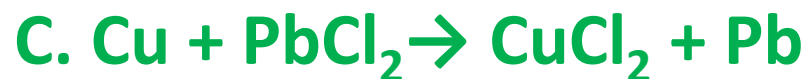
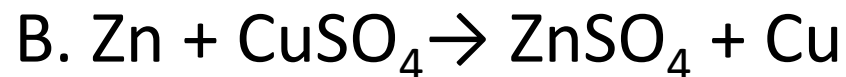
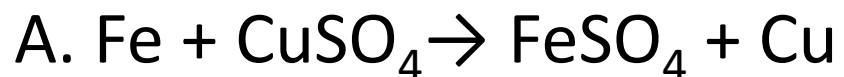


Neutral solution have zero pH

Q) Which one of the following chemical reactions is not feasible?



Q) Which one of the following chemical reactions is not feasible?



ACTIVITY SERIES	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	



(C) Reaction is not possible because in the metal reactivity series, copper being below hydrogen and it is unable to displace lead from its solution

Q) The elements of which of the following pairs are isobars?

- A. 1_1H and 3_1H
- B. 1_1H and 2_1H
- C. ${}^{12}_6C$ and ${}^{14}_6C$
- D. ${}^{40}_{18}Ar$ and ${}^{40}_{20}Ca$

Q) The elements of which of the following pairs are isobars?



Isobars have same Mass Number and different Atomic Number.

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

List-I(Compound)

- A) Boric acid
- B) Citric acid
- C) Magnesium Hydroxide
- D) Acetic acid

List-II(Use)

- 1) Antiseptic
- 2) Food preservative
- 3) Antacid Hydroxide
- 4) Pickle

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

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

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

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

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

List I

- A. Bleaching Powder
- B. Baking Soda
- C. Washing Soda
- D. Slaked Lime

List II

- 1. NaHCO_3
- 2. $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$
- 3. $\text{Ca}(\text{OH})_2$
- 4. CaOCl_2

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

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

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

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

Q) Which one of the following carbon allotropes is/are good conductors of electricity ?

1. Diamond
 2. Graphite
 3. Fullerene
- A. 1 only
 - B. 1 and 2 only
 - C. 2 only
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Q) What is the approximate percentage of carbon in the earth crust?

- A. 0.045%
- B. 0.025%
- C. 0.015%
- D. 0.005%

Q) What is the approximate percentage of carbon in the earth crust?

A. 0.045%

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C. 0.015%

D. 0.005%

Carbon is the **15th most abundant** element in all the elements present in the earth's crust.

It is the **4th most abundant in the universe** after hydrogen, helium and oxygen.

Q) When copper reacts with moist carbon dioxide (CO_2) in air, it forms green coating of which one of the following elements?

- A. Copper carbonate
- B. Cuprous oxide
- C. Cupric oxide
- D. Copper sulphate

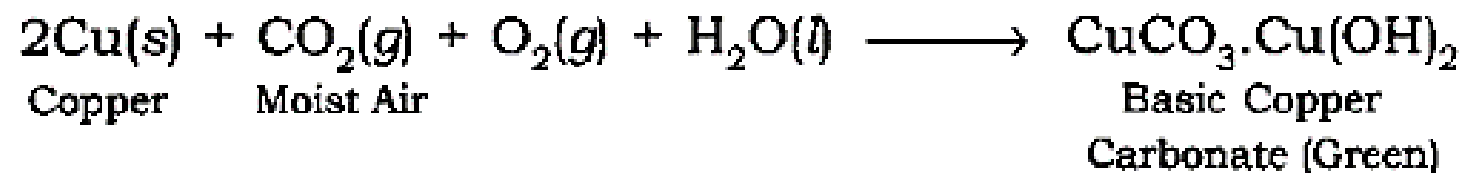
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Q) What is the name of process that converts sulphide ores in oxides by heating strongly in the presence of excess air?

- A. Calcination
- B. Roasting
- C. Smelting
- D. Incineration

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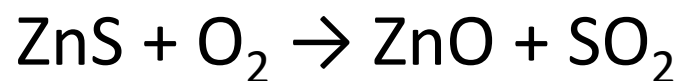
A. Calcination

B. Roasting

C. Smelting

D. Incineration

Heating the ore in presence of excess air below the melting point is called roasting.



Q) Solder is an alloy of ?

- A. Pb and Zn
- B. Pb and Sn
- C. Pb and Si
- D. Pb and Co

Q) Solder is an alloy of ?

- A. Pb and Zn
- B. Pb and Sn**
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Common Types of Alloys



Steel

combination of iron (metal)
and carbon (non-metal)



Bronze

combination of copper (metal)
and tin (metal)



Brass

mixture of copper (metal)
and zinc (metal)

Q) Which one of the following is the correct reactivity order of metals reacting with dilute HCl ?

- A. $\text{Mg} > \text{Al} > \text{Zn} > \text{Fe}$
- B. $\text{Mg} < \text{Al} < \text{Zn} < \text{Fe}$
- C. $\text{Mg} > \text{Zn} > \text{Fe} > \text{Al}$
- D. $\text{Fe} > \text{Mg} > \text{Al} > \text{Zn}$

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C. $\text{Mg} > \text{Zn} > \text{Fe} > \text{Al}$

D. $\text{Fe} > \text{Mg} > \text{Al} > \text{Zn}$

How to remember the Reactivity Series?

Please

Stop

Calling

Me

A

Careless

Zebra

Instead

Try

Learning

How

Copper

Saves

Gold

Potassium

Sodium

Calcium

Magnesium

Aluminium

(Carbon)

Zinc

Iron

Tin

Lead

(Hydrogen)

Copper

Silver

Gold

Most reactive



Least reactive

Q) Which one of the following acids is secreted by leaves of Nettle that causes painful stings?

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

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- B. Citric acid
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- D. Acetic acid



Leaves of the nettle plant secrete methanoic acid which causes a painful sting on touching.

Q) Which of the following statements is/are correct?

- 1. All the bases are alkali.**
- 2. All alkalis dissolve in water.**
- 3. Alkalis are soapy to touch, bitter in taste and corrosive in nature.**

Select the correct answer using the code given below:

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

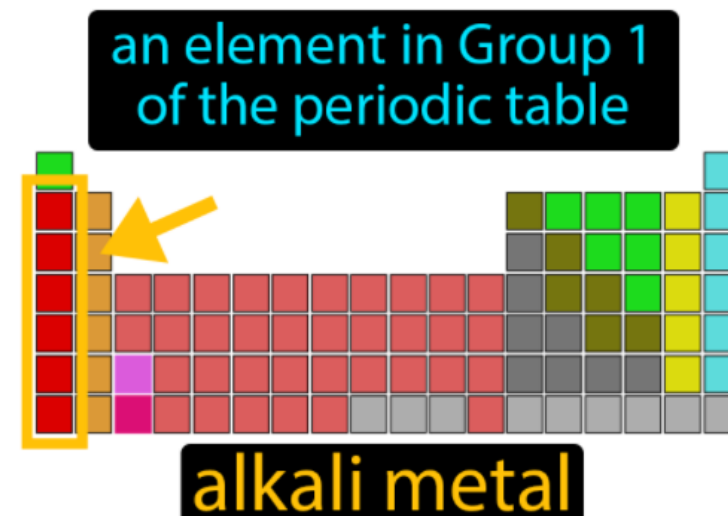
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Select the correct answer using the code given below:

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

All the bases are not alkali, however all alkalis are bases.



Q) Fertilizers are used to obtain higher yields of crops. However, all nutrients are usually not available in fertilizers. Which one of the following nutrients is usually not available in fertilizers ?

- A. Iron
- B. Potassium
- C. Nitrogen
- D. Phosphorus

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- D. Phosphorus

NPK are main constituents of fertilizers.



Q) The number of moles of oxygen gas used in the complete combustion of 1 mole of glucose is:

- A. 1
- B. 3
- C. 6
- D. 12

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- B. 3
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$$\Delta H^\circ = -2816 \text{ kJ/mol} \quad \Delta S^\circ = +181 \text{ J/mol.K}$$

Q) Methanoic acid is normally found in :

- A. Muscles
- B. Urine
- C. Ant stings
- D. Human brain

Q) Methanoic acid is normally found in :

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- B. Urine
- C. Ant stings**
- D. Human brain



**Ant & Nettle Sting:
Formic Acid/
Methanoic Acid/
HCOOH**

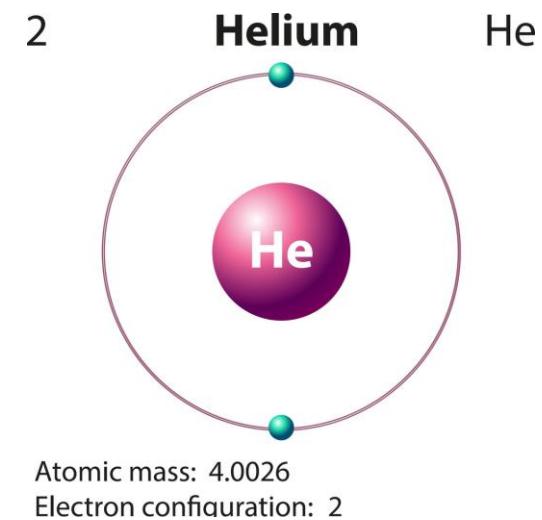
Q) What is the number of moles of 'He' in 104 g of helium gas?

- A. 52
- B. 26
- C. 13
- D. 6.5

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- A. 52
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- C. 13
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$$104/4 = 26$$



Q) While burning hydrocarbon fuels, if we see a yellow flame with lots of black smoke, it means that the fuel is:

- A. Made of saturated hydrocarbons.
- B. Made of unsaturated hydrocarbons.
- C. Burning completely.
- D. Wet.

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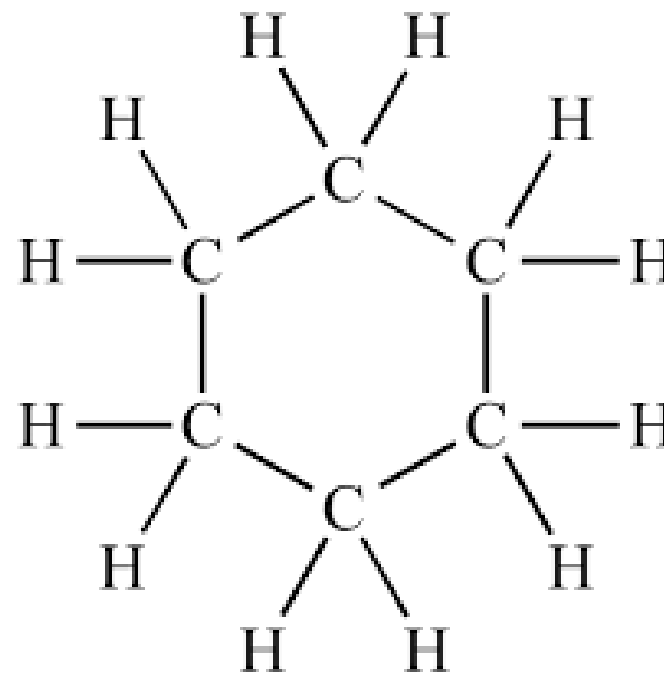
- A. Made of saturated hydrocarbons.
- B. Made of unsaturated hydrocarbons.**
- C. Burning completely.
- D. Wet.

Q) The number of saturated and unsaturated bonds in cyclohexane are:

- A. 9 and 0 respectively.
- B. 18 and 3 respectively.
- C. 18 and 0 respectively
- D. 9 and 3 respectively.

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- C. 18 and 0 respectively**
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cyclohexane

Q) Which one of the following statements is true. when non-metals are dissolved in water?

- A. They produce basic oxides.
- B. They produce acidic oxides.
- C. They produce neutral oxides.
- D. They provide hydroxides.

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Non-metallic oxides are acidic in nature

Q) Which one of the following is the main reason for acid rains?

- A. Dissolution of sulphur and nitrogen oxides in rain
- B. Dissolution of minerals in rain
- C. Dissolution of dust particles in rain
- D. Dissolution of soil solution in rain

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Q. Movement of materials to different part of cytoplasm and nucleus is generally carried out by

- (a) Ribosomes
- (b) Mitochondria
- (c) Lysosomes
- (d) Endoplasmic reticulum

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- (a) Ribosomes**
- (b) Mitochondria
- (c) Lysosomes
- (d) Endoplasmic reticulum

Ans: (a)

Explanation: A membrane termed the nuclear membrane separates the nucleus from the cytoplasm. This membrane is also permeable, allowing materials to flow between the cytoplasm and the nucleus' interior. Ribosomes are responsible for transporting materials between different regions of the cytoplasm and nucleus.

Q. In mitochondria, ATP synthesizing chemical reactions takes place in

- (a) Outer membrane
- (b) Matrix
- (c) Inner membrane
- (d) DNA of mitochondria

Q. In mitochondria, ATP synthesizing chemical reactions takes place in

- (a) Outer membrane
- (b) Matrix
- (c) Inner membrane**
- (d) DNA of mitochondria

Ans: (c)

Explanation: In mitochondria, there are two membranes – Outer and Inner. The inner membrane is folded several times to form cristae which is densely packed with proteins involved in ATP generation.

Q. Squamous epithelial cells are found in the inner lining of

- (a) Oesophagus
- (b) Small intestine
- (c) Ducts of salivary gland
- (d) Kidney

Q. Squamous epithelial cells are found in the inner lining of

- (a) Oesophagus**
- (b) Small intestine
- (c) Ducts of salivary gland
- (d) Kidney

Ans: (a)

Explanation: Squamous epithelial cells are found in the inner lining of Oesophagus. This is found as the lining of the mouth, oesophagus, and including blood

Q. Transformation of meristematic cells into specific permanent tissues occurs by the process of

- (a) Cell differentiation
- (b) Cell division
- (c) Cell multiplication
- (d) Cell regeneration

Q. Transformation of meristematic cells into specific permanent tissues occurs by the process of

- (a) Cell differentiation**
- (b) Cell division
- (c) Cell multiplication
- (d) Cell regeneration

Ans: (a)

Explanation: Transformation of meristematic cells into specific permanent tissues occurs by the process of Cell differentiation. Cells of meristematic tissues differentiate to form different types of permanent tissues.

Q. Cell wall is not present in the cells of

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

Q. Cell wall is not present in the cells of

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

Ans: (d)

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

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

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

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

(a) Golgi body and endoplasmic reticulum

(b) Mitochondria and Plastids

(c) Lysosome and Golgi body

(d) Vacuole and Plastids

Ans: (b)

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

Q. A child receives a tall, beautiful plant as a birthday gift from her father with a quiz. The father asked her how she would verify whether this tall plant was the progeny of both the tall parents or one tall and one short parent plant. She could verify this through

- (a) Cross- pollination
- (b) Self-pollination
- (c) Tissue culture
- (d) negative propagation

Q. A child receives a tall, beautiful plant as a birthday gift from her father with a quiz. The father asked her how she would verify whether this tall plant was the progeny of both the tall parents or one tall and one short parent plant. She could verify this through

- (a) Cross- pollination
- (b) Self-pollination**
- (c) Tissue culture
- (d) negative propagation

Ans: (b)

Explanation: Self – Pollination is the transfer of pollen from the anther of a flower to the stigma of the same flower or sometimes to that of a genetically identical flower (as of the same plant or clone).

Q. A student was doing an experiment on increasing the cell division among the plants. She asked her supervisor to suggest the specific plant hormone for the same. Had you been her supervisor, which plant hormone would you suggest?

- (a) Abscisic acid
- (b) Gibberellins
- (c) Cytokinin
- (d) Auxin

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- (a) Abscisic acid
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- (c) Cytokinin**
- (d) Auxin

Ans: (c)

Explanation: Cytokinins (CK) are a kind of plant hormone that promotes cytokinesis (cell division) in plant roots and shoots. They are largely engaged in cell growth and differentiation.

Q. Which of the following is a defining property of living organisms?

- (a) Growth
- (b) Reproduction
- (c) Metabolism
- (d) None

Q. Which of the following is a defining property of living organisms?

- (a) Growth
- (b) Reproduction
- (c) Metabolism**
- (d) None

Ans: (c)

Explanation: Metabolism is a defining feature of all living organisms without exception. All plants, animals, fungi and microbes exhibit metabolism. The sum total of all the chemical reactions occurring in our body is metabolism.

Q. Which of the following are the twin characteristics of Growth?

- (a) Increase in Mass and number
- (b) Increase in size and number
- (c) Both (a) and (b)
- (d) None of the above

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

Ans: (a)

Explanation: Increase in mass and increase in number of individuals are twin characteristics of growth.

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

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

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

Ans: (a)

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

Q. What are the basic processes of Taxonomy?

- (a) Identification
- (b) Classification
- (c) Nomenclature
- (d) All the above

Q. What are the basic processes of Taxonomy?

- (a) Identification
- (b) Classification
- (c) Nomenclature
- (d) All the above**

Ans: (d)

Explanation: Based on characteristics, all living organisms can be classified into different taxa. This process of classification is taxonomy. Characterization, identification, classification and nomenclature are the processes that are basic to taxonomy.

Q. The lowest taxonomic taxon is

- (a) Genus
- (b) Phylum
- (c) Species
- (d) Kingdom

Q. The lowest taxonomic taxon is

- (a) Genus
- (b) Phylum
- (c) Species**
- (d) Kingdom

Ans: (c)

Explanation: Species is the lowest or basic taxonomic category, which consists of one or more individuals of a population.

Q. The place where wild animals are kept under protected environment and human care

- (a) Zoos
- (b) Gardens
- (c) Parks
- (d) Home

Q. The place where wild animals are kept under protected environment and human care

- (a) Zoos**
- (b) Gardens
- (c) Parks
- (d) Home

Ans: (a)

Explanation: Zoological parks are the places where wild animals are kept in protected environments under human care and which enable us to learn about their food habits and behavior.

Q. The taxonomical aid used for identification of plants and animals based on contrasting characters

- (a) Manuals
- (b) Monographs
- (c) Flora
- (d) Keys

Q. The taxonomical aid used for identification of plants and animals based on contrasting characters

- (a) Manuals
- (b) Monographs
- (c) Flora
- (d) Keys**

Ans: (d)

Explanation: Key is a taxonomical aid used for identification of plants and animals based on the similarities and dissimilarities. It is based on the contrasting characters generally in a pair called couplet. Each statement in the key is called a lead.

Q. ICVN stands for?

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

Q. ICVN stands for?

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

Ans: (b)

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

Q. The specific epithet in *Rana tigrina*

- (a) Rana
- (b) Tigrina
- (c) *tigrina*
- (d) *Rana*

Q. The specific epithet in *Rana tigrina*

- (a) Rana
- (b) Tigrina
- (c) *tigrina***
- (d) *Rana*

Ans: (c)

Explanation: The species name is tigrina. Must be printed in italics or when written must be underlined separately.

Q. What is the first step in Systematics?

- (a) Characterization
- (b) Identification
- (c) Nomenclature
- (d) Classification

Q. What is the first step in Systematics?

(a) Characterization

(b) Identification

(c) Nomenclature

(d) Classification

Ans: (a)

Explanation: The organisms which are selected for the study or chosen for the study needs to be described based on its morphological characters. This process is called Characterization. Based on characterization, Identification is done

Q. Which among the classification system is most widely accepted?

- (a) Six Kingdom
- (b) Two Kingdom
- (c) Five Kingdom
- (d) Four Kingdom

Q. Which among the classification system is most widely accepted?

- (a) Six Kingdom
- (b) Two Kingdom
- (c) Five Kingdom**
- (d) Four Kingdom

Ans: (c)

Explanation: Five kingdom system proposed by Whittaker is most widely accepted and includes Monera, Protista, Fungi, Animalia and Plantae.

Q. Which of the following are found in marshy areas?

- (a) Methanogens
- (b) Halophiles
- (c) Acidophiles
- (d) None of the above

Q. Which of the following are found in marshy areas?

- (a) Methanogens**
- (b) Halophiles
- (c) Acidophiles
- (d) None of the above

Ans: (a)

Explanation: These bacteria are special since they live in some of the harshest habitats such as extreme salty areas (halophiles), hot springs (thermoacidophiles) and marshy areas (methanogens).

Q. Which one of the following organisms has vascular tissues?

- a) *Cladophora*
- b) *Penicillium*
- c) *Marsilea*
- d) *Anabaena*

Q. Which one of the following organisms has vascular tissues?

- a) *Cladophora*
- b) *Penicillium*
- c) ***Marsilea***
- d) *Anabaena*

Ans: (c)

Explanation: *Marsilea* (aquatic fern) is a genus of the family Marsileaceae. *Marsilea* has vascular tissue. The species of *Marsilea* are generally aquatic or amphibious in nature with their roots embedded in mud or damp soil.

Q. Statement I: Phytoplankton produce most of the organic carbon in the ocean

Statement II: Algae are produced in the cold water biome

- a) Both the statements are individually true but statement II is the correct explanation of Statement I
- b) Both the statements are individually true but statement II is not the correct explanation of Statement I
- c) Statement I is true but Statement II is false
- d) Statement I is false but Statement II is true

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- d) Statement I is false but Statement II is true

Ans: (c)

Explanation: Algae are found in a wide variety of habitats like fresh water, marine, moist stones, soils, wood, etc.

Q. Which one of the following statements about classification of plants is correct?

- a) Thallophytes have well differentiated body design
- b) Funaria is a fungus
- c) All Pteridophytes are phanerogams
- d) Vascular system is not found among Bryophytes

Q. Which one of the following statements about classification of plants is correct?

- a) Thallophytes have well differentiated body design
- b) *Funaria* is a fungus
- c) All Pteridophytes are phanerogams
- d) Vascular system is not found among Bryophytes**

Ans: (d)

Explanation: Bryophytes do not have vascular tissues (Xylem and Phloem). Phanerogams include Angiosperms and Gymnosperms. *Funaria* is a moss. Thallophytes have simple plant body.

Q. Gametophytes of sexually reproducing flowering plants are.

- a) Haploid
- b) Diploid
- c) Tetraploid
- d) Polyploid

Q. Gametophytes of sexually reproducing flowering plants are.

- a) **Haploid**
- b) Diploid
- c) Tetraploid
- d) Polyploid

Ans: (a)

Explanation: The gametophytes of the sexually reproducing flowering plants is haploid (n).

Q. *Marsilea*, fern and Horsetails are examples of which one of the following plant groups?

- a) Pteridophyta
- b) Bryophyta
- c) Gymnosperms
- d) Angiosperms

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- a) Pteridophyta**
- b) Bryophyta
- c) Gymnosperms
- d) Angiosperms

Ans: (a)

Explanation: *Marsilea*, Fern and Horsetails are examples of the plant group Pteridophyta.

Q. Which of the following does not possess a specialized conducting tissue for transport of water and other substances in plants?

- a) *Marchantia*
- b) *Marsilea*
- c) *Cycas*
- d) Fern

Q. Which of the following does not possess a specialized conducting tissue for transport of water and other substances in plants?

- a) *Marchantia*
- b) *Marsilea*
- c) *Cycas*
- d) Fern

Ans: (a)

Explanation: Pteridophytes, Gymnosperms and Angiosperms possess vascular tissues. *Marchantia* is an example of Bryophytes.

Q. Which one of the following body parts/organs of the human body does not have smooth muscles?

- a) Ureters
- b) Iris of the eye
- c) Bronchi of lungs
- d) Biceps

Q. Which one of the following body parts/organs of the human body does not have smooth muscles?

- a) Ureters
- b) Iris of the eye
- c) Bronchi of lungs
- d) Biceps**

Ans: (d)

Explanation: In a typical muscle such as the biceps, striated (striped) skeletal muscle fibres are bundled together in a parallel fashion.

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

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

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

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

Ans: (a)

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

Q. Viroids differ from viruses in having?

- (a) DNA with capsid
- (b) DNA without capsid
- (c) RNA with capsid
- (d) RNA without capsid

Q. Viroids differ from viruses in having?

- (a) DNA with capsid
- (b) DNA without capsid
- (c) RNA with capsid
- (d) RNA without capsid**

Ans: (d)

Explanation: Viroids lacked the protein coat that is found in viruses, hence the name viroid. It consists of RNA as a genetic material

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

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

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

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

Ans: (b)

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

Q. The agents responsible for mad-cow disease transmission

- (a) Virus
- (b) Virion
- (c) Prions
- (d) Viroids

Q. The agents responsible for mad-cow disease transmission

- (a) Virus
- (b) Virion
- (c) Prions**
- (d) Viroids

Ans: (c)

Explanation: Prions are the infectious, proteinaceous agents which are responsible for causing Bovine spongiform encephalopathy (BSE) commonly called mad cow disease in cattle.

Q. Which of the following groups are included under the Kingdom Protista?

- (a) Slime moulds
- (b) Protozoans
- (c) Chrysophytes
- (d) All the above

Q. Which of the following groups are included under the Kingdom Protista?

- (a) Slime moulds
- (b) Protozoans
- (c) Chrysophytes
- (d) All the above**

Ans: (d)

Explanation: Chrysophytes, Dinoflagellates, Euglenoids, Slime moulds and Protozoans are included under Kingdom Protista.

Q. Which of the following is extensively used for genetic work?

- (a) *Aspergillus*
- (b) *Mucor*
- (c) *Neurospora*
- (d) *Albugo*

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- (a) *Aspergillus*
- (b) *Mucor*
- (c) *Neurospora***
- (d) *Albugo*

Ans: (c)

Explanation: *Neurospora*, belonging to Ascomycetes (Kingdom Fungi) is used extensively in biochemical and genetic work

Q. Which one of the following do not grow in polluted areas?

- (a) Lichens
- (b) Diatoms
- (c) Only (a)
- (d) Both (a) and (b)

Q. Which one of the following do not grow in polluted areas?

- (a) Lichens
- (b) Diatoms
- (c) Only (a)
- (d) Both (a) and (b)**

Ans: (d)

Explanation: Both Lichens and Diatoms are particularly good pollution indicators.

Q. *Gonyaulax* belongs to

- (a) Ascomycetes
- (b) Dinoflagellates
- (c) Mycoplasma
- (d) Cyanobacteria

Q. *Gonyaulax* belongs to

- (a) Ascomycetes
- (b) Dinoflagellates**
- (c) Mycoplasma
- (d) Cyanobacteria

Ans: (b)

Explanation: It is a red dinoflagellate which belong to Kingdom Protista and responsible for red tides.

Q. Which of the following are endoparasites?

- (a) *Paramecium*
- (b) *Plasmodium*
- (c) *Chlamydomonas*
- (d) None of the above

Q. Which of the following are endoparasites?

- (a) *Paramecium*
- (b) *Plasmodium***
- (c) *Chlamydomonas*
- (d) None of the above

Ans: (b)

Explanation: *Plasmodium* is an endoparasite and causes malaria. It belongs to sporozoans.

Q. Bentham and Hooker's classification is also called as?

- (a) Phenetic classification
- (b) Prior classification
- (c) Cladistic classification
- (d) Phylogenetic classification

Q. Bentham and Hooker's classification is also called as?

- (a) Phenetic classification**
- (b) Prior classification
- (c) Cladistic classification
- (d) Phylogenetic classification

Ans: (a)

Explanation: The Bentham and Hooker's classification was published in a three-volume work as "*Genera Plantarum*". It is called the natural system of classification, also known as Phenetic classification (based on total and relative number of shared characters).

Q. Phylogenetic classification of flowering plants was proposed by?

- (a) Arthur Cronquist
- (b) Bentham and Hooker
- (c) Engler and Prantl
- (d) None of the above

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- (a) Arthur Cronquist**
- (b) Bentham and Hooker
- (c) Engler and Prantl
- (d) None of the above

Ans: (a)

Explanation: Arthur Cronquist, an American taxonomist proposed phylogenetic classification of flowering plants based on a wide range of taxonomic characters including anatomical and phytochemical characters of phylogenetic importance.

Q. Prokaryotic unicellular organisms are included under the Kingdom?

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

Q. Prokaryotic unicellular organisms are included under the Kingdom?

(a) Monera

(b) Protista

(c) Fungi

(d) Plantae

Ans: (a)

Explanation: Kingdom Monera includes all the unicellular prokaryotic organisms.

Q. The network of Hyphae is known as.

- (a) Septae
- (b) Coenocyte
- (c) Mycelium
- (d) All the above

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- (a) Septae
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- (c) Mycelium**
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Ans: (c)

Explanation: The Fungi are filamentous, and their bodies consist of long, slender thread-like structures called hyphae. The network of hyphae is known as mycelium.

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

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

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

Ans: (c)

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

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

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

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

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

Ans: (c)

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

Q. Cell wall of any fungus is different from plants in having

- a) Cellulose
- b) Chitin
- c) Cholesterol
- d) Glycogen

Q. Cell wall of any fungus is different from plants in having

- a) Cellulose
- b) Chitin**
- c) Cholesterol
- d) Glycogen

Ans: (b)

Explanation: Cell wall of fungi is made up of Polysaccharide and Chitin.

Q. Malarial parasite is a?

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

Q. Malarial parasite is a?

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

Ans: (b)

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

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

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

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

Ans: (a)

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

Q. Which one of the following statements explains the higher mutation rates and faster evolution found in RNA Viruses?

- a) RNA is relatively unstable compared to DNA
- b) Virus can multiply only within the living cell of a host
- c) Metabolic processes are absent in virus
- d) Virus can remain latent for a long period

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- a) RNA is relatively unstable compared to DNA**
- b) Virus can multiply only within the living cell of a host
- c) Metabolic processes are absent in virus
- d) Virus can remain latent for a long period

Ans: (a)

Explanation: RNA has very high mutation rates which allows them to evolve faster. They are unstable compared to DNA and they do not have any repair mechanisms like the DNA. Example is the resistance to drugs developed by the HIV.

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

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

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

Ans: (b)

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

Q. Most viruses that infect plants possess

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

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

Ans: (b)

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

Q. Which of the following algae reproduce by oogamy?

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

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

Ans: (c)

Explanation: Fusion between one large, non-motile (static) female gamete and a smaller, motile male gamete is termed oogamous. Examples include *Volvox*, *Fucus*.

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

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

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

Ans: (a)

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

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