

VI - Chemistry

Arsh

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Chapter - 2

ELEMENTS, COMPOUNDS AND MIXTURES

Recalling Ideas :

Ex - I Select the correct option :-

- | | | |
|---------------|----------------|----------------|
| 1. (b) Hg | 4. (a) Sodium | 7. (c) Bromine |
| 2. (c) Sodium | 5. (c) Water | |
| 3. (d) gold | 6. (c) protons | |

Ex - II True / False :-

- | | | |
|----------|-----------------------|-------------|
| 1. False | A molecule | An atom |
| 2. True | | |
| 3. False | non-metal | metal |
| 4. True | | |
| 5. False | fixed | any |
| 6. True | | |
| 7. False | heterogeneous | homogeneous |

Ex - III Fill in the blanks :-

- | | | |
|---------------|---------------|------------|
| 1. malleable. | 4. a molecule | 7. symbols |
| 2. good | 5. whole | |
| 3. elements | 6. different | |

Ex - IV Match the following :-

- | | |
|--------------------------------|---|
| 1. atom | 3 |
| 2. graphite | 4 |
| 3. smallest unit of a compound | 5 |
| 4. helium | 1 |
| 5. mercury | 2 |

Ex - V Complete the table :-

- | | |
|--------|--------------------|
| 1. CaO | calcium and oxygen |
| PbO | lead and oxygen |

PbS	lead and sulphur
CuS	copper and sulphur
FeS	Iron and sulphur

2.	ZnS	2	Zinc, Sulphur
	NH ₃	2	Nitrogen, hydrogen
	H ₂ SO ₄	3	Hydrogen, Sulphur, oxygen
	HCl	2	Hydrogen, Chlorine
	NaCl	2	Sodium, Chlorine

3.	Diamond	Element	One kind of atom (Carbon)
	Carbon dioxide	Compound	Carbon and oxygen chemically combined
	Air	Mixture	Components retain their own properties
	Sea water	Mixture	Components retain their own properties
	Pure water	Compound	Hydrogen and oxygen chemically combined
	Iron	Element	One kind of atom (Iron)
	Ammonia	Compound	Nitrogen and hydrogen chemically combined
	Soda water	Mixture	Components retain their own properties
	Table salt	Compound	Sodium and chlorine chemically combined

Understanding Ideas

Ex I Answer in one word or one sentence. :-

1. Three.
2. A chemical formula represents one molecule of an element or compound.
3. No
4. More than three atoms.
5. Neutron and Proton

Ex II Define. :->

1. An atom is the smallest particle of an element.
2. A molecule is the smallest unit of a compound.
3. A mixture in which the components are not distributed uniformly is called heterogeneous mixture.

Ex-III

Answer the questions in short. :->

Ans 1: Element is a pure substance which can neither be broken down into simpler substances nor formed by any physical or chemical process.
eg: Iron, Lead, Copper, Hydrogen, Oxygen...

Ans 2: (a) Gold, silver.
(b) Copper, gold.

Ans 3: Non metals are chemical elements that don't have the properties of metals.
eg - Carbon, oxygen, nitrogen, sulphur

Ans 4: A compound is a chemical combination of two or more elements. eg - water, salt, sugar, carbon dioxide, ammonia.

Ans 5: (a) Carbon, Calcium
(b) Silver, Gold, Aluminium

Ans 6: Valency is the combining capacity of an element.
Na = 1 Mg = 2 Ca = 2 Al = 3

Ans 7: a) Fe b) Au c) Na
d) O e) C f) S
g) Ag h) Ca

Ans 8: a) Aluminium b) Copper c) Magnesium
d) Nitrogen e) Mercury f) Phosphorus
g) Zinc h) Lead

Ans 9: a) O₂ b) Cl₂ c) N₂ d) H₂

Ans 10: a) $ZnCl_2$ b) CO_2 c) KOH d) ZnS e) MgO
 f) N_2O

Ans 11: a) Zinc oxide b) Copper oxide
 c) Calcium sulphide d) Iron sulphide

Ans 12: Pure substance is a kind of matter that cannot be separated into components by any physical means. Yes, milk is a pure substance because its components are distributed uniformly and cannot be separated by physical means.

Ex-IV Long-question answers :->

Ans 1: Metal is a material that is typically hard, opaque, shiny and good conductor of heat and electricity. Eg. - silver, gold, zinc, sodium.

Ans 2: A molecule of a compound has atoms of different elements combined in a fixed whole number ratio. But a molecule of an element has atoms of same element.

Ans 3:	Metals	Non-metals
1.	Shiny surface	Dull surface
2.	High density	Low density
3.	High melting point	Low melting point
4.	High boiling point	Low boiling point
5.	Ductile	Non-ductile
6.	Malleable	Non-malleable

- Ans 4:
1. A compound is a pure substance.
 2. It is homogeneous.
 3. Its elements cannot be separated by physical methods.
 4. It has distinct properties.
 5. Energy is released or absorbed during the formation of compound.

Compounds	Mixtures
1. Components are combined chemically.	Components are mixed mechanically.
2. Components are in fixed ratio.	Components are in any proportion.
3. Components cannot be separated by physical methods.	Components can be separated by physical methods.
4. Components do not retain their own properties.	Components retain their own properties.

- Ans 6: Characteristics of mixtures:
1. In a mixture, the components are mixed mechanically in any ratio.
 2. Each component retain their original properties.
 3. The components of a mixture can be separated by simple physical processes.
 4. Formation of mixtures doesnot involve any energy exchange.

Think Critically :->

Ans 1: Sand and sugar together is a mixture because components retain their original properties and can be separated by physical means.

Ans 2: Air is a mixture because components are mixed in any ratio and they retain their original properties.

Diagram based question :-

- A - Physical changes.
- B - Pure substances
- C - Chemical changes.
- D - Compounds
- E - Homogeneous
- F - Heterogeneous.

Chapter - 6 Air and Atmosphere

Recalling Ideas :

Ex - I Select the correct option :-

1. (b) carbon dioxide
2. (d) carbon dioxide & sulphur dioxide
(b) oxygen and nitrous oxide
3. (c) nitrogen
4. (b) carbon dioxide
5. (b) hot air is lighter than cold air

Ex - II Fill in the blanks :-

1. not constant 3. Warm, cool 5. Carbon dioxide
2. Carbon dioxide 4. Carbon dioxide

Ex - III True / False :-

1. False, oxygen, Nitrogen
2. True
3. True
4. False, exhaled, inhaled
5. False, respiration - breathing

Ex - IV Match

5

4

6

2

1

3

Understanding Ideas :

Ex - I Answer in one word :

1. Oxygen

2. The amount of water vapour in the air is humidity.
3. 21%
4. Chlorophyll
5. Carbon dioxide
6. Coal, diesel

Ex. II Define the terms :

1. The air we breathe in is called inhaled air.
2. The air we breathe out is called exhaled air.
3. The blanket of air around the earth is called atmosphere.
4. Respiration is the process of breaking down of digested food by oxygen to release energy.
5. The harmful and undesirable substances mixed in air are called pollutants.

Ex. III Answer in short :

Ans 1 (a) Carbon dioxide :

1. It is used in aerated drinks.
2. It is used in fire extinguishers.
3. It is used by plants in photosynthesis.

(b) Nitrogen :

1. It is used for manufacturing fertilizers.
2. Liquid nitrogen is used as refrigerant.
3. It is used in packaging ready to eat food items to keep them fresh.

Ans 2: Animals need more energy, because they have to move from place to place in search of food.

Ans 3: Photosynthesis : $\text{CO}_2 + \text{water} \xrightarrow[\text{chlorophyll}]{\text{sunlight}} \text{Glucose} + \text{oxygen}$

Respiration :

$\text{Glucose} + \text{oxygen} \xrightarrow{\text{Respiration}} \text{CO}_2 + \text{water} + \text{energy}$

Ans 4:	Component	Inhaled air	Exhaled air
	Oxygen	20.9%	17%
	Carbon-dioxide	0.034%	4%

Ans 5: Respiration, because sunlight is not required for respiration.

Ans 6: Carbon monoxide, Carbon dioxide, Nitrogen dioxide, sulphur dioxide etc.

Ex-IV Answer in detail:

Ans 1: Air is a mixture because -

1. The composition of air is not constant.
2. The components of air retain their identity.
3. The components of air can be separated by physical methods.

Ans 2: 1. Take a glass filled with ice cubes.

2. Leave it in air for some time.

3. Water droplets will appear on the outer surface of the glass.

4. This is due to condensation of the water vapours present in the air.

5. Thus, it shows air contains water vapours.

Ans 3: 1. Excess of carbon dioxide causes suffocation.

2. Carbon monoxide reduces oxygen carrying capacity of blood.

3. Sulphur dioxide causes headache, vomiting etc.

4. Nitrogen oxide affects the respiratory system of animals.

Ans 4: If a burning matchstick is brought near to the source and it starts burning brightly than earlier, this shows that gas is oxygen.

Ans 5: Plants need nitrogen to build proteins. Proteins are essential for growth and development of plants.

- Ans 6:
1. It prevents all the heat from the sun reaching the earth.
 2. It helps in maintaining temperature on the earth.
 3. It helps in movement of water vapour in the form of clouds and cause rainfall.

Think Critically :-

Ans 1: Same as Ans 1 Ex-IV

Ans 2: During photosynthesis oxygen is produced and released in the atmosphere which is used by animals for respiration and animals depend directly or indirectly on food made by plants.

Ans 3: At night, the tree will undergo only respiration and there will be no photosynthesis. Hence, carbon dioxide gas will be liberated and so it will not be safe to sleep under a tree at night.

Diagram based question :-

A - Sunlight

D - Carbon dioxide

B - Oxygen

E - Photosynthesis

C - Respiration

F - Water & minerals

Chapter - 1

MATTER

Test Yourself - 1 (Pg-5)

Fill in the blanks -

1. mass, space
2. solids, liquids and gas
3. gas
4. definite
5. liquid

Exercise - A Multiple choice questions

1. a 2. c 3. b 4. d

Ex - B True or False

1. False 2. False 3. True 4. False

Ex - C Fill in the blanks

1. mass, space
2. gas
3. solid
4. liquid

Ex - D Match the following

1. atoms and molecules
2. gas
3. cat
4. liquid
5. solid

Ex - E Name the following

1. Matter
2. solid, liquid, gas
3. Stone, book

Ex - F Give reasons

- Ans 1. Because particles of air flow or spread in all directions as they are loosely packed.
- Ans 2. Since the particles can move, the liquid can flow and take the shape of the container.
- Ans 3. Inflated balloon is heavier because it has weight of balloon skin and the air inside.
- Ans 4. Solids have strong inter-molecular force of attraction as compared to liquid.

Ex - G Differentiate between -

Ans 1.	<u>Solid</u>	<u>Liquid</u>
	1. Definite shape	No fixed shape
	2. Definite volume	Definite volume
	3. Cannot be compressed	Cannot be compressed
	4. Cannot flow	Can flow
	Eg - Pencil, stone	Eg - Water, milk

Ans 2.	<u>Liquid</u>	<u>Gas</u>
	1. No fixed shape	No fixed shape
	2. Definite volume	No fixed volume
	3. Cannot be compressed	Can be compressed
	Eg - Water, milk	Eg - Air, steam

Ex. - H Short answer questions

Ans 1: Anything that has mass and occupies space.

Ans 2. Liquids - 1. No fixed shape
2. Definite volume.

Ans 3. Solids - Pen, table, stone
Liquids - Milk, water
gas - Air, steam

Ans 4. Water has fixed volume but gas has no fixed volume.
Water cannot be compressed but gas can be compressed.

Chapter - 2

Physical Quantities And Measurement

Pg-17 Test Yourself-1

1. physical
2. numerical and units
3. length
4. Ruler and measuring tape
5. 2.5 cm

Pg-23 Test Yourself-2

1. mass
2. gram and kilogram
3. 3.5
4. stopwatch
5. second

Pg-28 Test Yourself-3

1. Temperature
2. Clinical
3. laboratory
4. Fahrenheit/degree Celsius
5. area

Ex-A Multiple choice questions:

1. (a) length
2. (c) area
3. (b) 600 seconds
4. (a) degree Celsius
5. (a) kilogram

Ex-B True/False

1. True
2. False
3. False
4. True
5. False

Ex-C Fill in the blanks:

1. millimetres (mm)
2. 60
3. parallax
4. Laboratory
5. cm

Ex-D Match the following:

- | | | | |
|--------------------|---|-------------------|---|
| i) 1. 1 centimetre | 3 | (ii) 1. stopwatch | 3 |
| 2. 100 centimetre | 1 | 2. beam balance | 4 |
| 3. 1000 metres | 2 | 3. kink | 1 |
| 4. 0.1 metre | 4 | 4. hot objects | 2 |

Ex-E Name the following :

1. Mass 2. Beam balance 3. Degree Celsius
4. Clinical thermometer 5. Clock/Watch

Ex-F Diagram based question :

1. i) 1400 hrs (ii) 1800 hrs (iii) 06:10 am (iv) 11:50 am (v) 07:00 pm

2. Area of figure A = No. of full squares + $\frac{1}{2}$ (No. of half squares)

$$= 5 + \frac{1}{2}(2)$$

$$= 5 + 1 = 6 \text{ cm}^2$$

Ex-G Differentiate :-

Ans 1:

Clinical thermometer	Laboratory thermometer
1. Measure temperature of human body.	Measure temperature of objects in lab.
2. Temperature range is 35°C to 42°C .	Temperature range is -10°C to 110°C .
3. It has kink.	It has no kink.

Ans 2:

Ruler	Measuring tape
1. It is used by students.	It is used by tailors.
2. It is made of non-flexible material.	It is made of flexible material.
3. It is generally 15 cm (6 inches) or 30 cm (12 inches) long.	It is generally more than one metre long.

Beam balance

Electronic balance

Standard weights are needed to measure the mass of an object. It is non-digital.

Mass of an object is measured electronically and is displayed on the LCD screen. It gives more accurate measurements.

Ex - H Numerical questions :

Ans 1: Length = 10 m = 1000 cm
Breadth = 5 m = 500 cm

Ans 2: Thickness of 15 coins is = 10.5 cm
" " 1 coin " = $\frac{10.5}{15}$
= 0.7 cm

Ans 3: 1 quintal = 100 Kg

Ans 4: 500 cm = 5 m

Ans 5: 2 Kg = 2000 g

Ex - I Give reasons :

Ans 1: To prevent the back flow of mercury so that the temperature of human body can be read after taking it out from the body.

Ans 2: Normal temperature of human body is about 37°C soⁱⁿ the clinical thermometer, lowest mark is 35°C and highest is 42°C .

Ans 3: Because it has no kink in the mercury column. Temperature will fall immediately when it is taken out from the human body.

Ex - J Short answer questions :

Ans 1: Something that can be measured is physical quantity.

Ans 2: Ruler, metre rod, measuring tape.

Ans 3: Mass of an object is the quantity of matter present in an object.

Ans 4: Beam balance, electronic balance

Ans 5: Interval between two instances or events is called time.

Ans 6: Clock, watch, stopwatch

Ans 7: Area of rectangle = length \times breadth.

Chapter - 6 MAGNETISM

Test Yourself - 1 (Pg - 78)

Fill in the blanks

1. magnetic.
2. Magnetite, artificial
3. north - south
4. two
5. like, unlike

Test Yourself - 2 (Pg - 84)

1. Magnetisation
2. Electromagnetism
3. Electromagnet
4. Induction
5. Permanent needle magnet

Exercise - A Multiple choice questions.

1. b 2. a 3. d 4. b 5. b

Ex - B True or False.

1. False 2. True 3. False 4. True
5. False 6. True

Ex - C Fill in the blanks.

1. South
2. electromagnet.
3. magnetic field.
4. Heating, dropping and hammering
5. bar magnet keeper, unlike.
6. north, south

Ex - D Match the following

1. Magnetism
2. Magnetite.
3. Non-magnetic.
4. Electromagnet
5. Demagnetisation

Ex - E Name the following

1. Demagnetisation
2. Magnet.
3. Poles
4. Magnetic field lines

Ex - F Diagram based questions

1. a.
2. b. Because it does not attract iron filings.
3. Yes, two pieces will act as individual magnets.

Ex - G Give reasons.

Ans 1: Force of attraction is strongest at its end.

Ans 2: To prevent demagnetisation.

Ans 3: It is an instrument, which has a tiny magnet in the form of needle at its centre, that rotates freely on a pivot. Magnet always comes to rest in the north-south direction.

Ans 4: Because molten iron core creates a magnetic field around the earth.

Ans 5: Because they lose their magnetism, when the cause producing them is removed.

Ex - H Differentiate between -

Ans 1:	Magnetic substances 1. They attracted towards a magnet. Eg - Iron, steel	Non-magnetic substances They do not attracted towards a magnet. Eg - paper, glass.
--------	--	--

Ans 2:	Temporary magnet They lose their magnetism as soon as the cause producing them is removed. Eg - electromagnets	Permanent magnet They retain their magnetism for a long time. Eg - bar magnet
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Ex - I Short answer questions -

Ans 1: Like poles repel each other and unlike poles attract each other.

Ans 2: Induction method, stroke method

Ans 3: • Amount of electric current.
• Number of turns of the coil.

Ans 4: If you reverse the direction of the electric current, the poles of magnet also get reversed.

Ans 5: 1. Heating 2. Dropping

3. Hitting the magnet with a hammer.
4. Leaving the two poles of a magnet free.

Ans 6: • Strong electromagnets are used to separate metal trash from the scrap for recycling.
• Electromagnets are used to lift heavy loads in warehouses.

Ans 7: Temporary magnet - electric bell, electromagnets
Permanent magnet - magnetic door latch, fridge magnet, compass.

Ans 8: • Induction method - This method involves simply placing the magnetic material close to a strong magnet without touching.
Eg - Iron clips get magnetised by induction method.
• Stroke method - By rubbing a magnet over the iron bar from one end to another. Repeat it 40 times in the same direction with the same pole of the magnet.
Eg - Iron nail, needle or blade can be converted into a magnet by stroke method.

Ans 9: • Magnet attracts iron and other magnetic substances.
• Magnet always rest in the north-south direction.
• Magnet has two poles - North pole, south pole.
• Like poles repel each other and unlike poles attract each other.

Ans 10: • Take a soft iron bar, place it inside a coil of copper wire with several times.

- Connect the copper wire to a battery, and pass current through the coil.
- You will observe that the iron bar gets strongly magnetised.

Ans 11: Diagram Fig. 6.12, Pg = 79.

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Chapter - 1

INTRODUCTION TO CHEMISTRY:

Recalling Ideas -

I. Select the correct option:

1. a 2. c 3. c 4. a 5. a

II. Fill in the blanks -

- | | |
|----------------|---------------------|
| 1. fertilisers | 4. insecticides |
| 2. gas jar | 5. Joseph Priestley |
| 3. China dish | |

III. True / False:

- False, Organic Bio
- False, prevents preserve
- False, William Ramsay Ernest Rutherford.
- True
- True

IV. Match the following:

4

1

5

2

3

Understanding Ideas -

I. Answer in one word:

- John Dalton
- Inorganic chemistry
- Measuring cylinder
- RDX
- Cone shaped

II Define :

1. Organic chemistry - It is the study of the structure, properties, reactions and preparation of carbon-containing compounds.
2. Central science - Chemistry is sometimes called the "central science" because it is important to other fields of science like biology, geology, physics, medicine etc.
3. Preservatives - substances added to food to prevent the growth of microorganisms.

III Answer the following questions in short -

Ans 1. Chemistry is that branch of science which deals with the study of structure, composition and properties of substances, and the changes which the substances undergo.

Ans 2: Medicines, soap, detergent, petroleum etc.

Ans 3: Organic chemistry - It is the study of the structure, properties and reactions of carbon containing compounds present in living things.
Inorganic chemistry - It is the study of the structure, properties and reactions of compounds of elements in non-living materials.

Ans 4: It is used to heat substances in lab.

Ans 5: Chemistry is called the central science because it is so important to other fields of science, like biology, geology, physics, medicine, engineering etc.

IV Answer the following questions in detail -

Ans 1: Chemistry has helped agriculture in following ways -

- Fertilizers - It improves the fertility of the soil. Eg - Urea, NPK.
- Insecticides - It is used for killing insects that destroy crops. Eg - BHC, DDT.
- Fungicides - It is used for destroying fungi that destroy crops. Eg - Hexachlorobenzene.
- Herbicides - It is used for killing weeds. Eg - Simazine.

Ans 2:

- Analytical chemistry - Chemical industry, medicine, agriculture.
- Biochemistry - Medicine, dentistry, food science.
- Inorganic chemistry - Chemical industry, paints, fuels.
- Organic chemistry - Biotechnology - health care and crop production.
- Physical chemistry - Biophysics, thermodynamics.

Ans 3:

- Follow all written and verbal instructions.
- Never work alone in the lab.
- Always wear a lab coat, goggles and gloves in the lab.

- d) Never taste or inhale chemicals
- e) Perform only those experiments given by your teacher.
- f) Wash your hands with soap and water after performing any experiment.

Ans 4: a) Cosmetics - Mixture of chemical compounds used to enhance the appearance of the body.

b) Chemicals - growth of many industries like glass, cement, textile, dye etc.

c) Medicines - antiseptics and drugs for treating various diseases.

d) Food and agriculture - Production of food preservatives, fertilisers, insecticides etc.

Ans 5: Alchemists believed they could refine base metals such as iron into precious metals such as gold if they could just find the mythical substance called philosopher's stone.

Think Critically

1. a) Beaker - It is used to measuring small quantities of liquids.
- b) Measuring cylinder - It is used for measuring volumes of liquids.
- c) Retort - It is used in distillation experiments.
- d) Flask - It is used for mixing of different solutions.
- e) Test tube - It is used to heat or mix small quantities of liquids.