7. PHYSICAL, CHEMICAL CHANGES ITS CHARACTERISTICS

SOLUTIONS

TEACHING TASK

JEE MAINS LEVEL QUESTIONS

1. Which of the following statements are correct about physical change

A) No new substances are formed

B) Parmanent and easily reversible

C) temporary and can be easily reversible **D) All the above**

Answer:A,C

Solution: Physical change $\rightarrow$No new substance, temporary, reversible. Permanent is wrong.

2. Which of the following statements are incorrect about physical change

A) Only a little heat is absorbed (or) given off **B) No loss or gain of energy**

C) Both A & B **D) None**

Answer:B

Solution:Physical changes often involve energy changes, just not chemical energy

3. Which are common examples of physical changes

A) magnetisation of iron **B) Germination of seeds**

C) Rusting of Iron **D) Curdling of milk**

Answer:A

Solution:Common examples of physical changes magnetisation of iron

4. The orginal substance can not be obtained in a .

A)Physical change **B) Chemical change**

C)slow change **D)desirable change**

Answer:B

Solution:The original substance cannot be obtained in a Chemical change

5. ZnO when heated becomes .

A)yellow B)blue C)red D)green

Answer:A

Solution:ZnO when heated becomes yellow

6. Zinc oxide is yellow when hot and white when cold This is an example of :

A)Physical change B)chemical change C)fast change D)none

Answer:A

Solution:When zinc oxide changes color from white to yellow when heated, it is considered a physical change

7. Which of the following statement is incorrect about physical change

A) In most cases, a physical change is reversible in nature

B) the chemical composition of the constituents remains the same

C) product exhibit the properties of the parent constituents

D) product formed has completely different properties as compared to its constituents

Answer:D

Solution:Product formed has completely different properties is for chemical changes, so it's incorrect for physical.

8. Which of the follwoing statements are incorrect about observations in physical change

A) Change in colour B) Change in size

C) Change in shape D) Change in composition

Answer:D

Solution: In physical change, composition remains the same, so "Change in composition" is incorrect."

9. Which of the follwoing statements are incorrect about observations in physical change

A) Change in molecular composition **B) Change in substances**

C) both A & B **D) None**

Answer:C

Solution:Both molecular composition and substance changes don't occur in physical changes

10. During the white wash lime reacts with .....in the air.

A) O_2 **B) N_2** **C)NH_3** **D)CO_2**

Answer:D

Solution:Whitewash lime ($Ca(OH)_2$) reacts with $CO_2 \rightarrow CaCO_3$.

11. Which of the following reaction burns with a brilliant white light

A) Reaction between Magnesium and Oxygen

B) Reaction between lime and water

C) Reaction netween Iron and Copper sulphate

D) All the above

Answer:A

Solution:Magnesium burns in oxygen with a bright white flame: $2Mg + O_2 \rightarrow 2MgO$

12. Blue vitriol is

A) Magnesium **B) Copper sulphate** **C) Ferrous Sulphate** **D) Iron**

Answer:B

Solution:Blue vitriol is the common name for copper(II) sulfate pentahydrate - $CuSO_4 \cdot 5H_2O$

13. The gas released when Acetic acid reacts with Baking soda

A) Oxygen **B) Carbon Dioxide** **C) Water vapour** **D) All**

Answer:B

Solution: $CH_3COOH + NaHCO_3 \rightarrow CH_3COONa + H_2O + CO_2\uparrow$

14. Substance "A" on reaction with "B" gives a gas which on passing through lime water which converts it to milky white, then the substances "A" and "B" are

A) Acetic acid and Baking soda **B) lime and water**

C) Magnesium and Oxygen **D) Copper and Iron sulphate**

Answer:A

Solution: Vinegar and baking soda reaction that produces CO_2

15. Which is the standard test to detect carbon dioxide

A) Reaction with Magnesium **B) Passing through lime water**

C) Reaction with lime stone **D) Reaction with Iron**

Answer:B

Solution:CO_2 turns limewater $[Ca(OH)_2]$ milky due to formation of $CaCO_3$

16. What is the primary difference between a physical change and a chemical change?

a. Physical changes involve a change in state, while chemical changes involve a change in composition.

b. Physical changes are reversible, while chemical changes are irreversible.

c. Physical changes release energy, while chemical changes absorb energy.

d. Physical changes only affect the appearance, while chemical changes alter the properties of substances.

Answer:A

Solution:Physical: state/appearance change; Chemical: composition change

17. Which of the following statements is true about the linkage between physical and chemical changes?

a. Physical changes are always followed by chemical changes.

b. Physical and chemical changes are completely independent of each other.

c. Physical changes can sometimes precede or follow chemical changes.

d. Physical and chemical changes occur simultaneously.

Answer:C

Solution: Physical changes can sometimes precede or follow chemical changes.

18. What is the role of energy in physical and chemical changes?

a. Physical changes absorb energy, while chemical changes release energy.

b. Physical changes release energy, while chemical changes absorb energy.

c. Both physical and chemical changes absorb energy.

d. Both physical and chemical changes release energy.

Answer:None

Solution:None of the options fully capture the complete relationship, but the most accurate general principle is:

Both physical and chemical changes can either absorb or release energy depending on the specific change.

19. Which of the following statements about exothermic reactions is false?

a) They release energy to the surroundings

b) The enthalpy change is negative

c) Examples include combustion reactions

d) Temperature of the surroundings decreases during the reaction

Answer:D

Solution:Exothermic reactions increase surrounding temperature

20. In an endothermic reaction, which factor is most likely to be observed?

a) Decrease in temperature **b) Increase in temperature**

c) No change in temperature **d) Rapid reaction rate**

Answer:A

Solution:Endothermic reactions absorb heat from surroundings

21. What is the common feature of both exothermic and endothermic reactions?

a) Release of energy **b) Absorption of energy**

c) Change in temperature **d) Formation of a new substance**

Answer:C

Solution: Exothermic reactions release energy to their surroundings, causing a temperature increase. Endothermic reactions absorb energy from their surroundings, causing a decrease in temperature.

JEE ADVANCED LEVEL QUESTIONS

MULTIPLE CORRECT ANSWER TYPE

1. Which of the following statements are incorrect

A) Rusting of iron is a chemical change.

B) Magnesium oxide is basic in nature

C) Reaction of copper sulphate with iron gives blue solution

D) Rust formula is $2Fe_2O_3.H_2O$

Answer:C,D

Solution:C) Reaction of copper sulphate with iron gives blue solution

(Incorrect: It gives a colorless solution of $FeSO_4$ and brown copper precipitate: $Fe + CuSO_4 \rightarrow FeSO_4 + Cu$)

D) Rust formula is $2Fe_2O_3 \cdot H_2O$

(Incorrect: Rust is hydrated iron(III) oxide, typically written as $Fe_2O_3 \cdot xH_2O$)

2. Which of the statements is true about chemical change

A) Heat, light or radiation such as ultraviolet may be given off or absorbed.

B) Production of sound may occur

C) A change in smell may happen

D) Formation of a bubble of gas may be accompanied

Answer:A,B,C,D

Solution:

A) Heat/light/radiation may be given off or absorbed (e.g., combustion releases heat).

B) Sound may occur (e.g., popping sound in H_2 combustion).

C) Smell may change (e.g., rotting food).

D) Gas bubbles may form (e.g., CO_2 in baking soda + vinegar reaction).

3. When a piece of wood burns, which of the following changes occur?

A. Color change **B. Formation of new substances**

C. Change in state **D. Change in mass**

Answer:A,B,C,D

Solution:A) Color change (Wood turns black/brown to ash).

B) New substances form (CO_2, H_2O, ash).

C) Change in state (Solid → Gas + Solid ash).

D) Change in mass (Mass decreases as gases escape).

REASON AND ASSERTION TYPE

A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

B) Both Assertion and Reason are true, but Reason is NOT the correct expla nation for Assertion.

C) Assertion is true, but Reason is false. D) Assertion is false, but Reason is true.

4. Assertion: Dissolving salt in water is a physical change.

Reason: The salt molecules disperse in the water, but there is no change in the chemical composition of either the salt or water.

Answer:A

Solution:Assertion: True (Physical change - salt can be recovered by evaporation)

Reason: True (No chemical bonds are broken/formed; only physical dispersion)

Relationship: Reason correctly explains the assertion

5. Assertion: Digesting food in the stomach is a chemical change.

Reason: Enzymes in the stomach break down complex food molecules into simpler substances, resulting in a change in the chemical composition of the food.

Answer:A

Solution:Assertion: True (Complex molecules → simpler ones via chemical break-down)

Reason: True (Enzymes catalyze chemical changes in molecular structure)

Relationship: Reason directly explains the chemical nature of digestion

6 Assertion: Boiling an egg is a chemical change.

Reason: The proteins in the egg white undergo a coagulation process due to the application of heat, leading to a change in chemical structure.

Answer:A

Solution:Assertion: True (Irreversible protein denaturation = chemical change)

Reason: True (Heat causes permanent structural changes in proteins)

Relationship: Reason accurately describes the chemical process

7. Assertion: Burning a piece of paper is a chemical change.

Reason: The paper undergoes a transformation where its molecular structure is altered, and new substances (ashes and gases) are formed.

Answer:A

Solution:Assertion: True (Combustion produces new substances - ash, CO_2, etc.)

Reason: True (Molecular breakdown and synthesis occur)

Relationship: Reason fully explains the chemical transformation

8. Assertion: Mixing baking soda and vinegar results in the release of gas bubbles.

Reason: This reaction involves a chemical change as the bicarbonate ions in baking soda react with the acetic acid in vinegar to produce carbon dioxide gas.

Answer:A

Solution:Assertion: True (CO_2 gas bubbles are visibly released)

Reason: True ($NaHCO_3 + CH_3COOH \rightarrow CO_2$ + other products = chemical reaction)

Relationship: Reason scientifically explains the observation

9. Assertion: Rusting of iron is a chemical change.

Reason: The iron reacts with oxygen and moisture in the air to form iron oxide, displaying a change in chemical composition.

Answer:A

Solution:Assertion: True (Iron $\rightarrow$ Iron oxide = new substance)

Reason: True ($4Fe + 3O_2 + xH_2O \rightarrow 2Fe_2O_3 \cdot xH_2O$ shows composition change)

Relationship: Reason perfectly accounts for the assertion

STATEMENT TYPE

A) Statement-I and Statement-II are True
B) Statement - I and Statement-II are False
C) Statement - I is True, Statement - II , is False
D) Statement - I is False, Statement - II is True

10. Statement-I: Reaction between Copper and Iron sulphate gives green solution

Statement-II: Iron reacts with Copper sulphate

Answer:D

Solution:Statement-I is False:

Copper (Cu) is less reactive than iron (Fe), so no reaction occurs between Cu and $FeSO_4$. No green solution forms.

Statement-II is True:

Iron does react with copper sulphate ($Fe + CuSO_4 \rightarrow FeSO_4 + Cu$), producing a green $FeSO_4$ solution and brown copper precipitate.

11. Statement-I: Rusting of iron is considered to be a chemical change

Statement-II: Rust formula is $2Fe_2O_3.H_2O$

Answer:C

Solution:Statement-I is True:

Rusting is a chemical change (iron reacts with O_2 and H_2O to form new substances).

Statement-II is False:

The correct rust formula is $Fe_2O_3 \cdot xH_2O$ (hydrated iron(III) oxide). The given formula ($2Fe_2O_3 \cdot H_2O$) is incorrect.

COMPREHENSION TYPE

Many substances undergo changes in their properties, and these changes can be broadly categorized into two types: physical changes and chemical changes. Physical changes involve alterations in the physical state or appearance of a substance without altering its chemical composition. On the other hand, chemical changes result in the formation of new substances with different chemical compositions.

12. What is the primary outcome of chemical changes?

a. Alteration in physical appearance

b. Formation of new substances with different chemical compositions

c. Change in state **d. Increase in temperature**

Answer:B

Solution:Chemical changes fundamentally alter molecular structures, creating new substances (e.g., rust from iron, CO_2 from combustion).

13. What happens to the chemical composition during a physical change?

a. It remains the same **b. It completely changes**

c. It becomes unstable **d. It becomes inert**

Answer:A

Solution:Physical changes (e.g., melting ice, dissolving salt) only affect state/appearance, not molecular identity

MATRIX MATCHING TYPE

15.	**a)**	**Zincite**	**1)**	**$NaHCO_3$**
	b)	**neela thotha**	**2)**	**CH_3COOH**
	c)	**Veniger**	**3)**	**ZnO**
	d)	**Baking soda**	**4)**	**$CuSO_4$**

Answer:a-3,b-4,c-2,d-1

Solution:

a)	Zincite	3)	ZnO1) $NaHCO_3$
b)	neela thotha	4)	$CuSO_4$
c)	Veniger	2)	CH_3COOH
d)	Baking soda	1)	$NaHCO_3$

16.	**a)**	**$Mg + O_2$**	**1)**	**Rust**
	b)	**$CH_3COOH_{(aq)} + NaHCO_{3(aq)}$**	**2)**	**Milky**
	c)	**$CO_2 + Ca(OH)_2$**	**3)**	**Gas with hissing sound**
	d)	**$4Fe + 3O_2 + 2H_2O$**	**4)**	**powdery ash**

Answer:a-4,b-3,c-2,d-1

Solution:

a)	$Mg + O_2$	4)	powdery ash
b)	$CH_3COOH_{(aq)} + NaHCO_{3(aq)}$	3)	Gas with hissing sound
c)	$CO_2 + Ca(OH)_2$	2)	Milky
d)	$4Fe + 3O_2 + 2H_2O$	1)	Rust

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS

1. Properties like size, shape, colour, state of a substance are

A) chemical properties **B) metal properties**

C) physical properties **D) physico-chemical properties**

Answer:C

Solution: Properties like size, shape, colour, state of a substance are physical properties.These are observable characteristics without changing composition.

2. A physical change is generally

A) reversible **B) irreversible**

C) considerable **D) all of these**

Answer:A

Solution: A physical change is generally reversible

3. During a physical change, a substance undergoes a change in its

A) physical properties **B) chemical properties**

C) both (a) and (b) **D) none**

Answer:A

Solution: During a physical change, a substance undergoes a change in its physical properties.Chemical composition remains unchanged.

4. Beating of metals into sheets or drawing metals into wires.

A)temperory change **B)reversible change** **C)Physical change** **D)all**

Answer:D

Solution:Temporary (shape change isn't permanent)
Reversible (can be reworked)
Physical (no new substance forms)

5. Evoparation of water by the heat of sun .

A)Physical change **B)chemical change** **C)fast change** **D)none**

Answer:A

Solution:H_2O changes state (liquid $\rightarrow$ gas) but remains H_2O)

6. Physical change is a.

A)temporary change **B)permanent change** **C) both a & b** **D)none**

Answer:A

Solution: Physical change is a temporary change. It Can typically be reversed, unlike permanent chemical changes.

7. Which characteristic best describes a physical change?

A) Composition changes **B) Composition stays the same**

C) Form stays the same **D) Mass is lost**

Answer:B

Solution: Molecular identity unchanged

8. Melting of ice is a.

A)reversible change B)Physical change C)chemical change D)both a & b

Answer:D

Solution:Reversible (freezing reverses it)
Physical (still H_2O before/after)

9. Which among the following is a physical change?

A) Burning of wood **B) Ripening of fruit**

C) Cutting a log of wood in small pieces **D) Cooking of food**

Answer:C

Solution: In Cutting a log of wood Only size/shape changes; others involve molecular transformations

10. Changing of iron wire into a magnet involves

A) Chemical change **B) Permanent change**

C) Temporary change **D) Physical change**

Answer:C,D

Solution:When iron is magnetized, it can return to its original state when the magnetic field is removed. This indicates that the change is reversible. Since the iron retains its original composition and only its physical properties (like magnetism) are altered, this is a physical change.

11. A chemical change involves .

A)change of state only **B)change of colour only**

C)change of state as well as composition **D)none**

Answer:C

Solution:Chemical changes alter molecular structure, often with visible effects like color/state changes

12. An example of chemical change is .

A)melting of sulphur B)formation of snow C)earth quakes D)burning of coal

Answer:D

Solution:(Coal (C) + $O_2 \rightarrow CO_2 + H_2O$ + ash = new substances formed

13. During physical and chemical changes .

A)energy is always absorbed. B)energy is always released

C)no energy is absorbed or released D)energy is either absorbed or released

Answer:D

Solution: Physical: Melting (absorbs), freezing (releases)
Chemical: Combustion (releases), photosynthesis (absorbs)

14. Burning of coal is a .

A)chemical change B)physical change

C)fast change D)non periodic change

Answer:A

Solution:Burning of coal is a chemical change Irreversible; produces CO_2, ash, and energy

15. Action of heat on paraffinwax is .

A)chemical change B)permenent change C)physical change D)desirable change

Answer:C

Solution:Melting wax is reversible; no new substances form

16. Rusting of iron is a

A) physical change B) chemical change C) both (a) and (b) D) None of these

Answer:B

Solution: Rusting of iron is a chemical change
$4Fe + 3O_2 + xH_2O \rightarrow 2Fe_2O_3 \cdot xH_2O$ = new substance

17. Rusting occurs when iron is exposed to

A) oxygen and water B) soil and rain

C) breeze and sunlight D) salt water and clouds

Answer:A

Solution:Rusting occurs when iron is exposed to oxygen and water

18. When carbon dioxide is passed through lime water, the substance formed is

A) calcium oxide B) calcium carbonate C) both (a) and (b) D) none of these

Answer:B

Solution:. When CO2 is passed through lime water produce calcium carbonate
$(CO_2 + Ca(OH)_2 \rightarrow CaCO_3$ (milky) $+ H_2O$

19. A chemical change is also called a

A) chemical reaction B) rusting C) both (a) and (b) D) None of these

Answer:A

Solution:A chemical change is also called chemical reaction

JEE MAINS LEVEL QUESTIONS

1. Which of the followoing statement is correct

A) A physical change is one that changes the shape ,size,physical state,and appearance of a substance with chemical composition

B) changes which involve breaking and physical deformation might be irrevers ible under normal circumstances

C) fermentation of grapes **D) All the above**

Answer:B

Solution: Many physical changes like breaking glass or crushing rocks are indeed irreversible under normal conditions, even though they don't involve chemical changes.

2. Thermo-chromic means

A) change in colour on heating the compound

B) change in state on heating the compound

C) change in odour on heating the compound

D) All the above

Answer:A

Solution: Thermo-chromic means change in colour on heating the compound

(e.g., ZnO turns yellow when hot and white when cool)

3. "A" on heating converts to Yellow and white on cooling, the substance "A" is

A) ZnO **B) CaO** **C) $CaCO_3$** **D) $NaHCO_3$**

Answer:A

Solution:Zinc oxide turns yellow when heated and reverts to white on cooling

4. Which of the following are not physical change

A) Dissolving Salt in Water **B) Mixing Water and Oil**

C) Heating Zinc Oxide **D) None**

Answer:D

Solution:None of the options listed are not physical changes.

5. "A" burns with dazzling white light by burning and gives powdered ash. The ash formed is

A) ZnO B) CaO C) $CaCO_3$ D) MgO

Answer:D

Solution:Magnesium burns with a dazzling white flame to form white magnesium oxide ash

6. Burning of a match stick is a

A)Chemical Change B)fast change

C)irreversible change D)All the above

Answer:D

Solution:Chemical change (new substances form)

Fast change (rapid combustion)

Irreversible change (can't un-burn a match)

7. When a paper is burnt it changes to ash and smoke it is a.

A)irreversible change B)reversible change

C)Chemical change D)Both A & C

Answer:D

Solution:Burning paper to ash and smoke is Irreversible, Chemical change (C)

8. A candle on burning melts wax forms carbondioxide gas and water vapour. Which changes are observed in it

A)reversible change B)irreversible change

C)both A & B D)None

Answer:B

Solution:Wax combustion produces CO_2 + H_2O = irreversible chemical change. Melting wax alone is reversible, but the question focuses on burning.

9. Which of the following statements are correct about Chemical change

A) cannot be easily reversed

B) change in its molecular composition is observed

C) both A & B D) None

Answer:C

Solution:Correct statements about chemical changes

Cannot be easily reversed

Molecular composition changes

10. Which are common examples of chemical changes

A) Germination of seeds **B) Curdling of milk**

C) Rusting of Iron **D) All the above**

Answer:D

Solution:Germination (biochemical reactions)

Curdling (protein denaturation)

Rusting (iron oxidation)

11. What will happen if carbon dioxide gas is passed through lime water ?

A) Calcium carbonate is formed **B) The lime water turns milky**

C) Both of these **D) None of these**

Answer:C

Solution:$CO_2 + Ca(OH)_2 \rightarrow CaCO_3$ (milky) + H_2O

12. In which of the following statement are incorrect?

A) When a candle burns both physical and chemical change take place

B) Anaerobic bacteria digest animal waste and produce biogas

C) Ships suffer a lot of damage though they are not painted

D) Stretching of rubber band is not a physical change

Answer:D

Solution:Stretching is purely physical - no chemical change occurs

13. A chemical change may involve:

A) Change in colour only **B) Change in temperature only**

C) Evolution of gas only **D) All of these**

Answer:D

Solution:Color change, temperature change, and gas evolution are all possible signs

14. Suraj mother made a concentrated sugar syrup by dissolving sugar in hot water. On cooling, crystal of sugar got separated. This indicates a:

A) Physical change that can be reversed

B) Chemical change that can be reversed

C) Physical change that cannot be reversed

D) Chemical change that cannot be reversed

Answer:A

Solution:Sugar syrup crystallization Physical change that can be reversed.

15. Suraj is writing some sentences. Choose the incorrect one and help him:

A) Rusting of iron, photosynthesis and digestion of food are examples of chemical change.

B) In order to protect iron from rusting a coating of zinc is deposited on its surface.

C) Some substance cannot be obtained in pure state from their solution by crystallization.

D) None of the above.

Answer:C

Solution: Crystallization can give pure substances.

16. Which method is used to prevent rusting?

A) Galvanization B) Crystallization C) Sedimentation D) None of these

Answer:A

Solution:Zinc coating protects iron from rusting

17. Which one is a physical change?

A) Melting of ice B) Melting of wax

C) Formation of steam from water D) All the above

Answer:D

Solution:Melting ice/wax and steam formation are all state changes - physical

18. Mohan is writing some sentences, choose the sentences which is or are incorrect one:

A) When carbon dioxide is passed through lime water, it turns milky due to the formation of calcium carbonate.

B) The chemical name of baking soda is calcium carbonate.

C) Two methods by which rusting of iron can be prevented are painting and galvanization.

D) When a candle burns both physical and chemical change take place.

Answer:B

Solution:Baking soda = $NaHCO_3$; calcium carbonate = $CaCO_3$

19. Consider the following sentences which is not associated with physical change?

A) Melting of wax or butter or ghee

B) Glowing of an electric bulb or tube

C) Dissolved common salt or sugar in water

D) Growing of a seed into a plant

Answer:D

Solution:Growth involves biochemical reactions = chemical change

20. Consider the following sentences which is not associated with Chemical change?

A) Formation of a solution of soluble salt in water

B) Changing water into steam by heating

C) Ringing of an electric bell **D) All the above**

Answer:D

Solution:All are physical changes: solution formation, phase change, sound production

21. Sejal appeared in class test where he wrote some statements but he confused to know the incorrect statement. Would you help him to know that?

A) In a chemical change heat, light or both are generally given out or ab-

sorbed.

B) Iron utensils when exposed to moist air get gradually coated with reddish brown coating called rust.

C) Both A & B **D) None of the above**

Answer:D

Solution:Both A and B are correct statements about chemical changes

JEE ADVANCED LEVEL QUESTIONS

MULTIPLE CORRECT ANSWER TYPE

1. Which of the following is incorrect statement(s)

A) A physical change cannot be reversed.

B) Heat is not given off during a chemical change.

C) Burning candle doesnot give heat and light energy.

D) Rust is mainly formed due to moisture

Answer:A,B,C

Solution:A) Incorrect: Most physical changes are reversible, e.g., melting ice

B)Incorrect: Many chemical changes are exothermic, releasing heat

C) Incorrect: Combustion releases both heat and light

2. Select the correct statements regarding chemical changes:

A. Chemical changes are always accompanied by a change in energy.

B. Chemical changes involve the rearrangement of atoms.

C. Chemical changes are generally reversible.

D. Chemical changes alter the physical state of matter.

Answer:A,B

Solution:

A) True: Energy is either absorbed or released

B) True: Bonds break/form to create new substances

C) False: Most are irreversible under normal conditions

D) False: State changes can occur without chemical changes

REASON AND ASSERTION TYPE

A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

B) Both Assertion and Reason are true, but Reason is NOT the correct expla nation for Assertion.

C) Assertion is true, but Reason is false. D) Assertion is false, but Reason is true.

3. Assertion: When water is heated, it undergoes a physical change.

Reason: The temperature of water increases, causing its molecules to gain kinetic energy and move more rapidly, resulting in a change of state from liquid to gas.

Answer:A

Solution:Assertion: True (State change from liquid to gas is physical)

Reason: True (Correctly explains how heat causes state change via kinetic energy)

4. Assertion: Melting of wax is a physical change.

Reason: The wax undergoes a change in state from solid to liquid due to the absorption of heat energy, without any alteration in its chemical composition.

Answer:A

Solution:Assertion: True (State change without chemical alteration)

Reason: True (Accurately describes physical change mechanism)

5. Assertion: Cutting a piece of wood into smaller pieces is a physical change.

Reason: The cutting process involves breaking down the wood into smaller fragments without altering the chemical structure of the wood.

Answer:A

Solution:Assertion: True (Size change without chemical transformation)

Reason: True (Correctly states no chemical structure alteration)

6. Assertion: Dissolving salt in water is a physical change.

Reason: The salt molecules disperse in the water, but there is no change in the chemical composition of either the salt or water.

Answer:A

Solution:Assertion: True (Dissolution is reversible; no new substances form)

Reason: True (Ionic dispersion ? chemical change)

7. Assertion: Freezing water to form ice is a physical change.

Reason: The water molecules slow down and arrange themselves into a more structured, solid form without undergoing any chemical transformation.

Answer:A

Solution:Assertion: True (State change from liquid to solid is physical)

Reason: True (Describes molecular slowing/arrangement in freezing)

STATEMENT TYPE

8. Statement-I: Burning of candle involves both physical and chemical change

Statement-II: Physical change is due to melting of wax and chemical change is due to burning of wick

Answer:A

Solution:Physical change is due to melting of wax, and chemical change is due to combustion of wax vapor and wick.

COMPREHENSION TYPE

When a teaspoonful of vinegar is mixed with a pinch of baking soda, then a hissing sound is produced with the formation of gas. This obtained gas is called carbon dioxide gas.

9. The following chemical equation represents the following chemical change:

A) $CH_3COOH_{(aq)} + NaHCO_{3(aq)} \rightarrow CO_{2(g)} + H_2O_{(l)} + CH_3COONa_{(aq)}$

B) $CO_2 + Ca(OH)_2 \rightarrow CaCO_3 + H_2O$

C) Both A & B D) None

Answer:C

Solution:Both reactions are chemical changes

10. Baking soda is chemically called

A) Sodium Carbonate **B) Sodium Hydrogen Carbonate**

C) Acetic Acid **D) Sodium dihydrogen carbonate**

Answer:B

Solution:IUPAC name: Sodium hydrogen carbonate

Common names: Baking soda / Sodium bicarbonate

Formula: $NaHCO_3$

MATCHING TYPE

11	**a)**	**Galvanisation**	**1)**	**Promotes rusting**
	b)	**Fermentation**	**2)**	**Prevents rusting**
	c)	**Snow formation**	**3)**	**Chemical Change**
	d)	**salt in water**	**4)**	**Physical Change**

Answer:a-2,b-3,c-4,d-4

Solution:

a)	Galvanisation	2)	Prevents rusting
b)	Fermentation	3)	Chemical Change
c)	Snow formation	4)	Physical Change
d)	salt in water	4)	Physical Change

KEY

				TEACHING TASK					
			JEE MAINS LEVEL QUESTIONS						
1	2	3	4	5	6	7	8	9	10
A,C	B	A	B	A	A	D	D	C	D
11	12	13	14	15	16	17	18	19	20
A	B	B	A	B	A	C	NONE	D	A
21									
C									
			JEE ADVANCED LEVEL QUESTIONS						
1	2	3	4	5	6	7	8	9	10
C,D	A,B,C,D	A,B,C,D	A	A	A	A	A	A	D
11	12	13	14	15		16			
C	B	A		a-3,b-4,c-2,d-1		a-4,b-3,c-2,d-1			
				LEARNERS TASK					
			CONCEPTUAL UNDERSTANDING QUESTIONS						
1	2	3	4	5	6	7	8	9	10
C	A	A	D	A	A	B	D	C	C,D
11	12	13	14	15	16	17	18	19	
C	D	D	A	C	B	A	B	A	
				JEE MAINS LEVEL QUESTIONS					
1	2	3	4	5	6	7	8	9	10
B	A	A	D	D	D	D	B	C	D
11	12	13	14	15	16	17	18	19	20
C	D	D	A	C	A	D	B	D	D
21									
D									
				JEE ADVANCED LEVEL QUESTIONS					
1	2	3	4	5	6	7	8	9	10
A,B,C	A,B	A	A	A	A	A	A	C	B
11									
a-2,b-3,c-4,d-4									