* Choose the correct alternative from those given below each questions [37]

1. Which of the following observations confirms that a chemical change has occurred?
   (A) Change in shape
   (B) Formation of a new substance
   (C) Change in state
   (D) Change in colour

   Ans. : (B) Formation of a new substance

2. In which of the following cases does the change involve both physical and chemical changes?
   (A) Burning of magnesium ribbon
   (B) Melting of ice
   (C) Boiling of water
   (D) Burning of a candle

   Ans. : (D) Burning of a candle

3. What is the significance of the "ignition temperature" in combustion?
   (A) It is the temperature at which the fuel starts to burn without an external flame.
   (B) It is the temperature at which combustion stops.
   (C) It is the minimum temperature required to ignite a substance.
   (D) It is the temperature when oxygen becomes flammable.

   Ans. : (C) It is the minimum temperature required to ignite a substance.

4. Which of the following is true about rusting of iron?
   (A) It is a physical change because a new substance is not formed.
   (B) It is a chemical change because iron reacts with oxygen to form rust.
   (C) It is a physical change because iron does not lose its properties.
   (D) It is a reversible process.

   Ans. : (B) It is a chemical change because iron reacts with oxygen to form rust.

5. What would happen if you pass carbon dioxide through freshly prepared lime water?
   (A) It will turn lime water blue.
   (B) It will turn lime water milky and a white precipitate will form.
   (C) It will remain unchanged.
   (D) Lime water will dissolve the carbon dioxide.

   Ans. : (B) It will turn lime water milky and a white precipitate will form.

6. When vinegar is mixed with baking soda, the reaction produces a gas. What type of change is this?

(A) Physical change
(B) Chemical change
(C) Both physical and chemical changes
(D) None of these

Ans. : (B) Chemical change

7. Which of the following is an example of a reversible physical change?
(A) Boiling of water (B) Burning of paper (C) Melting of wax (D) Ripening of fruit

Ans. : (C) Melting of wax

8. During the combustion of magnesium, which of the following products is formed?
(A) Magnesium oxide
(B) Magnesium hydroxide
(C) Magnesium sulphide
(D) Magnesium carbonate

Ans.: (A) Magnesium oxide

9. Which of the following statements is correct regarding a chemical reaction?
(A) It involves the change of only physical properties.
(B) No new substances are formed during the reaction.
(C) Energy is always absorbed and no energy is released.
(D) New substances with different properties are formed.

Ans. : (D) New substances with different properties are formed.

10. When a piece of wood is burned, which of the following occurs?
(A) Only physical change occurs
(B) Only chemical change occurs
(C) Both physical and chemical changes occur
(D) No change occurs

Ans. : (C) Both physical and chemical changes occur

11. Which of the following indicates a physical change during the boiling of water?
(A) Formation of steam
(B) Chemical composition of water changes
(C) New substance is formed
(D) Energy is absorbed

Ans.: (A) Formation of steam

12. Which of the following is an example of a chemical change occurring in nature?
(A) Ripening of fruits
(B) Freezing of water
(C) Dissolving sugar in tea
(D) Boiling of milk

Ans.: (A) Ripening of fruits

13. Which of the following reactions can be classified as an exothermic chemical change?

(A) Freezing of water
(B) Burning of fuel
(C) Dissolving sugar in water
(D) Boiling of water

Ans. : (B) Burning of fuel

14. What type of change occurs when a piece of metal is heated and it becomes red hot?
(A) Chemical change
(B) Physical change
(C) Both physical and chemical change
(D) No change

Ans. : (B) Physical change

15. Which of the following is a physical change?
(A) Rusting of iron
(B) Burning of magnesium
(C) Melting of ice
(D) Baking of a cake

Ans. : (C) Melting of ice

16. Which of the following is a chemical change?
(A) Freezing of water
(B) Boiling of water
(C) Baking of bread
(D) Chopping vegetables

Ans. : (C) Baking of bread

17. Which of these changes can be reversed?
(A) Burning of wood (B) Melting of wax (C) Rusting of iron (D) Cooking of food

Ans. : (B) Melting of wax

18. Which of the following produces a new substance?
(A) Tearing paper
(B) Boiling water
(C) Mixing vinegar and baking soda
(D) Cutting a fruit

Ans. : (C) Mixing vinegar and baking soda

19. When you blow air into lime water, it turns milky. What does this indicate?
(A) The presence of oxygen
(B) The presence of carbon dioxide
(C) A physical change
(D) The presence of hydrogen

Ans. : (B) The presence of carbon dioxide

20. The process of turning water into steam is:
(A) A physical change
(B) A chemical change
(C) Irreversible
(D) Not a change

Ans.: (A) A physical change

21. Which of the following statements is true for a physical change?
    (A) A new substance is formed
    (B) The substance retains its original properties
    (C) Heat is always produced
    (D) A chemical reaction occurs

    Ans. : (B) The substance retains its original properties

22. What is formed when carbon dioxide is passed through lime water?
    (A) Oxygen
    (B) Calcium carbonate
    (C) Water
    (D) Calcium oxide

    Ans. : (B) Calcium carbonate

23. What happens when you mix lemon juice and baking soda?
    (A) A physical change
    (B) A chemical change
    (C) No change
    (D) Both physical and chemical changes

    Ans. : (B) A chemical change

24. The process of rusting is an example of a:
    (A) Physical change
    (B) Chemical change
    (C) Both physical and chemical change
    (D) None of these

    Ans. : (B) Chemical change

25. Which of the following is a characteristic of a chemical change?
    (A) No new substance is formed
    (B) The substance can be recovered
    (C) A new substance is formed
    (D) There is no change in the substance

    Ans. : (C) A new substance is formed

26. Which of these does not involve a chemical reaction?
    (A) Burning of magnesium
    (B) Dissolving salt in water
    (C) Digestion of food
    (D) Ripening of fruits

    Ans. : (B) Dissolving salt in water

27. When water is boiled, it changes from:

(A) Liquid to gas (B) Solid to gas (C) Gas to liquid (D) Solid to liquid

Ans.: (A) Liquid to gas

28. What happens when a candle is burnt?

(A) Only physical change occurs

(B) Only chemical change occurs

(C) Both physical and chemical changes occur

(D) No change occurs

Ans. : (C) Both physical and chemical changes occur

29. Which of the following statements are the characteristics of a physical change?

(i) The state of the substance may or may not change.

(ii) A substance with different properties is formed.

(iii) No new substance is formed.

(iv) The substance undergoes a chemical reaction.

(A) (i) and (ii) (B) (ii) and (iii) (C) (i) and (iii) (D) (iii) and (iv)

Ans. : (C) (i) and (iii)

(i) The state of the substance may or may not change – Physical changes can involve changes in state (like melting or freezing) but no new substance is formed.

(iii) No new substance is formed – In a physical change, the substance remains the same, only its form or state changes.

30. The substances which have very low ignition temperature will

(A) catch fire easily (B) will not catch fire

(C) catch fire after some time (D) none of these.

Ans.: (A) catch fire easily

31. Which of the following is rust?

(A) lime water (B) iron oxide (C) vinegar (D) baking soda

Ans. : (B) iron oxide

32. Formation of manure from leaves is a

(A) physical change

(B) chemical change

(C) both physical and chemical change

(D) none of these

Ans. : (B) chemical change

33. Which of the following is a physical change?

(A) Rusting of iron (B) Combustion of magnesium ribbon

(C) Burning of candle (D) Melting of wax

Ans. : (D) Melting of wax

34. In which type of change a new substance is formed?

(A) Physical change

(B) Chemical change

(C) Both of these

(D) None of these

Ans. : (B) Chemical change

35. Which of the following is a chemical change?

(A) Burning of paper

(B) Reaction of vinegar with baking soda

(C) Addition of carbon dioxide to lime water

(D) All of these

Ans. : (D) All of these

36. Which of the following is/are true when milk changes into curd?

(i) Its state is changed from liquid to semi solid.

(ii) It changes colour.

(iii) It changes taste.

(iv) The change cannot be reversed.

Choose the correct option from below:

(A) (i) and (ii) are correct

(B) (ii) and (iii) are correct

(C) (i), (iii) and (iv) are correct

(D) (i) to (iv) are correct

Ans. : (C) (i), (iii) and (iv) are correct

37. What is ignition temperature?

(A) The minimum temperature at which a substance catches fire.

(B) The maximum temperature at which a substance catches fire.

(C) Any temperature at which a substance catches fire.

(D) None of these.

Ans.: (A) The minimum temperature at which a substance catches fire.

*** a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.** [11]

38. Assertion (A): Burning of magnesium is a chemical change.

Reason (R): A new substance is formed when magnesium burns in air.

(A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

(B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

Ans.: (A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

39. Assertion (A): Melting of ice is a chemical change.
Reason (R): There is no new substance formed when ice melts.

(A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

(B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

Ans. : (D) (A) is false, but (R) is true.

40. Assertion (A): Rusting of iron is a physical change.
Reason (R): A new substance (rust) is formed during rusting.

(A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

(B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

Ans. : (D) (A) is false, but (R) is true.

41. Assertion (A): The process of burning paper is a physical change.
Reason (R): When paper burns, it produces heat and light.

(A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

(B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

Ans. : (D) (A) is false, but (R) is true.

42. Assertion (A): Freezing water is a chemical change.
Reason (R): Water changes its state from liquid to solid when frozen.

(A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

(B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

Ans. : (D) (A) is false, but (R) is true.

43. Assertion (A): Combustion is a physical change.
Reason (R): A new substance is formed during this process.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A

(C) A is true but R is false.

(D) A is false but R is true.

Ans. : self

44. Assertion (A): Burning of a candle is a physical change.
Reason (R): The products formed by burning a candle cannot be easily converted back to original candle.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

Ans. : (D) A is false but R is true.

45. Assertion (A): Carbon dioxide gas supports combustion.
Reason (R): Wood, cotton, paper and kerosene are the examples of combustible substances.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

Ans. : (D) A is false but R is true.

46. Assertion (A): Change of water from liquid to steam on heating is a physical change.
Reason (R): The state of water during heating remains the same and the change involves a change in composition.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

Ans. : (C) A is true but R is false.

47. Assertion (A): Formation of rust is a chemical change.
Reason (R): For the formation of rust, iron must be exposed to air and water.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

Ans. : (B) Both A and R are true but R is not the correct explanation of A.

48. Assertion (A): Erosion is a chemical change.
Reason (R): During erosion, natural forces like wind and flowing water breaks down the rocks to form soil.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

Ans. : (D) A is false but R is true.

*** State Whether The Following Sentences Are True Or False.[1 Marks Each]** **[17]**

49. The melting of ice is a chemical change.

Ans. : false

50. Cutting vegetables is a physical change.

Ans. : true

51. Rusting of iron is a physical change.

Ans. : false

52. Combustion is a chemical change.

Ans. : true

53. Boiling water results in a chemical change.

Ans. : false

54. The process of making curd from milk is a chemical change.

Ans. : true

55. Crushing a chalk piece is a physical change.

Ans. : true

56. The rusting of iron is reversible.

Ans. : false

57. Melting of wax is necessary for burning a candle.

Ans. : true

58. Collecting water vapour by condensing involves a chemical change.

Ans. : false : collecting water vapour by condensing involves a physical change.

59. The process of converting leaves into compost is a chemical change.

Ans. : true

60. Mixing baking soda with lemon juice is a chemical change.

Ans. : true

61. Cooking of rice is a physical change.

Ans. : false

62. Formation of clouds is a reversible change.

Ans. : true

63. In physical changes, new substances are formed.

Ans. : false

64. Burning of candle involves physical change only.

Ans. : false

65. Combustion occurs in presence of carbon dioxide.

Ans. : false

*** Fill In The Blanks With Correct Alternative.[1 Marks Each]** [13]

66. Nalini observed that the handle of her cycle has got brown deposits. The brown deposits are due to _____ and this is a _____ change.

Ans. : rusting,chemical

67. Folding a handkerchief is a _____ change and can be _____ .

Ans. : physical,reversed

68. A chemical process in which a substance reacts with oxygen with evolution of heat is called _____ and this is a _____ change.

Ans. : combustion,chemical

69. Magnesium, when burnt in air, produces a substance called _____ . The substance formed is _____ in nature.

Ans. : magnesium oxide,basic

70. The rusting of iron is an example of a _____ change.

Ans. : chemical

71. The process of burning a candle involves both _____ and _____ changes.

Ans. : physical,chemical

72. Nalini observed that the handle of her cycle has got brown deposits. The brown deposits are due to _____ and this is a _____ change.

Ans. : rusting, chemical

73. Melting of ice is a _____ change.

Ans. : physical

74. Formation of curd from milk is a _____ change.

Ans. : chemical

75. Making sugar solution is a _____ change.

Ans. : physical

76. Grinding of wheat grain changes its size. It is a _____ change.

Ans. : physical

77. Burning of paper is a _____ change.

Ans. : chemical

78. The lowest temperature at which a substance catches fire is called its _____ temperature.

Ans. : ignition

*** Answer The Following Questions In One Sentence.[1 Marks Each]** **[57]**

79. How can you test the presence of carbon dioxide?

Ans. : To test for the presence of carbon dioxide gas, we can pass the gas through lime water. If carbon dioxide is present, the lime water will turn milky.

80. What is the significance of the turning of lime water milky during a chemical reaction?

Ans. : The turning of lime water milky indicates the presence of carbon dioxide, which confirms a chemical reaction has taken place.

81. What happens when magnesium is burnt in air?

Ans. : Magnesium, when burnt in air, produces a substance called magnesium oxide.

82. Give an example of a chemical change in daily life.

Ans. : When you cook an egg, the heat causes the proteins in the egg to change their structure, resulting in a different texture and appearance. You cannot reverse this process to get back the raw egg.

83. What happens when you heat water in an open pan?

Ans. : When you heat water in an open pan, it boils and turns into steam.

84. Can a chemical change be reversed? Give an example.

Ans. : No, a chemical change is generally not easily reversible.
Example, burning paper cannot be turned back into its original form.

85. What is combustion?

Ans. : Combustion is a chemical reaction where a substance reacts with oxygen to produce heat and/or light.

86. Predict the following change can be reversed or not be reversed. If you are not sure, you may write that down. Why are you not sure about these?
Stitching cloth to a shirt

Ans. : Stitching cloth to a shirt - cannot be reversed: Once stithed, it is hard to undo without damage.

87. Predict the following change can be reversed or not be reversed. If you are not sure, you may write that down. Why are you not sure about these?
Twisting of straight string

Ans. : Twisting of straight string – Can be reversed: The string can be untwisted.

88. Predict the following change can be reversed or not be reversed. If you are not sure, you may write that down. Why are you not sure about these?
Making idlis from a batter

Ans. : Making idlis from a batter – Cannot be reversed: The batter cannot be returned to its original form after steaming.

89. Predict the following change can be reversed or not be reversed. If you are not sure, you may write that down. Why are you not sure about these?
Dissolving sugar in water

Ans. : Dissolving sugar in water – Can be reversed: Sugar can be recovered by evaporating water.

90. Predict the following change can be reversed or not be reversed. If you are not sure, you may write that down. Why are you not sure about these?
Drawing water from a well

Ans. : Drawing water from a well – Can be reversed: Water can be returned to the well.

91. Predict the following change can be reversed or not be reversed. If you are not sure, you may write that down. Why are you not sure about these?
Ripening of fruits

Ans. : Ripening of fruits – Cannot be reversed: Once ripe, fruits cannot go back to unripe.

92. Predict the following change can be reversed or not be reversed. If you are not sure, you may write that down. Why are you not sure about these?
Boiling water in an open pan

Ans. : Boiling water in an open pan – Can be reversed: Evaporated water can be obtained back by condensation.

93. Predict the following change can be reversed or not be reversed. If you are not sure, you may write that down. Why are you not sure about these?
Rolling up a mat

Ans. : Rolling up a mat – Can be reversed: The mat can be unrolled.

94. Predict the following change can be reversed or not be reversed. If you are not sure, you may write that down. Why are you not sure about these?
Grinding wheat grains to flour

Ans. : Grinding wheat grains to flour – Cannot be reversed: Flour cannot be turned back into grains.

95. Predict the following change can be reversed or not be reversed. If you are not sure, you may write that down. Why are you not sure about these?
Forming of soil from rocks

Ans. : Forming of soil from rocks – Cannot be reversed: Soil formation is a slow process and cannot form rock back.

96. Is curdling of milk a physical or chemical change? Justify your statement.

Ans. : The curdling of milk is a chemical change because, during this process, milk reacts with acid or bacteria, forming new substances like curd. This change cannot be reversed, which makes it a chemical change.

97. Changes listed in A, B and C are as follows :
A. Creating some objects with paper: When we create different objects like aeroplane, boat, bird, etc. by folding a sheet of paper, only shape and size changes. We can get back the original sheet by unfolding it again.
B. Playing with a balloon: When we loosen the grip of the inflated balloon we get the original shape of balloon back, and we can inflate it again but when we prick the inflated balloon with a pin, it gets deflated with a hole in it, so we cannot able to inflate it again.
C. Crushing a piece of chalk: When we crushed a piece of chalk to powder form, we cannot can get back the original piece of a chalk.

Ans. : Observation and conclusion: In all these types of changes, material (piece of paper, balloon, chalk) remains the same but their size and shape changes only. Thus, these are examples of physical changes.

98. What are the two main kinds of changes?

Ans. : There are two kinds of changes:
(i) Physical changes
(ii) Chemical changes

99. If you cut off a paper into various pieces, is there any change in the property of the paper?

Ans. : No, there is no change in the chemical property of paper.

100. Melting of wax is a change where a solid changes to liquid state. Give one more such change which you observe in your surroundings.

Ans. : Melting of ice cubes or melting of ice cream.

101. What do you mean by rusting?

Ans. : The process of formation of rust on iron is called rusting.

102. Name the gas released when baking soda is mixed with vinegar.

Ans. : Carbon dioxide

103. What happens when carbon dioxide is passed through lime water? Write the equation of the reaction.

Ans. : Lime water becomes milky due to formation of calcium carbonate.

$$\underset{(\text{Calcium hydroxide})}{\text{Lime water}} + \text{Carbon dioxide} \rightarrow \underset{(\text{insoluble substance})}{\text{Calcium carbonate}}$$

104. Define combustion.

Ans. : A chemical reaction in which a substance reacts with oxygen and produces heat and/ or light is called combustion.

105. Define the term bioluminescence.

Ans. : Some insects like fireflies emit light in late evenings, which is produced by a chemical change. This type of light production (without heat) in living organisms is called bioluminescence.

106. What happens when we add beetroot extract to water?

Ans. : Colour of water changes to pink.

107. Melting of butter is reversible or irreversible change?

Ans. : Reversible change

108. What are physical properties?

Ans. : The properties such as shape, size, colour and state of a substance, that can be observed are called physical properties.

109. What is chemical change?

Ans. : A change in which one or more new substances are formed is called chemical change. A chemical change is caused by a chemical reaction. For example, formation of curd from milk, burning of paper, etc.

110. List conditions under which combustion can take place.

Ans. : Conditions necessary for combustion are:

1. Presence of a combustible substance.
2. Attainment of ignition temperature.
3. Proper supply of air to provide oxygen.

111. What are combustible substances? Give two examples.

Ans. : The substances that undergo combustion reaction are called combustible substances. For example, paper, kerosene.

112. The gas we use in the kitchen is called liquefied petroleum gas (LPG). In the cylinder it exists as a liquid. When it comes out from the cylinder it becomes a gas (Change-A) then it bums (Change-B). Identify change A and change B.

Ans. : (i) Change-A is a physical change.
(ii) Change-B is a chemical change.

113. Give two examples for each of the following cases:
(a) Physical changes which are reversible.
(b) Physical changes which are not reversible.
(c) Chemical changes.

Ans. : (a) Dissolving sugar in water, folding of paper
(b) Tearing of paper, cutting of wood
(c) Cooking of food, burning of wood

114. What type of change is called in which new substance with new properties is formed?

Ans. : Chemical change

115. Combustion, cooking, and rusting are chemical changes, justify the statement.

Ans. : In all these processes, new substances are being formed.

116. Give two examples of a chemical change.

Ans. : (i) Rusting of iron
(ii) Curdling of milk

117. What is the colour of flame when magnesium ribbon is burnt?

Ans. : White colour

118. During rusting, which new substance is formed?

Ans. : Iron oxide

119. Define ignition temperature.

Ans. : The minimum temperature of a substance at which it catches fire is called its ignition temperature.

120. When baking soda is mixed with vinegar then a gas is released. Name the gas.

Ans. : Carbon dioxide

121. What is the colour of rust?

Ans. : Reddish brown colour

122. Gives examples of natural slow changes.

Ans. : Weathering of rocks and erosion

123. Name two desirable changes.

Ans. : Formation of curd or paneer from milk, decomposition of food waste into compost.

124. Note the changes in shape, size or state : Melting ice cubes

Ans. : Observation(s) : Ice melts to water, state changes

125. Note the changes in shape, size or state : Chopping vegetables

Ans. : Observation(s) : Size and shape changes

126. Note the changes in shape, size or state : Boiling water

Ans. : Observation(s) : Water changes to water vapour, state changes

127. Note the changes in shape, size or state : Making popcorn from corn

Ans. : Observation(s) : Corns get roasted into bigger size popcorns (new substance formed), shape and size changes

128. Note the changes in shape, size or state : Cutting a piece of paper

Ans. : Observation(s) : Shapes and sizes changes

129. Note the changes in shape, size or state : Adding beetroot extract to water

Ans. : Observation(s) : Colour of water changes to pink

130. Note the changes in shape, size or state : Burning wood

Ans. : Observation(s) : Wood changes to ash (new substance formed), heat and light produced

131. Note the changes in shape, size or state : Drying wet clothes

Ans. : Observation(s) : Water from wet clothes gets evaporated, state of water changes from liquid to gas

132. Note the changes in shape, size or state : Making small balls of dough

Ans. : Observation(s) : Shapes and sizes changes

133. Note the changes in shape, size or state : Rolling small balls of dough into chapatis

Ans. : Observation(s) : Shapes and sizes changes

134. Note the changes in shape, size or state : Cooking of food

Ans. : Observation(s) : Composition, smell and taste changes

135. Note the changes in shape, size or state : Making pot from mud

Ans. : Observation(s) : Shapes and sizes changes

*** consists of questions of 2 marks each.** **[88]**

136. What is a physical change? Give two examples.

Ans. : A physical change alters the form or appearance of a substance but doesn't change it into a new substance.

Example:

(i) Melting ice

(ii) Chopping vegetables.

137. How is rusting of iron a chemical change? Explain with an example.

Ans. : Rusting of iron is a chemical change because it involves the formation of a new substance (rust) with different properties than the original iron.

138. What happens when a candle is burnt? Explain the physical and chemical changes involved.

Ans. : Burning a candle involves both physical and chemical changes.

→ Physically, the wax melts (state change) due to the heat, and this melted wax can solidify again if cooled.

→ Chemically, the wax undergoes combustion, reacting with oxygen to produce carbon dioxide and water vapor (new substances), releasing heat and light. This combustion is irreversible.

139. How does the process of making curd from milk illustrate a chemical change?

Ans. : The making of curd from milk exemplifies a chemical change because it involves the transformation of milk into a new substance with different properties. During curdling, bacteria convert lactose (milk sugar) into lactic acid, resulting in a change in taste, texture, and acidity. This conversion indicates a chemical reaction, making curd formation a chemical change.

140. What happens when you mix vinegar with baking soda? Explain the change.

Ans. : → Mixing vinegar and baking soda leads to a chemical change that produces new substances.

→ The reaction releases carbon dioxide gas, which you see as bubbles. Additionally, other new substances are formed, indicating that the original compounds have been transformed into something new.

141. If you mix two substances, A and B, and they undergo a change to form a new substance, how can you confirm if it is a chemical change?

Ans. : To confirm if a change is chemical, check for indicators like gas evolution, color change, heat production, or precipitate formation.

If mixing substances A and B results in a new substance with significantly different properties (like a new color, gas, or solid), and the change is not easily reversible, it indicates a chemical reaction. These signs suggest that new chemical bonds have formed.

142. Can a physical change have harmful effects? Explain with examples.

Ans. : Yes, physical changes can have harmful effects.

Example: The increased consumption of fuels in cars and airplanes leads to a rise in carbon dioxide levels in the atmosphere, contributing to climate change. Similarly, the drying of paint on walls and furniture releases substances through evaporation, causing atmospheric pollution.

143. How can changes in the environment affect natural processes like erosion and weathering?

Ans. : Changes in the environment, such as temperature fluctuations and the presence of water or chemicals, can significantly impact natural processes like erosion and weathering. Temperature changes can cause rocks to break apart, while water and chemicals can react with rocks, leading to their decomposition. These processes contribute to the formation of soil and the shaping of landscapes over time.

144. How would you prevent rusting in iron objects? Discuss with relevant chemical reactions.

Ans. :

To prevent rusting in iron objects, create a barrier between the iron, oxygen, and water.

This can be achieved through methods like painting, coating with oil or grease, or galvanizing (coating with zinc).

Example: galvanization works because zinc corrodes preferentially, protecting the iron.

Chemically, the main reaction for rusting is:

$4Fe + 3O_2 + 6H_2O \rightarrow 4Fe(OH)_3$

145. If you have a burning candle and you cover it with a glass, what happens to the flame? Explain using scientific reasoning.

Ans. : When a burning candle is covered with a glass, the flame will eventually extinguish due to the consumption of oxygen.

Combustion requires oxygen to sustain the burning process. As the candle burns inside the closed glass, it uses up the available oxygen. Once the oxygen level drops below a critical point, the flame can no longer be supported, and the candle goes out. This demonstrates that oxygen is essential for combustion.

146. Can you think of a way to reverse the chemical changes that occur during cooking? Explain.

Ans. : Generally, the chemical changes that occur during cooking are difficult to reverse.

Example: when you bake a cake, the ingredients undergo chemical reactions to form new substances with different properties. It is not possible to return the cake back to its original raw ingredients.

147. How would you identify whether a change is physical or chemical during an experiment?

Ans. :

→ To distinguish between physical and chemical changes during an experiment, focus on the composition of the substance before and after the change.

→ If the substance remains the same chemically, only altering its appearance or state (like melting ice), it's a physical change. However, if a new substance with different properties is formed (such as burning wood and creating ash), it indicates a chemical change has occurred. Observing signs like gas production, color change, or heat release can also confirm a chemical change.

148. The image shows a piece of magnesium ribbon being burnt in the air.

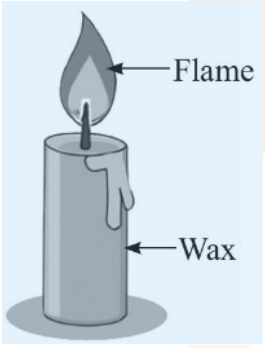
Image

(a) Describe the changes that occur when magnesium is burnt in air. What type of change is involved, and what are the products formed?

(b) Explain the importance of such reactions in daily life. Where are these reactions used, and why are they significant?

Ans. : self

149. An image depicts a candle being lit. The wax of the candle is melting and evaporating to form a flame, with the wick burning and producing light and heat.



(a) Explain the physical and chemical changes occurring when a candle burns. What happens to the wax, and what is produced during combustion?

(b) If you cover the candle with a glass jar, the flame will eventually go out. What causes this, and what does this tell you about the requirements for combustion?

Ans. : self

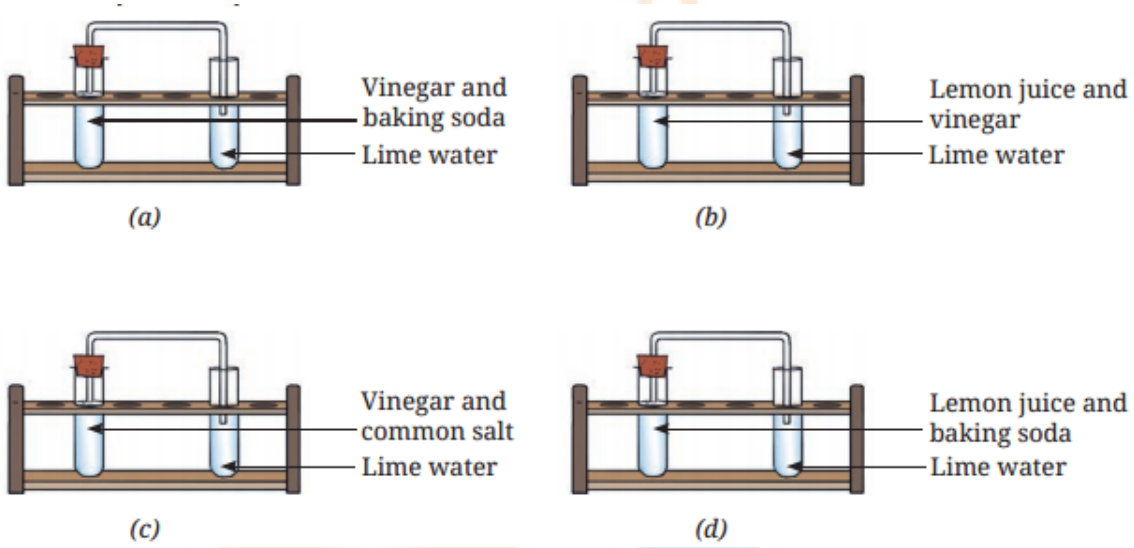
150. Are the changes of water to ice and water to steam, physical or chemical? Explain

Ans. : Both, the change of water to ice and water to steam are physical changes. In both processes, the chemical composition of water remains the same; only its state changes from liquid to solid (ice) or from liquid to gas (steam). No new substance is formed which is a characteristic of physical changes.

151. Natural factors, such as wind, rain, etc., help in the formation of soil from rocks. Is this change physical or chemical and why?

Ans. : The formation of soil from rocks involves both physical and chemical changes. Natural factors like wind, rain and temperature break down rocks into smaller pieces (physical change), while chemical processes, like weathering, also change the minerals in the rocks (chemical change). Both types of changes work together to form soil.

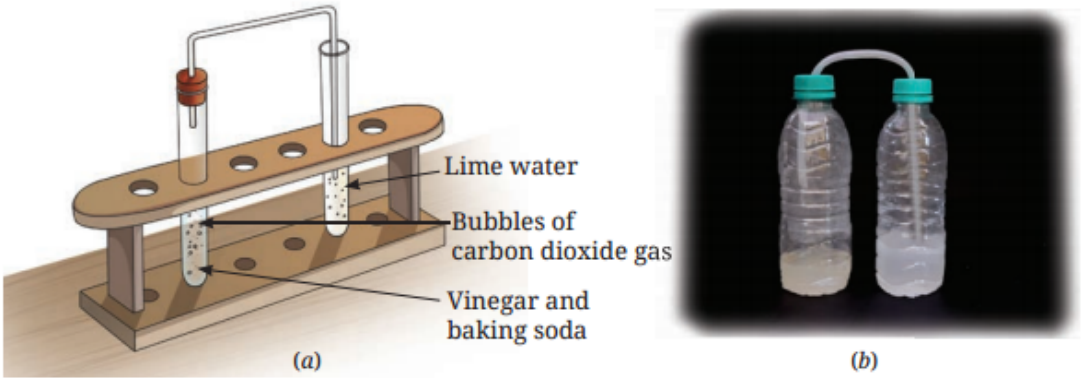
152. The experiments shown in Fig. a, b, c, and d were performed. Find out in which case(s) did lime water turn milky and why?



Ans. : In Figure (a), when vinegar reacts with baking soda, carbon dioxide gas is released. This carbon dioxide gas travels through the straw into the test tube with lime water, where it reacts to form calcium carbonate, a white solid substance that makes the lime water appear milky.

$$\text{Carbon dioxide} + \underset{\text{(Calcium hydroxide)}}{\text{Lime water}} \rightarrow \underset{\text{(White insoluble substance)}}{\text{Calcium carbonate}} + \text{Water}$$

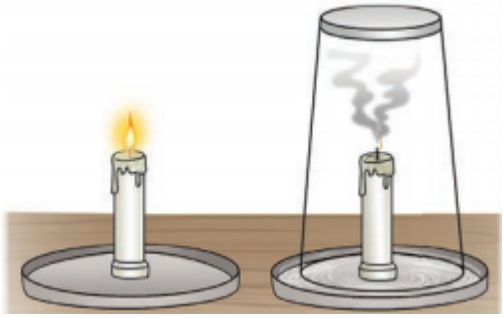
153. Observe the figure :



Ans. : Observation and conclusion: When we add a pinch of baking soda (sodium hydrogen carbonate) to vinegar or lemon juice, bubbles of carbon dioxide gas are produced with a fizzing sound. When we pass this gas to lime water, it turns milky. Thus, in this process, new substances are formed, it is a chemical change.

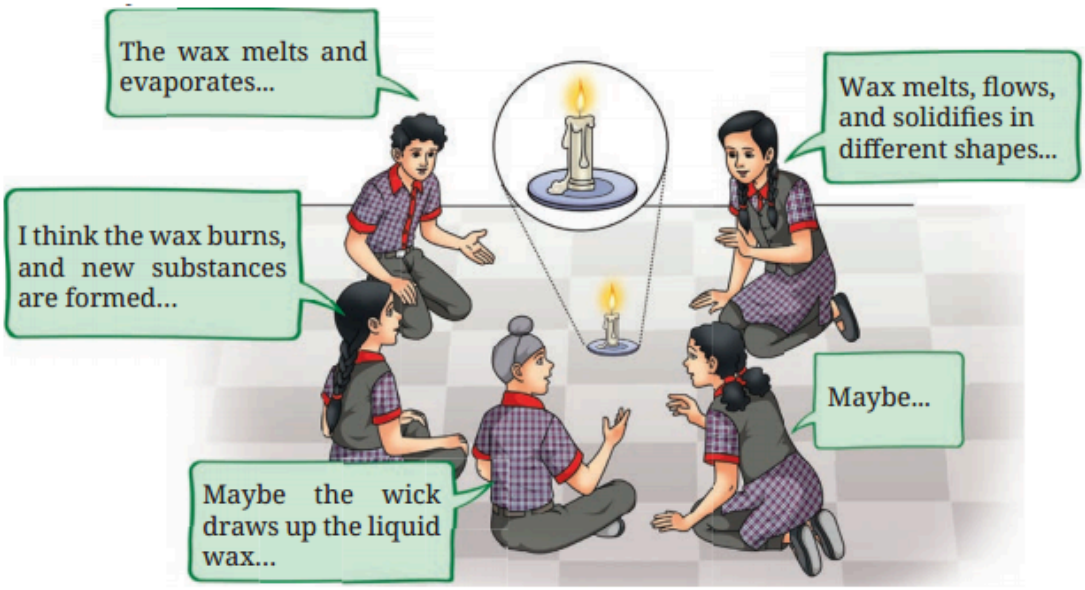
Vinegar + Baking soda $\rightarrow$ Carbon dioxide + Other substances

154. Observe the figure :



Ans. : Observation and conclusion: In figure (a), candle keeps on burning as it is not covered and supply of air (oxygen) is available. But in figure (b), as candle is covered with a glass tumbler, does not get a continuous supply of air, so, it gets extinguished. This concludes oxygen is required for combustion.

155. Observe the figure :

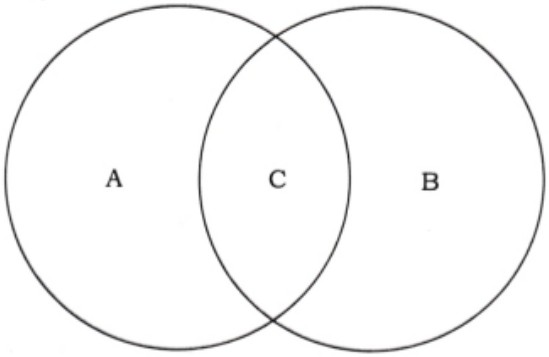


Ans. : Conclusion: Burning of a candle involves both physical and chemical change. Melting of wax, evaporation of wax to wax vapour and solidification of melted wax to solid wax are all physical changes. While burning of wax to produce new substance, carbon dioxide is a chemical change.

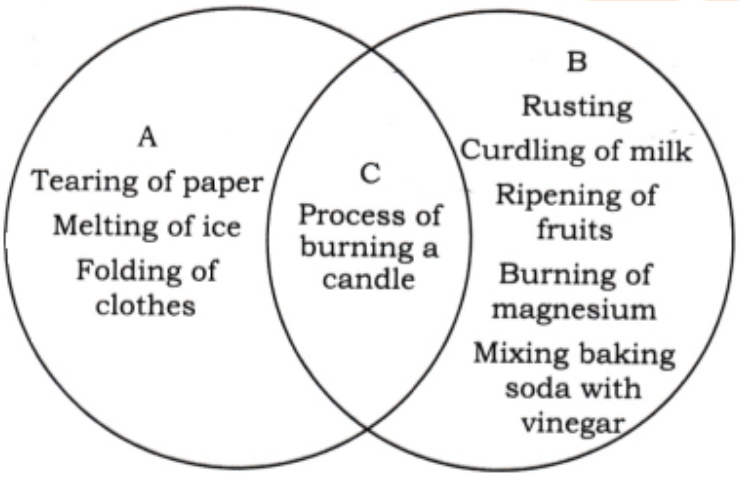
156. Some changes are given here. Write physical changes in the area marked 'A' and chemical changes in the area marked 'B'. Enter the changes which are both physical and chemical in the area marked 'C

Process of burning a candle; Tearing of paper; Rusting; Curdling of milk; Ripening of fruits; Melting of ice; Folding of clothes; Burning of magnesium and Mixing

baking soda with vinegar.



Ans. :



157. What are physical changes?

Ans. : The changes in which a substance undergoes a change in its physical properties are called physical changes.

Physical changes are generally reversible. In such changes, no new substances are formed. For example, melting of ice, formation of steam, etc.

158. Explain the activity of burning of magnesium ribbon. Represent the change by an equation.

Ans. : Get a small and thin strip or ribbon of magnesium. Clean its tip with sand paper. Bring the tip near a candle flame. It burns with a brilliant white light. After combustion white powdery ash is left, it is called magnesium oxide.

159. Explain the following:

(a) Lime water turns milky on passing carbon dioxide gas into it.

(b) Bubbles are produced when acetic acid is added to a solution of sodium hydrogen carbonate.

Ans. : (a) On passing carbon dioxide gas through lime water, the lime water turns milky due to the formation of a white coloured insoluble calcium carbonate.

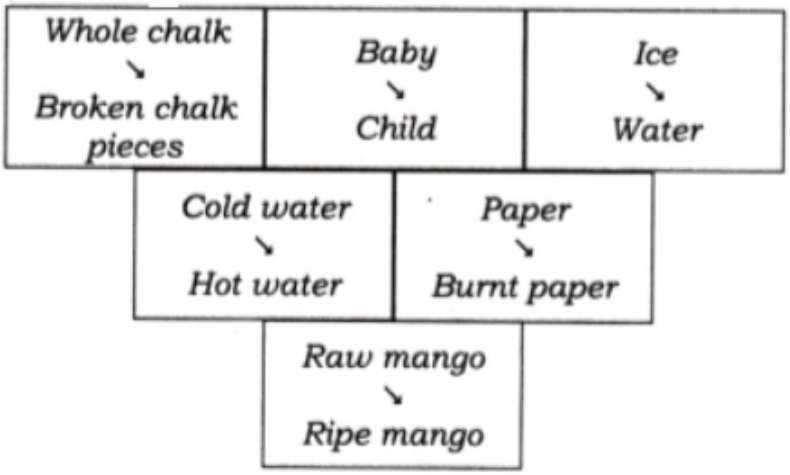
(b) Bubbles are produced when acetic acid is added to a solution of sodium hydrogen carbonate due to the formation of carbon dioxide gas.

160. Write the characteristics of a chemical change.

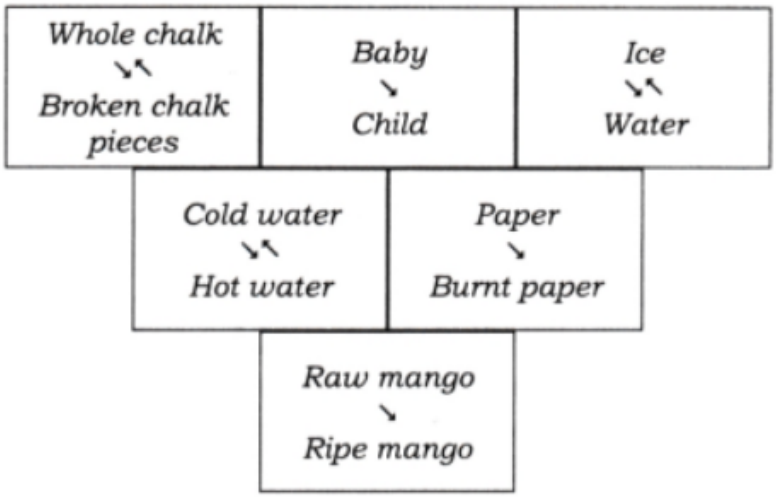
Ans. : Characteristics of a chemical change:

1. Mostly chemical reactions are irreversible.
2. They cause release or absorption of energy.
3. New substances with new properties are formed.
4. The properties of reactants are different from the products.

161. Select the chemical or physical changes which are reversible by putting reverse arrow in the following boxes:



Ans. :



162. What is rust?

Ans. : Rust is a reddish-brown substance formed when iron reacts with oxygen and moisture in the air.

163. Give two examples of physical changes.

Ans. : Two examples of physical changes are melting of ice and dissolving sugar in water.

164. Making popcorns from corns is what type of change?

Ans. : Making popcorns from corns is a chemical and irreversible change because new substances are formed and it cannot be reversed.

165. Why lime water turns milky on passing carbon dioxide gas to it?

Ans. : Lime water turns milky when carbon dioxide gas is passed through it because carbon dioxide reacts with lime water to form insoluble calcium carbonate, which makes the solution appear milky.

166. Define ignition temperature.

Ans. : Ignition temperature is the minimum temperature at which a substance starts burning in air.

167. When baking soda is mixed with lemon juice, bubbles are formed with the evolution of a gas. What type of change is it? Explain

Ans. : It is a chemical change because carbon dioxide gas is produced and new substances are formed.

168. Burning of candle involves both physical and chemical change. Justify this statement.

Ans. : The burning of a candle involves both physical and chemical changes because the melting of wax is a physical change, while the burning of wax produces new substances like carbon dioxide and water vapour, which is a chemical change.

169. Define the term 'bioluminescence'. Give one example.

Ans. : Bioluminescence is the ability of living organisms to produce light by a chemical reaction within their bodies.
An example of bioluminescence is the glow produced by fireflies.

170. Explain why burning of wood and cutting it into small pieces are considered as two different types of changes.

Ans. : Burning of wood is a chemical change because new substances like ash and gases are formed and it is irreversible.
Cutting wood into small pieces is a physical change because only the size changes and no new substance is formed.

171. Classify the following changes into physical change, chemical change, reversible change or irreversible change.
(i) Folding of paper to make a boat.
(ii) Cooking chapati from wheat flour.

Ans. : (i) Folding of paper to make a boat is a physical and reversible change because only the shape of the paper changes and it can be unfolded back.
(ii) Cooking chapati from wheat flour is a chemical and irreversible change because new substances are formed and the original flour cannot be obtained again.

172. Classify the changes involved in the following processes as physical or chemical changes:
(a) Photosynthesis
(b) Dissolving sugar in water

(c) Burning of coal
(d) Melting of wax
(e) Beating aluminium to make aluminium foil
(f) Digestion of food

Ans. : (a) Photosynthesis is a chemical change because new substances like glucose and oxygen are formed.
(b) Dissolving sugar in water is a physical change because no new substance is formed and sugar can be recovered.
(c) Burning of coal is a chemical change because new substances like carbon dioxide and ash are produced.
(d) Melting of wax is a physical change because only the state of wax changes and no new substance is formed.
(e) Beating aluminium to make aluminium foil is a physical change because only the shape of aluminium changes.
(f) Digestion of food is a chemical change because food is converted into new substances.

173. Setting of curd from milk is a chemical change. Explain.

Ans. : Setting of curd from milk is a chemical change because new substances are formed and milk cannot be obtained again from curd.

174. Give two examples each of natural slow change and desirable change.

Ans. :
Two examples of natural slow changes are rusting of iron and growth of plants.
Two examples of desirable changes are cooking of food and setting of cement.

175. Burning of crackers is a chemical change. Justify the given statement.

Ans. : The burning of crackers is a chemical change because new substances are formed along with heat, light, and sound, and the change is irreversible.

176. When a candle burns, both physical and chemical changes take place. Identify these changes. Give another example of a familiar process in which both the chemical and physical changes take place.

Ans. : Melting of wax is a physical change and burning of wax is a chemical change when a candle burns.
Another example is burning of LPG gas, where gas burning is a chemical change and melting of solid impurities is a physical change.

177. Explain the process of weathering of rocks and how it involves both physical and chemical changes.

Ans. :
Weathering of rocks is the slow breaking down of rocks into smaller pieces by natural forces like wind, water, and temperature changes.

It involves physical changes when rocks break into smaller pieces and chemical changes when minerals in rocks react with air and water.

178. Define combustion. What are the prerequisite conditions for the combustion reaction to occur.

Ans. : Combustion is a chemical process in which a substance reacts with oxygen to produce heat and usually light.
The prerequisite conditions for combustion to occur are the presence of a combustible substance, sufficient supply of oxygen, and a suitable ignition temperature.

179. Most of the physical changes are reversible. Give some examples with reasons.

Ans. : Melting of ice into water is a reversible physical change because water can be frozen back into ice.
Inflating and deflating a balloon is also reversible because no new substance is formed.

*** consists of questions of 3 marks each.** **[45]**

180. Read the passage and answer the questions :
You are conducting an experiment where you add vinegar to baking soda. As soon as the two substances mix, there is a fizzing sound, and bubbles of gas begin to form, pass this gas through freshly prepared lime water. You observe that the lime water has turned milky due to formation of a precipitate.
Q.1. What type of change has occurred in this experiment?
(a) Physical change
(b) Chemical change
(c) Both physical and chemical change
(d) No change
Q.2. What is the gas that has been produced in this reaction?
(a) Oxygen (b) Nitrogen
(c) Carbon dioxide (d) Hydrogen
Q.3. What is the name of the white precipitate that forms in the solution?
(a) Calcium hydroxide
(b) Calcium carbonate
(c) Sodium bicarbonate
(d) Magnesium oxide

Ans. : (b) Chemical change
(c) Carbon dioxide
(b) Calcium carbonate

181. Create a collage of natural changes that include both physical and chemical changes, such as the melting of ice, the rusting of metals, the decay of food, and the growing of plants.

Ans. : self

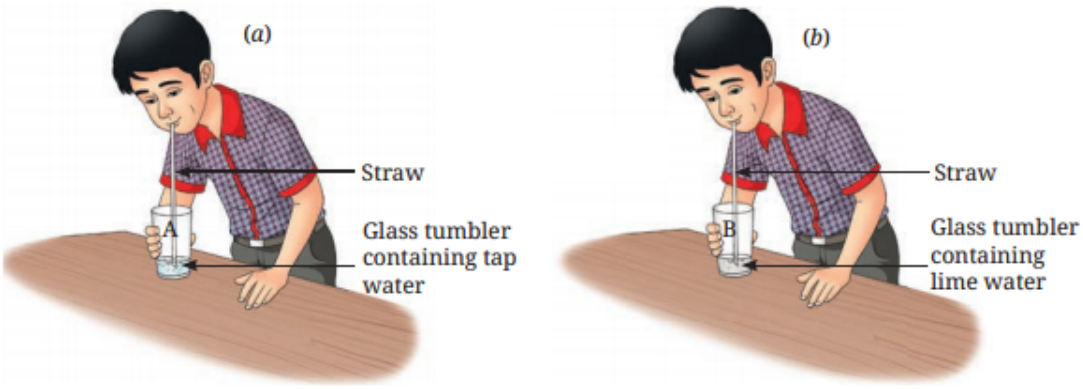
182. Research famous scientists (e.g., Marie Curie, Antoine Lavoisier) and their contributions to the understanding of chemical reactions and changes. Create a timeline or a presentation about the history of chemical discoveries.

Ans. : self

183. Draw a pictorial presentation of the process of rusting and explain the chemical changes involved.

Ans. : self

184. Observe the figure :



Ans. : Observation and conclusion: When we blow air (carbon dioxide) from mouth to tumbler A containing water, we do not observe any change in the colour of water. But when we blow air into tumbler B containing lime water (calcium hydroxide), lime water turns milky and white-coloured insoluble substance (calcium carbonate) gets settle down. Thus, this is classified as chemical change as new substance is being formed.

$$\text{Carbon dioxide} + \underset{\text{(calcium hydroxide)}}{\text{Lime water}} \rightarrow \underset{\text{carbonate (milky)}}{\text{Calcium}} + \text{water}$$

185. Observe the figure :

Fig. (a): Focusing the sunrays using a magnifying glass

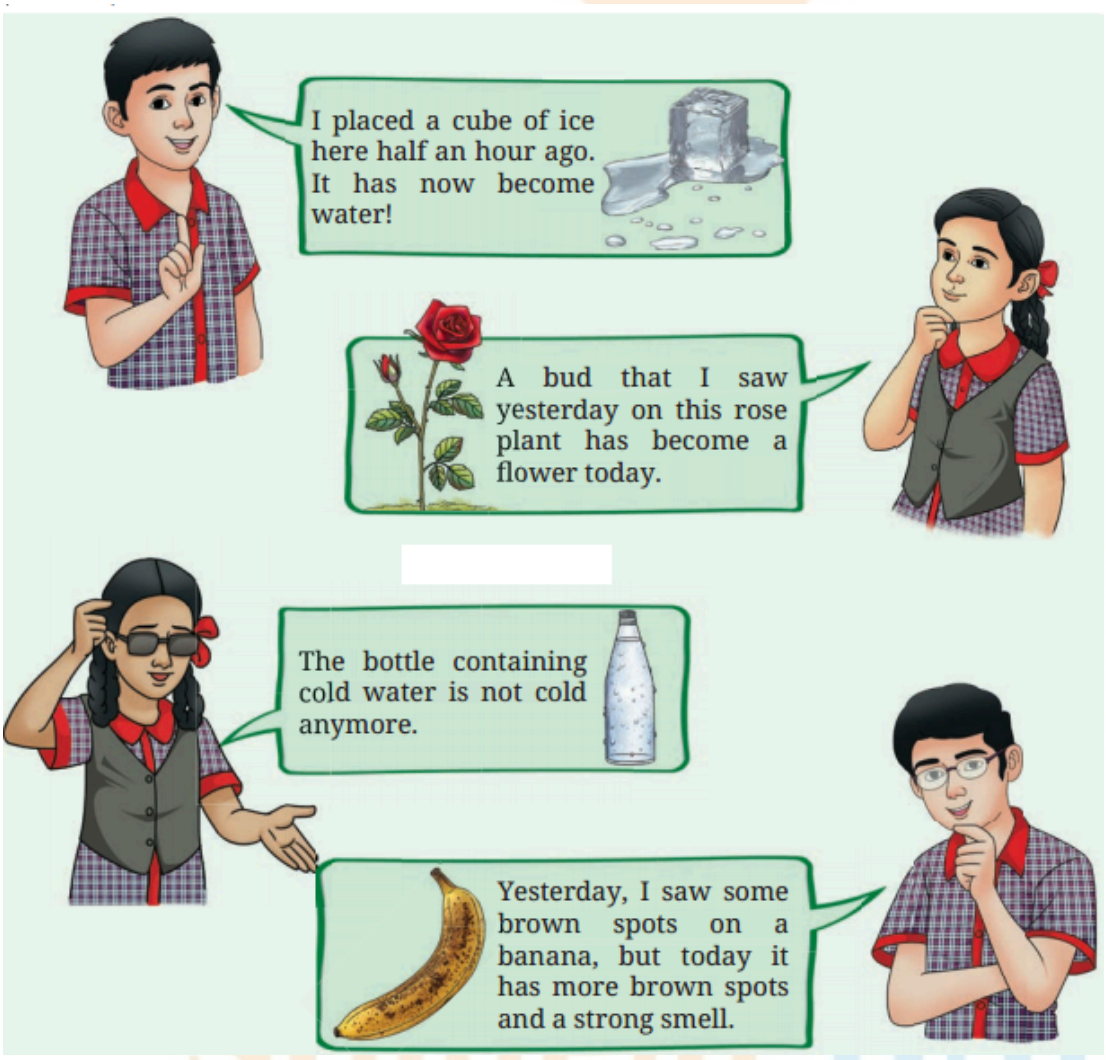
Fig. (b): Paper catching fire

Ans. : Observation and conclusion: The substance catches fire only when its ignition temperature is reached. Ignition temperature is the minimum temperature at which the substance catches fire. When a lighted matchstick is brought near to the paper it catches fire immediately because the temperature of the matchstick is already higher that the ignition temperature of the paper. In another case, when sunrays are focused using a magnifying glass on a piece of paper, it gets heated up and the temperature of paper increases and it attains its ignition temperature and starts burning and emit smoke.

Requirements for combustion process to occur :

1. A combustible substance (fuel)
2. Oxygen
3. Attainment of ignition temperature.

186.



These students are describing some changes. What kinds of changes are they talking about?

Ans. : 1. Ice melts and becomes water. This is physical change as only state of water from solid to liquid has changed in this process.

2. Bud blossoms to a flower, this is a chemical change as once a bud blooms into a

flower, it cannot revert back to its bud form. Also, internal chemical changes takes place.

3. Cold water becomes warm on keeping in open, this is a physical change as water remains the same, only its temperature changes.

4. Rotting of banana is a chemical change as its composition and texture get changed.

187. Read the following story titled 'Eco-friendly Prithin', and tick the most appropriate option(s) given in the brackets. Provide a suitable title of your choice for the story.
Prithvi is preparing a meal in the kitchen. He chops vegetables, peels potatoes, and cuts fruits (physical changes/chemical changes). He collects the seeds, fruits, and vegetable peels into a clay pot (physical change/ chemical change). The fruits, vegetable peels, and other materials begin to decompose due to the action of bacteria and fungi, forming compost (physical change/chemical change). He decides to plant seeds in the compost and water them regularly. After a few days, he notices that the seeds begin to germinate and small plants start to grow, eventually blooming into colourful flowers (physical change/chemical change). His efforts are appreciated by all his family members.

Ans. : Prithvi's Green Kitchen

1. Prithvi chops vegetables, peels potatoes, and cuts fruits – S physical changes

2. He collects the seeds, fruits, and vegetable peels into a clay pot – V physical change

3. He collects the seeds, fruits, and vegetable peels into a clay pot — V physical change

4. The fruits, vegetable peels, and other materials decompose into compost — V chemical change

5. Seeds germinate and grow into plants V chemical change

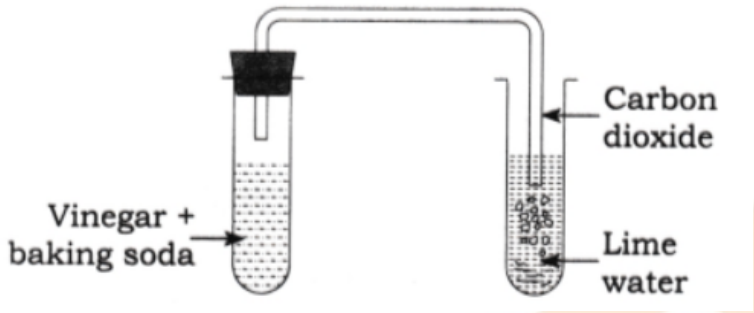
188. Which gas is released when vinegar and baking soda are mixed? What happens when this gas is passed through lime water?

Ans. : When baking soda and vinegar are mixed with each other then carbon dioxide gas is released. When carbon dioxide gas is passed through lime water, then calcium carbonate is formed. Calcium carbonate makes lime water appear milky. The turning of lime water into milky solution is a standard test of carbon dioxide. The following

reactions take place:

(i) Vinegar + Baking soda → Carbon dioxide + Other substances

(ii) Carbon dioxide + Lime water → Calcium carbonate + Water



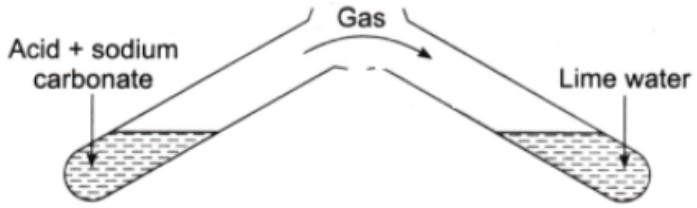
189. If you leave a piece of iron in the open for a few days, it acquires a film of brownish substance, called rust.
(a) Do you think rust is different from iron?
(b) Can you change rust back into iron by some simple method?
(c) Do you think formation of rust from iron is a chemical change?
(d) Give two other examples of a similar type of change.

Ans. : (a) Yes, it is quite different from iron. Rust is formed due to the oxidation of iron in the presence of moist air.
(b) No, this is an irreversible chemical change.
(c) Yes, it is a chemical change because rust is a new substance formed when iron undergoes chemical reaction with the water particles and oxygen present in air and this change cannot be reversed back.
(d) Cooking of food and curdling of milk are other examples of chemical reaction that cannot be reversed.

190. Explain weathering of rocks.

Ans. : Weathering is the process by which rocks are broken down into smaller pieces, eventually forming soil. It occurs through both physical and chemical changes. Physical weathering occurs when large rocks break into smaller pieces without changing their chemical composition. This can be caused by change in temperature due to climate, the growth of tree roots, or the freezing of water within cracks in the rocks. Chemical weathering happens when water or chemicals in the water react with the minerals in rocks, changing their composition. For example, a black coloured rock called basalt, which contains iron, undergoes a chemical change. When exposed to water or moist air for a long time, the iron reacts with oxygen to form iron oxide, which gives the rock a red colour.

191. Observe the following figure and answer the following questions:

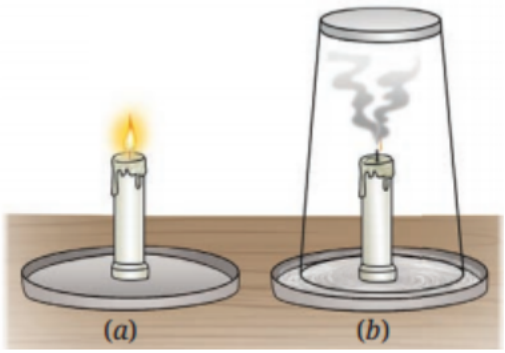


(i) What does this figure show?
(ii) Name the gas released.
(iii) Write the effect of the gas on lime water.
(iv) Write the chemical equation of the reaction.

Ans. : (i) This figure shows the action of an acid over sodium carbonate.
(ii) The gas released is carbon dioxide.
(iii) The lime water becomes milky.
(iv) $\underset{\text{(Lime water)}}{\text{Calcium hydroxide}} + \text{Carbon dioxide} \rightarrow \underset{\text{(Insoluble substance)}}{\text{Carbon carbonate}} + \text{Water}$

192. Is air essential for combustion? Explain with the help of an activity.

Ans. : Take a candle, light it and fix it on a table. Allow the candle to burn steadily. Now, carefully cover the burning candle with a glass jar. We will observe that after some time, the flame flickers and eventually goes out. This occurs because the oxygen inside the jar is consumed by the burning candle, and without a continuous supply of oxygen from the air, combustion cannot be sustained. This experiment shows that air, specifically oxygen, is essential for combustion.



Candle, (a) burning (b) covered with a glass tumbler

193. A cleaned magnesium ribbon about 3-4 cm long is burnt using a burner by holding it with a pair of tongs and the ash so formed is collected in a watch-glass. The magnesium ribbon is kept away as far as possible from eyes.
Q.1. What is the colour of the powder collected in a watch glass ?
Q.2. Write the changes that determines the occurrence of chemical reaction.
Q.3. What is the chemical name of the powder collected in a watch glass ?

Ans. : 1. White
2. Change in state, change in temperature or change in colour determines the

occurrence of a chemical reaction.

3. Magnesium oxide (MgO)

194. Table : Can changes be reversed?

Change	The original state can be brought back (Yes/ No)
Melting ice cubes	
Chopping vegetables	
Boiling water	
Making popcorn from corn	
Cutting a piece of paper	
Adding beetroot extract to water	
Burning wood	
Diying wet clothes	
Making small balls of dough	
Rolling small balls of dough into chapatis	
Cooking of food	
Making pot from mud	

Ans. :

Change	The original state can be brought back (Yes/ No)
Melting ice cubes	Yes
Chopping vegetables	No
Boiling water	Yes
Making popcorn from corn	No
Cutting a piece of paper	No
Adding beetroot extract to water	No
Burning wood	No
Diying wet clothes	Yes
Making small balls of dough	Yes
Rolling small balls of dough into chapatis	Yes
Cooking of food	No

Making pot from mud	No

Conclusion: Changes around us can be grouped into reversible (original substance can be brought back) and irreversible (original substance cannot be brought back) changes.

*** consists of questions of 5 marks each.** **[30]**

195. Explain the concept of chemical reactions with two examples.

Ans. : → A chemical reaction is a process where one or more substances (reactants) are converted into new substances (products).
→ This involves the breaking and forming of chemical bonds.
Chemical reactions are usually irreversible, meaning you can't easily go back to the original substances.
Example:
1.Burning Wood
Reactants: Wood (primarily carbon compounds) and Oxygen O_2 in the air.
Process: When you light a fire, the wood combines with oxygen in a process called combustion.
Products: Carbon Dioxide CO_2,Water H_2O,Ash, and Heat/Light.
Explanation: The wood is changed into completely different substances (gases and ash), and you can't turn the ash and gases back into wood.
2.Rusting of Iron
Reactants: Iron (Fe), OxygenO_2 and Water H_2O
Process: Over time, iron reacts with oxygen and water in the air.
Product: Rust (Iron Oxide, Fe_2O_3)
Explanation: The shiny iron metal turns into a reddish-brown, flaky substance (rust). The original iron has been transformed into a new compound, and you can't simply turn the rust back into iron.

196. How can we distinguish between physical and chemical changes? Provide at least three examples.

Ans. : Physical Change:
A change that affects the form or appearance of a substance but does not change its chemical composition.
Chemical Change:
A change that involves the formation of new substances with different chemical compositions and properties.
Examples:
1. Burning Wood (Chemical):
→ Wood reacts with oxygen to produce carbon dioxide, water, ash, and heat.

→ New substances (gases and ash) are formed.
→ You cannot turn the ash and gases back into wood, so it's irreversible.

2.Rusting of Iron (Chemical):

→ Iron reacts with oxygen and moisture to form rust (iron oxide).
→ A new substance (rust) with different properties is formed.
→ It's very difficult to turn rust back into iron.

3. Melting Ice (Physical):

→ Ice (H2O in solid form) changes to water (H2O in liquid form).
→ The chemical composition (H2O)remains the same.
→ You can freeze the water back into ice, so it's reversible.

4.Dissolving Sugar in Water (Physical):

→ Sugar disperses evenly in water.
→ It remains sugar.
→ You can evaporate the water to get the sugar back.

5. **Cooking an Egg (Chemical):**

→ The egg white and yolk change texture and color when heated.
→ The proteins in the egg undergo a chemical change (denaturation).
→ You cannot uncook an egg to get the original raw egg back.

197. What is the role of heat in combustion reactions? Explain with an example.

Ans. : → Heat plays a crucial role in combustion reactions by initiating and sustaining the process. Combustion requires a certain amount of energy to begin, and this energy is provided by heat. Here's a breakdown:

→ Heat raises the temperature of the fuel to its ignition temperature. The ignition temperature is the minimum temperature at which a substance starts to burn in the presence of oxygen.

→ Once combustion begins, it releases more heat. This heat helps to maintain the temperature needed for the reaction to continue, creating a self-sustaining process.

Example:

Burning Magnesium Ribbon

→ When we hold a flame to a magnesium ribbon, the heat from the flame raises the temperature of the magnesium to its ignition temperature.

→ Once the magnesium reaches this temperature, it reacts with oxygen in the air:

→ $2Mg + O_2 \rightarrow 2MgO +$ Heat + Light

→ The reaction produces heat and light. The heat produced keeps the remaining magnesium at or above its ignition temperature, allowing the combustion to continue until all the magnesium is burned.

198. What are the conditions necessary for combustion to occur? Describe with an experiment.

Ans. : Combustion, or burning, requires three main components, often referred to as the fire triangle:

Fuel: A substance that can burn.
Oxygen: An oxidizer to support the burning process.
Heat: Enough energy to raise the fuel to its ignition temperature.
Experiment to Demonstrate Combustion
Title: Investigating the Conditions for Combustion
Materials:
→ Two small candles
→ Matches or a lighter
→ A glass tumbler or jar
→ A fireproof surface (like a ceramic plate)
Procedure:
1. **Set Up:** Place both candles on the fireproof surface and light them using the matches or lighter.
2. **Observe:** Let both candles burn for a few moments and observe them.
3. **Cover One Candle:** Carefully place the glass tumbler or jar over one of the burning candles.
4. **Observe Again:** Watch what happens to both candles.
Observations:
→ The uncovered candle continues to burn normally.
→ The covered candle's flame will start to diminish and eventually extinguish itself.
Explanation:
→ **Uncovered Candle:** The uncovered candle has a continuous supply of fuel (wax), oxygen from the air, and the heat from the flame. All three conditions are met, so combustion continues.
→ **Covered Candle:** The covered candle initially has fuel, oxygen, and heat. However, as it burns, it consumes the available oxygen inside the tumbler. Once the oxygen is depleted, there is no longer enough oxidizer to support combustion, and the flame goes out.

199. How does weathering lead to the formation of soil? Explain the physical and chemical changes involved.

Ans. : Weathering is the natural process that breaks down rocks into smaller particles, eventually leading to the formation of soil. This process involves both physical and chemical changes.
1.Physical Changes
→ These changes involve breaking rocks into smaller pieces without changing their chemical composition.
→ **Examples:**
→ Temperature Changes: Rocks expand when heated and contract when cooled. Over time, this can cause them to crack.
→ Water seeps into cracks, freezes, and expands. This expansion widens the cracks, eventually breaking the rock.

→ As roots grow, they can exert pressure on rocks, causing them to split.

2.Chemical Changes

→These changes alter the chemical composition of rocks.

→ **Examples:**

→ Iron-containing rocks can react with oxygen and water, forming iron oxide (rust). This weakens the rock.

→ Minerals absorb water, which can change their structure and cause the rock to crumble.

→ Acid Rain: Rainwater can react with certain types of rocks, dissolving them over time.

200. Create a simple experiment to demonstrate a reversible physical change.

Ans. : Title: Melting and Freezing Water

Materials:

→ Ice cubes

→ A glass or beaker

→ A heat source (like a stove or a microwave - with adult supervision!) or just a warm environment

→ A freezer

Procedure:

1. **Melting:**

→ Place an ice cube in the glass or beaker.

→ Leave the glass at room temperature or gently heat it (with adult supervision) until the ice cube melts into liquid water.

→ Observe the change. The solid ice turns into liquid water.

2. **Freezing:**

→ Place the glass of liquid water in the freezer.

→ Leave it in the freezer for a few hours until the water freezes and turns back into solid ice.

→ Observe the change. The liquid water turns back into solid ice.

Explanation:

→ Melting is a physical change where solid ice changes into liquid water when heat is applied.

→ Freezing is also a physical change where liquid water changes back into solid ice when the temperature is lowered.

→ This experiment demonstrates a reversible change because the water changes its state (solid to liquid and back), but it's still water. No new substance is formed.

*** Match the Following.** **[8]**

Column A	Column B
201. Burning of magnesium	(a) Release of carbon dioxide
202. Melting of wax	(b) Liquid to gas

203. Boiling of water	(c) White dazzling flame
204. Mixing vinegar & baking soda	(d) Brown substance is lormed
	(e) Solid to liquid

Ans. : (1-c,b-e,3-b,4-a)

Column A	Column B
205. Erosion	(a) Chemical change
206. Weathering of rocks	(b) Physical change
207. Souring of milk	(c) Turns lime water milky
208. Carbon dioxide	(d) both physical and chemical change

Ans. :

Column A	Column B
1. Erosion	(b) Physical change
2. Weathering of rocks	(d) both physical and chemical change
3. Souring of milk	(a) Chemical change
4. Carbon dioxide	(c) Turns lime water milky

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