

* Choose the correct alternative from those given below each questions [36]

1. Which of the following metals is the most ductile, capable of being drawn into extremely thin wires?

- (A) Copper (B) Silver (C) Aluminium (D) Gold

Ans. : (D) Gold

2. Which of the following oxides would turn red litmus paper blue, indicating a basic nature?

- (A) Sulphur dioxide (B) Carbon dioxide
(C) Magnesium oxide (D) Phosphorus pentoxide

Ans. : (C) Magnesium oxide

3. The non-metal essential for the manufacture of fertilisers that supports healthy plant growth is:

- (A) Phosphorus (B) Chlorine (C) Nitrogen (D) Oxygen

Ans. : (C) Nitrogen

4. What happens when a reactive metal like magnesium reacts with oxygen?

- (A) A brown deposit is formed
(B) The metal melts
(C) It produces a basic oxide and a bright flame
(D) It forms an acidic gas

Ans. : (C) It produces a basic oxide and a bright flame

5. Which of the following correctly pairs the material and its property relevant to electrical conduction?

- (A) Wood - Good conductor
(B) Coal - Good conductor
(C) Aluminium - Poor conductor
(D) Copper - Excellent conductor

Ans. : (D) Copper - Excellent conductor

6. Which of the following best explains why rusting occurs only in moist air?

- (A) Air accelerates the loss of electrons in metals
(B) Water forms a barrier, preventing oxygen from escaping
(C) Water and oxygen together create the right conditions for oxidation
(D) Moist air increases the temperature for faster reactions



Ans. : (C) Water and oxygen together create the right conditions for oxidation

7. Which of the following combinations would most likely form acidic oxides on combustion?

- (A) Aluminium and iron (B) Copper and zinc
(C) Sulphur and phosphorus (D) Sodium and potassium

Ans. : (C) Sulphur and phosphorus

8. The brown flaky substance seen on old iron gates or nails is:

- (A) Copper rust (B) Aluminium oxide (C) Iron sulphide (D) Iron oxide (rust)

Ans. : (D) Iron oxide (rust)

9. Which of the following best explains why non-metals are not used to make tools or utensils?

- (A) They are rare
(B) They are brittle and poor conductors
(C) They are too shiny
(D) They are heavier than metals

Ans. : (B) They are brittle and poor conductors

10. A cable manufacturing unit tested few elements on the basis of their physical properties.

Properties	W	X	Y	Z
Malleable	Yes	No	No	Yes
Ductile	Yes	No	No	Yes
Electrical Conductivity	Yes	Yes	Yes	No
Melting Point	High	Low	Low	High

Which of the above elements were discarded for usage by the company?

- (A) W, X, Y (B) X, Y, Z (C) W, X, Z (D) W, X, Z

Ans. : (B) X, Y, Z

11. Which of the following is a non-metal used in antiseptics?

- (A) Chlorine (B) Iodine (C) Nitrogen (D) Phosphorus

Ans. : (B) Iodine

12. The green coating on copper utensils is due to:

- (A) Corrosion (B) Galvanisation (C) Polishing (D) Heating

Ans.: (A) Corrosion

13. The process of rusting requires:

- (A) Air only (B) Water only (C) Moist air (D) Light and air

Ans. : (C) Moist air



14. Which of the following is brittle?

- (A) Iron (B) Aluminium (C) Sulphur (D) Copper

Ans. : (C) Sulphur

15. The non-metal necessary for plant growth is:

- (A) Oxygen (B) Nitrogen (C) Chlorine (D) Iodine

Ans. : (B) Nitrogen

16. Which among these is a poor conductor of electricity?

- (A) Iron (B) Coal (C) Aluminium (D) Copper

Ans. : (B) Coal

17. Which of these substances is malleable and ductile both?

- (A) Wood (B) Iron (C) Sulphur (D) Coal

Ans. : (B) Iron

18. The sound produced by dropping a metal is due to:

- (A) Sonority (B) Lustre (C) Malleability (D) Conduction

Ans.: (A) Sonority

19. What makes aluminium suitable for packaging?

- (A) Malleability (B) Colour (C) Lustre (D) Conductivity

Ans.: (A) Malleability

20. Which of these changes red litmus to blue?

- (A) Sulphur oxide solution (B) Magnesium oxide solution
(C) Water (D) Vinegar

Ans. : (B) Magnesium oxide solution

21. Which of the following is a good conductor of heat and electricity?

- (A) Rubber (B) Coal (C) Iron (D) Wood

Ans. : (C) Iron

22. Sonorous substances are mainly:

- (A) Plastics (B) Non-metals (C) Metals (D) Liquids

Ans. : (C) Metals

23. Which of these metals is cut with a knife?

- (A) Iron (B) Copper (C) Sodium (D) Aluminium

Ans. : (C) Sodium

24. Which non-metal is used in water purification?

- (A) Nitrogen (B) Oxygen (C) Chlorine (D) Phosphorus



Ans. : (C) Chlorine

25. Which metal is commonly used to make food packaging materials as it is cheaper, and its thin sheets can be folded easily into any shape?

- (A) Aluminium (B) Copper (C) Iron (D) Gold

Ans.: (A) Aluminium

26. Which of the following metal catches fire when it comes in contact with water?

- (A) Copper (B) Aluminium (C) Zinc (D) Sodium

Ans. : (D) Sodium

27. Which one of the following is a metal?

- (A) Iodine (B) Iron (C) Wood (D) Coal

Ans. : self

28. Which of the following cannot produce a ringing sound when struck hard?

- (A) Phosphorus (B) Copper (C) Iron (D) Aluminium

Ans. : self

29. Choose the material that is a good conductor of electricity:

- (A) Coal (B) Wood (C) Rubber (D) Iron nail

Ans. : self

30.

Column A	Column B
(i) Gold and silver	(a) Liquid at room temperature
(ii) Copper and iron	(b) Most ductile metals
(iii) Sodium and potassium	(c) Can be drawn into wires
(iv) Mercury	(d) Can be cut with a knife

- (A) (i)-(d), (ii)-(c), (iii)-(b), (iv)-(a) (B) (i)-(d), (ii)-(a), (iii)-(b), (iv)-(c)
(C) (i)-(a), (ii)-(d), (iii)-(b), (iv)-(c) (D) (i)-(b), (ii)-(c), (iii)-(d), (iv)-(a)

Ans. : self

31. Which of the following is not a metal?

- (A) Copper (B) Sulphur (C) Aluminium (D) Iron

Ans. : (B) Sulphur

32. The metals which can be cut with a knife are

- (A) Sodium and potassium (B) Barium and calcium
(C) Sodium and mercury (D) Potassium and calcium.

Ans.: (A) Sodium and potassium

33. Which of the following metals is in the liquid state at room temperature?

- (A) Sodium (B) Silver (C) Aluminium (D) Mercury



Ans. : (D) Mercury

34. Which of the following is not a property of metals?

- (A) Malleability (B) Ductility (C) Brittleness (D) Sonority

Ans. : (C) Brittleness

35. Which of the following non-metals reacts and catches fire on exposure to air?

- (A) Phosphorus (B) Nitrogen (C) Sulphur (D) Hydrogen

Ans.: (A) Phosphorus

36. The nature of metal oxides is

- (A) acidic (B) basic (C) neutral (D) all of these.

Ans. : (B) basic

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

37. Assertion (A): Metals are used in cooking utensils.

Reason (R): Metals are good conductors of heat.

- (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).

38. Assertion (A): Aluminium is used in food wrapping.

Reason (R): It is highly malleable.

- (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): Iron develops rust when comes into contact with moist air.

Reason (R): It reacts with air and water.

- (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.

(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).

40. Assertion (A): Mercury is solid at room temperature.

Reason (R): It is used in thermometers.

(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): Non-metals react with water to form oxides.

Reason (R): They are good conductors of electricity.

(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. : self

42. Assertion (A): Phosphorus is stored in water.

Reason (R): Phosphorus reacts rapidly with oxygen in the air.

(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

43. Assertion (A): Metals are good conductors of electricity.

Reason (R): Metals can be beaten into thin sheets.

(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.



44. Assertion (A): Non-metals are non-sonorous.
Reason (R): Non-metals produce a ringing sound when struck.
(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.

45. Assertion (A): Gold is the most ductile metal.
Reason (R): Ductility is the ability to be drawn into thin wires.
(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.: (A) Both A and R are true and R is the correct explanation of A.

46. Assertion (A): Sodium is stored in kerosene oil.
Reason (R): Sodium reacts very slowly with oxygen 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. : (C) A is true but R is false.

47. Assertion (A): Non-metals form acidic oxides.
Reason (R): Non-metallic oxides turn blue litmus paper red.
(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.

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

[23]

48. Aluminium is a non-metal.

Ans. : false

49. Sulphur is ductile.

Ans. : false

50. Magnesium oxide is acidic in nature.



Ans. : false

51. Sodium is stored in water.

Ans. : false

52. Malleability is a property of non-metals.

Ans. : false

53. Silver is both malleable and ductile.

Ans. : true

54. Rust is formed due to the reaction of iron with moist air.

Ans. : true

55. Non-metals can form wires.

Ans. : false

56. Coal is a poor conductor of heat.

Ans. : true

57. The oxide of a non-metal turns blue litmus red.

Ans. : true

58. Aluminium and copper are examples of non-metals used for making utensils and statues.

Ans. : False, Aluminium and copper are examples of metals, not non-metals.

59. Metals form oxides when combined with oxygen, the solution of which turns blue litmus paper to red.

Ans. : False, Metal oxides are basic, they turn red litmus paper to blue.

60. Oxygen is a non-metal essential for respiration.

Ans. : True, Oxygen is a non-metal and is essential for respiration.

61. Copper vessels are used for boiling water because they are good conductors of electricity.

Ans. : False, Copper vessels are used for boiling water because copper is a good conductor of heat.

62. Oxygen is essential for respiration.

Ans. : self

63. Aluminium is stored in water.

Ans. : self

64. Coal is a brittle material

Ans. : self

65. Non-metals are sonorous.



Ans. : false

66. Coal and sulphur are examples of brittle nonmetals.

Ans. : true

67. Metals are poor conductors of electricity.

Ans. : false

68. Rusting only occurs in the presence of water.

Ans. : false

69. Non-metallic oxides turn red litmus paper blue.

Ans. : false

70. Phosphorus is stored in water because it reacts with air.

Ans. : true

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

[14]

71. _____ is used in antiseptics and wound healing.

Ans. : Iodine

72. The Iron Pillar of Delhi is resistant to _____.

Ans. : rusting

73. _____ metal is used in the wrapping of food.

Ans. : Aluminium

74. _____ is the property that allows metals to be beaten into sheets.

Ans. : Malleability

75. Oxides of non-metals are generally _____ in nature.

Ans. : acidic

76. A _____ sound is produced when metal is struck.

Ans. : ringing

77. _____ is a non-metal used in fertilisers.

Ans. : Nitrogen

78. The process of coating zinc on iron is called _____.

Ans. : galvanisation

79. A substance that cannot be broken down into simpler substances is called an _____.

Ans. : element

80. The shine on the surface of metals is known as _____.

Ans. : metallic lustre

81. The nature of metallic oxides is _____ .

Ans. : basic

82. Non-metals are _____ conductors of heat and electricity.

Ans. : bad/poor

83. The only metal that is liquid at room temperature is _____ .

Ans. : mercury

84. _____ is used in the manufacturing of fertilisers and other chemicals.

Ans. : Nitrogen

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

[63]

85. Name a metal that is liquid at room temperature.

Ans. : Mercury is a metal that is found in a liquid state at room temperature.

86. What is rust?

Ans. : When iron objects are left in moist air, they develop a brown deposit. This deposit is called rust.

87. Write two examples of a non-metal.

Ans. : (1) Oxygen (2) Carbon

88. What is the use of silica gel?

Ans. : Silica gel makes the air dry. It is used in small pouches in medicine bottles, water bottles, and shoe boxes to keep them dry.

89. Define corrosion.

Ans. : Corrosion is the gradual deterioration or damage of metal surfaces. It is caused by the reaction of the metal with air, water, or other substances in the environment.

90. Name a metal used for making musical instruments.

Ans. : Metal wires play important functions in a musical instruments.

91. What does sonorous mean?

Ans. : If a material makes a ringing sound when we hit it, it's called sonorous.

92. Why is plastic used on electrical wires?

Ans. : Plastic is used on electrical wires because it is a poor conductor of electricity and protects us from electric shock.

93. Can you give some examples of metal sheets?

Ans. : Some examples of metal sheets are silver foil and aluminium foil.

94. Can you name some metals that are used for making cooking vessels?



Ans. : Metals like aluminium, copper, and stainless steel are commonly used for making cooking vessels.

95. Have you ever seen an electrician using a screwdriver? What type of material is used for making its handle?

Ans. : Yes. The handle of a screwdriver is usually made of plastic or rubber.

96. Observation: Metal spoon and metal coin produce a ringing sound. On the other hand, coal and wood produce dull sounds.

Ans. : Conclusion: Metals are sonorous, they produce a ringing sound.

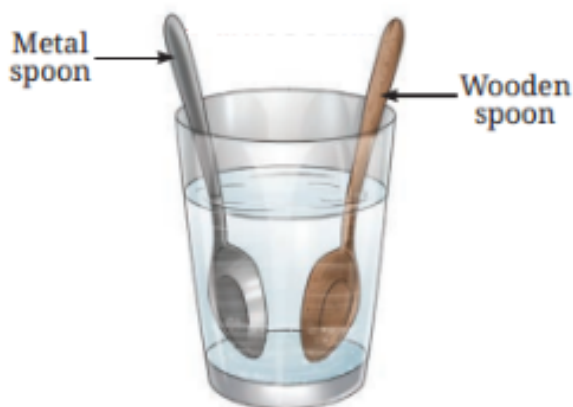
97. Observation : When sulphur is placed in water, no reaction occurs.

Ans. : Conclusion : Sulphur does not react with water.

98. You are provided with three iron nails, each dipped in oil, water and vinegar. Which iron nail will not rust, and why?

Ans. : The iron nail dipped in oil will not rust because the oil prevents the iron nail from coming into contact with air or moisture. It forms a protective layer on the metal, which prevents rusting.

99. Observation : Metal spoon is hotter to touch than wooden spoon.



Ans. : Conclusion : Heat transfers through the metal spoon easily, making it hotter. While heat transfers through the wooden spoon poorly. Hence, metals are good conductors of heat, but wood is a poor conductor of heat.

100. Observation : Magnesium ribbon burns with a dazzling white flame and changes into a white powder (ash).



The solution changes the colour of red litmus paper to blue.



Ans. : Conclusion : Magnesium burns with oxygen in the air and produces magnesium oxide.

The oxides of metals are generally basic in nature.

101. What is an element?

Ans. : An element is a substance that cannot be broken down into simpler substances.

102. How many elements are known at present?

Ans. : Presently, there are 118 elements known.

103. How many types of elements are there?

Ans. : There are two types of elements: (i) Metals (ii) Non-metals

104. Name two soft metals which can be cut with a knife.

Ans. : Sodium and potassium

105. How can you distinguish metals from nonmetals?

Ans. : Metals can be distinguished from non-metals on the basis of their properties.

106. What do you mean by malleability?

Ans. : The property of metals by which they can be beaten into thin sheets is called malleability.

107. Coal and pencil lead do not show the property of malleability. Can we call them metal?

Ans. : No, they are not metals.

108. Write the name of two most malleable metals.

Ans. : Gold and silver.

109. Which liquid metal is used in thermometers?

Ans. : Mercury

110. What is ductility?

Ans. : The property of metals by which they can be drawn into wires is called



ductility.

111. What do you mean by sonority?

Ans. : The property of metals that enables them to produce a ringing sound is called sonority.

112. Do non-metals conduct electricity?

Ans. : No, non-metals are poor conductors of electricity.

113. What happens when a metal reacts with oxygen?

Ans. : When a metal reacts with oxygen, metal oxide is formed.

114. What is the nature of metal oxide?

Ans. : Metal oxides are basic in nature.

115. Name the product formed by the reaction of sulphur and oxygen.

Ans. : Sulphur dioxide gas.

116. What is the effect of sulphurous acid on blue litmus paper?

Ans. : Blue litmus paper turns to red.

117. What is the nature of non-metal oxide?

Ans. : Mostly non-metal oxides are acidic in nature.

118. Which non-metal is used to disinfect water?

Ans. : Chlorine

119. What are the essential conditions for rusting?

Ans. : (i) Presence of moisture (water)
(ii) Presence of air (oxygen)

120. What is rusting of iron? How can it be prevented?

Ans. : Rusting of iron is the formation of a brown layer on iron when it reacts with air and water. It can be prevented by painting, oiling, greasing, or galvanisation.

121. What happens when sulphur burns in air?

Ans. : When sulphur burns in air, it forms sulphur dioxide gas. This gas dissolves in water to form sulphurous acid.

122. You are given the following materials. Classify them into metals and non-metals.
Iron, Coal, Sulphur, Gold, Nitrogen, Aluminium and Copper.

Ans. : Metals: Iron, gold, aluminium and copper
Non-metals: Coal, sulphur and nitrogen

123. Suppose a new material was discovered. It is shiny, can be drawn into wires and conducts electricity well. Would you classify it as a metal or a non-metal? Why?

Ans. : The material would be classified as a metal because it shows the characteristic properties of metals:



1. Shiny surface (lustrous)
2. Ductility (can be drawn into wires)
3. Good conductivity of electricity

124. A copper wire was used in an electric circuit, and it conducted electricity well. If you replace it with a piece of coal, what will happen? Why?

Ans. : If the copper wire is replaced with coal, the circuit may not work properly because coal is a non-metal and a poor conductor of electricity, unlike copper, which is a metal and a good conductor.

125. How many elements are currently known?

Ans. : there are 118 known chemical elements in the modern periodic table.

126. Give two examples of non-metals.

Ans. : examples of non-metals are sulfur and oxygen.

127. What is formed when sulphur burns in air?

Ans. : When sulphur burns in air, sulphur dioxide (SO_2) is formed.

128. What happens to silver in the open atmosphere?

Ans. : In the open atmosphere, silver slowly tarnishes and forms a black coating of silver sulfide.

129. Mention one use of chlorine.

Ans. : One use of chlorine is to purify drinking water and make it safe by killing harmful bacteria.

130. Why are materials like plastic, glass, wood, and rubber not classified as metals or non-metals?

Ans. : Materials like plastic, glass, wood, and rubber are not classified as metals or non-metals because they do not show typical properties of metals or non-metals.

131. What are metallic oxides and what is their nature?

Ans. : Metallic oxides are compounds formed when metals react with oxygen. They are generally basic in nature.

132. Why is coal considered as a non-metal?

Ans. : Coal is considered a non-metal because it does not have the properties of metals, such as malleability, ductility, and metallic luster.

133. What happens when blue litmus paper is dipped into a solution of sulphur dioxide?

Ans. : When blue litmus paper is dipped into a solution of sulphur dioxide, it turns red because sulphur dioxide forms an acidic solution in water.

134. Name one soft metal and one hard metal.

Ans. : One soft metal is sodium, and one hard metal is iron.



135. What is meant by "sonority"? Which type of elements are sonorous?

Ans. : Sonority is the property of a metal to produce a ringing sound when struck. Metals are sonorous.

136. Why is nitrogen useful in our daily lives?

Ans. : Nitrogen is useful in our daily lives because it is used in making fertilizers, which help plants grow.

137. Write any three uses of metals.

Ans. : Three uses of metals are: making electrical wires, building structures, and making utensils.

138. How many elements are currently known?

Ans. : 118 elements

139. Which metal is liquid at room temperature?

Ans. : Mercury

140. What do we call the shine present on the surface of metals?

Ans. : Metallic lustre

141. Which property of metals allows them to be drawn into wires?

Ans. : Ductility

142. Name a non-metal used in water purification.

Ans. : Chlorine

143. Which non-metal is essential for respiration?

Ans. : Oxygen

144. Name one non-metal that is stored in water.

Ans. : Phosphorus

145. Which non-metal is a key component of proteins and carbohydrates?

Ans. : Carbon

146. Name the gas which is formed on burning of sulphur?

Ans. : Sulphur dioxide gas

147. Solution of which non-metal is applied on wounds as an antiseptic?

Ans. : Iodine

* consists of questions of 2 marks each.

[70]

148. Differentiate between malleability and ductility.

Ans. :

Feature	Malleability	Ductility
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Definition	Ability to be hammered or pressed into thin sheets.	Ability to be drawn or stretched into wires.
Action	Compressing or hammering	Pulling or stretching

149. Explain why metals are used in electrical fittings.

Ans. : Metals are used in electrical fittings primarily because they are excellent conductors of electricity, allowing electric current to flow easily with minimal resistance. Additionally, metals are durable and can be shaped into wires and other components needed for electrical circuits and systems.

150. Give reason:

Mercury is used in thermometers.

Ans. : Mercury is used in thermometers because it has a uniform rate of thermal expansion, which means it expands predictably with temperature changes, allowing for accurate temperature readings. Additionally, mercury remains in a liquid state over a wide range of temperatures, making it suitable for measuring both high and low temperatures.

151. Give reason:

Gold is preferred for jewellery.

Ans. : Gold is preferred for jewellery due to its high malleability and ductility, which allows it to be easily shaped into intricate designs and drawn into fine wires. Additionally, gold is highly resistant to corrosion and tarnishing, maintaining its luster and beauty over time, making it a valuable and long-lasting choice for jewellery.

152. How does rusting occur?

Ans. : Rusting occurs when iron or its alloys are exposed to both oxygen and moisture. The iron reacts with oxygen in the presence of water, forming iron oxide, which is commonly known as rust. This process weakens the iron and causes it to corrode over time.

153. Why do electricians use rubber gloves?

Ans. : Electricians use rubber gloves for protection against electric shock. Rubber is a poor conductor of electricity, preventing electric current from passing through the electrician's body and ensuring safety while working with electrical equipment.

154. Why are wires not made from coal?

Ans. : Wires cannot be made from coal because coal is not ductile. Ductility is the property that allows a material to be drawn into wires. Coal is brittle, meaning it breaks easily instead of stretching into a wire.

155. Compare metals and non-metals with two points.



Ans. :

Characteristic	Metals	Non-metals
Luster	Generally lustrous (shiny)	Generally non-lustrous (dull)
Heat Conductivity	Good conductors of heat	Poor conductors of heat

156. Write two uses each of metals and non-metals.

Ans. : Metals:

1.Construction: Metals like steel and aluminum are used in building bridges and buildings due to their strength and durability.

2.Electrical Wiring: Copper is widely used in electrical wires because it is a good conductor of electricity.

Non-metals:

1.Fertilizers: Nitrogen is used in the production of fertilizers to promote plant growth.

2.Water Purification: Chlorine is used to disinfect water and make it safe for drinking.

157. What are the effects of corrosion?

Ans. : Corrosion weakens and damages metal structures, leading to significant economic losses due to the need for frequent repairs and replacements. Additionally, corroded structures can pose safety hazards, potentially collapsing and causing accidents, while also releasing harmful substances that can pollute the environment.

158. Predict what would happen if all metals turned non-sonorous.

Ans. : If metals were to lose their sonorous properties, the world would experience significant changes. Musical instruments that rely on the distinct ringing sound of metals would no longer produce their characteristic tones, requiring alternative materials or methods for creating music.

159. Analyse why sulphur cannot be used to prevent rusting.

Ans. : Sulfur cannot be used to prevent rusting because when sulfur is burned in the air, sulfur dioxide gas is formed. When sulfur dioxide gas is dissolved in water, sulfurous acid is formed. For rusting to happen, there must be water, and if we add Sulphur, it will hasten the process of rusting.

160. Suggest materials for a new building which are resistant to corrosion.

Ans. : For a new building that resists corrosion, you could use materials like stainless steel and aluminum alloys for the exterior structure since they naturally resist

rusting. Additionally, composite materials and certain plastics are also excellent choices because they don't corrode at all.

161. Design a small experiment to test ductility at home safely.

Ans. : To test ductility, gather a copper wire and aluminum foil. Using pliers, gently stretch the copper wire to see if it can be drawn into a thinner strand without breaking. Then, try stretching the aluminum foil by hand to observe if it stretches or tears. The material that stretches more without breaking is more ductile, demonstrating its ability to be drawn into a wire.

162. Why do vessels have wooden handles despite being made of metal?

Ans. : Vessels are made of metal to conduct heat, but they have wooden handles because wood is a poor conductor of heat. This prevents the handle from getting too hot, allowing you to hold the vessel safely without burning our hand.

163. Explain why food spoils faster in rusted iron containers.

Ans. : Food spoils faster in rusted iron containers due to the rust (iron oxide) acting as a catalyst that accelerates the decomposition of organic materials. Additionally, rust can create a porous surface, allowing moisture and air to interact more readily with the food, fostering bacterial growth and spoilage.

164. Discuss the significance of recycling metals.

Ans. : Recycling metals is significant because it conserves natural resources by reducing the need for mining, which in turn helps protect ecosystems. Additionally, it lowers energy consumption and pollution levels, as recycling processes require less energy and produce fewer emissions compared to extracting and processing new materials.

165. If a spoon is made of coal, what problems may arise?

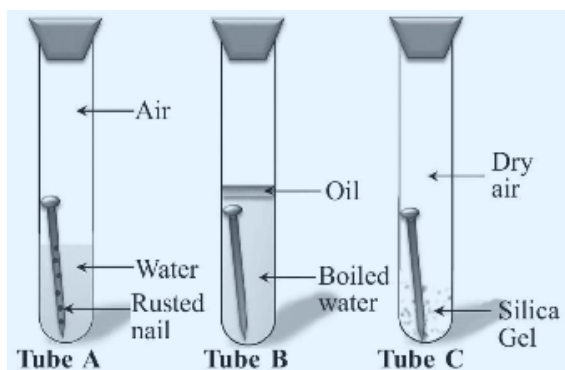
Ans. : If a spoon is made of coal, several problems may arise: Coal is brittle and can easily break or shatter with minimal force, making it unsuitable for stirring or scooping. Coal is a poor conductor of heat, so it cannot be used for stirring hot liquids or food items as it does not transfer heat efficiently and may burn the user.

166. Interpret why jewellery made from sodium would not be safe.

Ans. : Jewellery made from sodium would not be safe because Sodium is highly reactive with moisture and oxygen in the air. It would quickly corrode and lose its appearance, and could even ignite spontaneously.

167. Study the image showing three test tubes (Tube A, Tube B, and Tube C) with different conditions for iron nails.



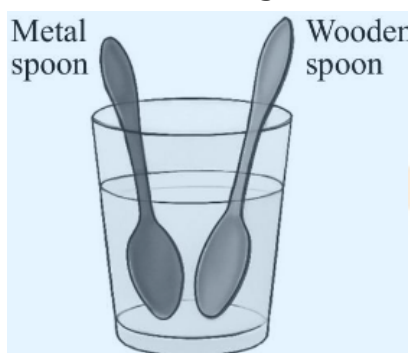


(a) In which tube will the rusting of the iron nail occur, and why?

(b) If you were to repeat this experiment using a non-metal, which non-metal would you choose and why?

Ans. : self

168. Observe the image of a metal and a wooden spoon placed in hot water.



(a) Which spoon would get hotter after a few minutes, and why?

(b) What practical conclusion can we draw from this activity regarding utensil design?

Ans. : self

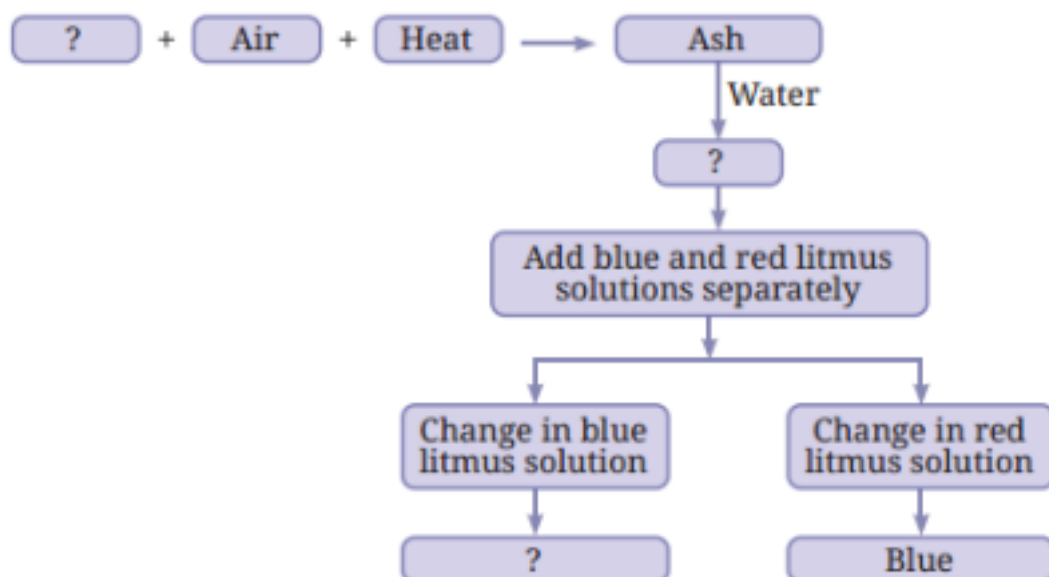
169. Why are only a few metals suitable for making jewellery?

Ans. : Only a few metals are suitable for making jewellery because they are lustrous. These metals are also soft, which allows them to be easily shaped into various designs. Also, they do not react easily with air or water, so they do not rust or lose their shine over time.

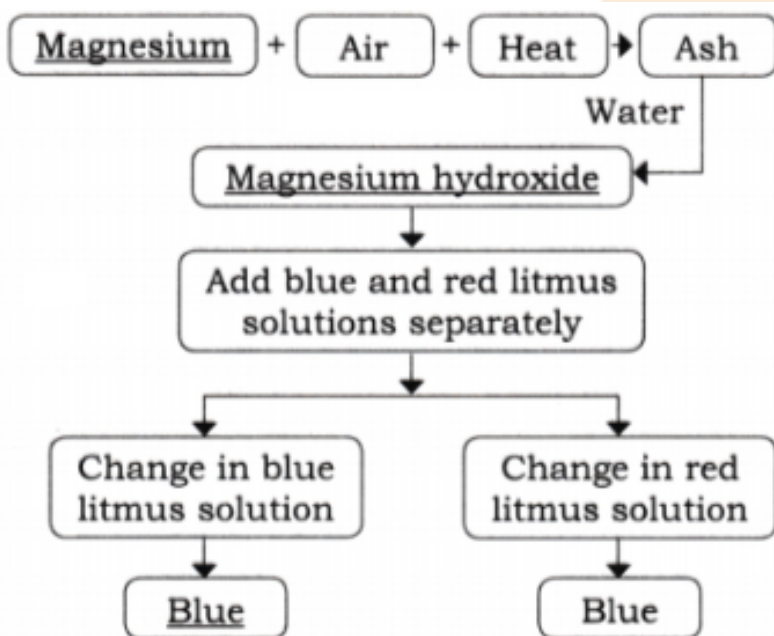
170. What happens when oxygen reacts with magnesium and sulphur. What are the main differences in the nature of products formed?

Ans. : When oxygen reacts with magnesium, it forms magnesium oxide, which is a basic oxide and turns red litmus paper to blue. However, when oxygen reacts with sulphur, it forms sulphur dioxide, which is an acidic oxide and turns blue litmus paper to red.

171. Complete the following flowchart :



Ans. :



172. You are provided with the following materials. Discuss which material would be your choice to make a pan that is most suitable for boiling water and why?

Ans. : For boiling water, the pan must be made of a material that is a good conductor of heat. Among the given materials, only iron and copper are metals and both are good conductors of heat. However, copper is the best choice because it is highly resistant to rust compared to iron. Therefore, a pan made of copper is the most suitable choice for boiling water.

173. One of the methods of protecting iron from getting rusted is to put a thin coating of zinc metal over it. Since sulphur does not react with water, can it be used for this purpose? Justify your answer.

Ans. : No, sulphur cannot be used to protect iron from rusting. While sulphur does not react with water, it does not have the property of forming a protective layer over iron like zinc. It cannot prevent air and moisture from coming into contact with the iron.

174. An ironsmith heats iron before making tools Why is heating necessary in this process?

Ans. : For making tools, a ironsmith first heats a piece of iron until it becomes red-hot. This is because heating makes the iron soft, more malleable and easier to bend, hammer and mould into the desired shape for tools.

175. Observation : The solution obtained after the addition of water to the glass jar turns blue litmus paper to red.

Ans. : Conclusion :

- Sulphur burns with oxygen in the air and produces sulphur dioxide gas.
- On dissolving sulphur dioxide gas in water, sulphurous acid is formed, which turns blue litmus paper to red. Thus, oxides of non-metals are acidic in nature.

176. Observation : Table : Conduction of electricity by different objects or materials

Object/ Material	Observation (bulb glows/ does not glow)	Good conductor of electricity or poor conductor of electricity
Piece of aluminium foil	Bulb glows	Good conductor of electricity
Iron nail	Bulb glows	Good conductor of electricity
Lump of sulphur (peasized)	Bulb does not glow	Poor conductor of electricity
Copper wire	Bulb glows	Good conductor of electricity
Piece of coal	Bulb does not glow	Poor conductor of electricity
Piece of dry wood	Bulb does not glow	Poor conductor of electricity
Stone	Bulb does not glow	Poor conductor of electricity

Ans. : Conclusion : Materials like aluminium, iron and copper allows electricity to pass through them. So, they are good conductors of electricity.

Materials like sulphur, coal, dry wood, stone, eraser and nylon do not allow electricity to pass through them. So, they are poor conductors of electricity.

177. Phosphorus is kept in water. Why?

Ans. : Generally, non-metals do not react with water, but they may be very reactive in air. Such non-metals are stored in water; phosphorus is a very reactive non-metal. It catches fire, if exposed in air. To prevent this, it is kept in water.

178. Sodium metal is kept in kerosene but not water. Why?

Ans. : Sodium is a highly reactive metal. When exposed to air, it starts to burn and forms sodium oxide. Similarly, it reacts vigorously with water. It does not react with kerosene. Therefore, to prevent its exposure to moisture and air, it is kept in kerosene.

179. Write a short note on elements.

Ans. : An element is a substance that cannot be broken down into simpler substances. They are the building blocks of all matter. Presently, there are 118 elements known. Some of them are naturally occurring, while some others are artificially made in laboratories. Metals and non-metals are the sub-categories of elements. Most of the elements are metals.

180. What is corrosion? Give two examples.

Ans. : Corrosion is the gradual destruction of metals by chemical reactions with substances like air, water, or acids.

Two examples of corrosion are: rusting of iron and tarnishing of silver.

181. What is rusting? How can it be prevented?

Ans. : Rusting is the corrosion of iron when it reacts with water and oxygen to form hydrated iron oxide.

It can be prevented by painting, oiling, greasing, or galvanizing the iron.

182. Write any five uses of non-metals in everyday life.

Ans. : Write any five uses of non-metals in everyday life are:

1. Oxygen is used for breathing and medical purposes.
2. Nitrogen is used in making fertilizers.
3. Sulphur is used in making matches and gunpowder.
4. Carbon is used in pencils (as graphite) and fuels.
5. Chlorine is used to purify water.

* consists of questions of 3 marks each.

[30]

183. Read the passage and answer the questions :

Anandi watched Sudarshan uncle beating a red-hot piece of iron to make a tool. She noted that it became flat without breaking and retained its shine even after hammering.

Q.1. Which property was she observing?

- (a) Lustre (b) Malleability
(c) Ductility (d) Sonority

Q.2. Why was iron chosen?

- (a) It is soft (b) It is malleable
(c) It is colourful (d) It melts quickly

Q.3. What would happen if he used sulphur instead?



- (a) It would flatten (b) It would melt
(c) It would break (d) It would shine

Ans. : (b) Malleability

- (b) It is malleable
(c) It would break

184. Read the passage and answer the questions :

A student is conducting an experiment to observe the reaction of magnesium ribbon when it is burned in air. The student first cleans a small piece of magnesium ribbon using sandpaper and then ignites it using a flame. The ribbon burns with a dazzling white flame, and a white powdery substance is formed after the reaction. The student records these observations and continues to investigate the nature of the product formed by adding a small amount of water to the white powder.

Q.1. What is the white powder formed after burning magnesium ribbon?

- (a) Magnesium sulphate
(b) Magnesium oxide
(c) Magnesium hydroxide
(d) Magnesium carbonate

Q.2. Which of the following will most likely happen after magnesium ribbon burns?

- (a) The product will turn blue litmus paper red
(b) The product will turn red litmus paper blue
(c) The product will have no effect on litmus paper
(d) The product will blue litmus paper red as well as red litmus paper blue

Q.3. What is the result of adding water to magnesium oxide?

- (a) It forms an acidic solution
(b) It forms a basic solution
(c) It forms a neutral solution
(d) It does not react with water

Ans. : (b) Magnesium oxide

- (b) The product will turn red litmus paper blue
(b) It forms a basic solution

185. Draw and colour a picture showing items made from metals and non-metals in your home.

Ans. : self

186. Create a table comparing five properties of metals and non-metals.

Ans. :

Property	Metals	Non-metals
Lustre	Generally lustrous (shiny)	Generally non-lustrous (dull)



Malleability	Malleable (can be hammered into sheets)	Non-malleable (brittle, breaks easily)
Ductility	Ductile (can be drawn into wires)	Non-ductile (cannot be drawn into wires)
Heat Conduction	Good conductors of heat	Poor conductors of heat
Electrical Conduction	Good conductors of electricity	Poor conductors of electricity

187. Hands-on Experiment: Test conductivity using a battery, wire, bulb, and materials like metallic foil, wood, rubber, and record results. Draw circuit diagram and fill observation table.

Ans. : self

188. How do the different properties of metals and non-metals determine their uses in everyday life?

Ans. : Metals and non-metals have various properties that make them useful in our everyday life.

Metals:

- Metals are malleable, for example, aluminium foil is used for wrapping food.
- Metals are ductile, wires made of copper or aluminium are used in electrical fittings.
- Metals are sonorous, they produce a ringing sound.
- Metals are good conductors of heat, so they are used in making cooking vessels.
- Metals are good conductors of electricity, making them ideal for electrical wires.

Non-metals:

- Generally non-metals are poor conductor of heat and electricity; for example, sulphur and carbon are used in insulating materials to prevent the transfer of heat or electricity.
- Non-metals are brittle: for example, sulphur and phosphorus are often used in matchsticks as they break easily or react quickly.
- Non-metals are gaseous at room temperature: for example, oxygen is essential for breathing.
- Non-metals are non-lustrous: carbon (as graphite) are used in pencils and dry cell batteries.

189. Complete the following table on the basis of appearance and hardness of the materials:

Object/Material	Appearance (Shiny/Dull)	Hardness (hard/not hard)
Iron		
Coal		
Sulphur		

Aluminium		
Copper		

Ans. :

Object/Material	Appearance (Shiny/Dull)	Hardness (hard/ not hard)
Iron	Shiny	Hard
Coal	Dull	Not hard
Sulphur	Dull	Not hard
Aluminium	Shiny	Hard
Copper	Shiny	Hard

190. Rahul left his bicycle outside in the garden during the rainy season. After a few weeks, he noticed that the handle and chain of the bicycle had developed a reddish-brown layer. His science teacher told him that this is a common problem with iron objects and explained how to prevent it.

Q.1. What is the reddish-brown substance seen on the bicycle called?

Q.2. What are the two conditions required for rusting of iron?

Q.3. Name two methods that Rahul can use to prevent the rusting of his bicycle.

Ans. : 1. Rust

2. Presence of air (oxygen) and moisture (water)

3. Painting and oiling

191. Rohan visited a jewelleiy shop with his parents. He noticed that most ornaments were made of gold and silver. The shopkeeper told them that these metals are used not only because they look beautiful but also because they can be easily shaped into different designs.

Q.1. Name the property of metals that allows them to be beaten into thin sheets.

Q.2. What did Rohan notice about most of the ornaments in the shop?

Q.3. Which of the two metals, gold or silver is more ductile?

Ans. : 1. Malleability

2. They were made of gold and silver.

3. Gold

192. Explain the physical properties of metals with examples.

Ans. : The physical properties of metals are:

1.Malleability – Metals can be hammered into thin sheets.

Example: Gold can be made into thin foil.

2.Ductility – Metals can be drawn into wires.

Example: Copper can be made into wires.

3.Luster – Metals have a shiny surface.

Example: Silver and aluminum are shiny.

4.Conductivity – Metals conduct heat and electricity.

Example: Copper conducts electricity.



5.Sonority – Metals produce a ringing sound when struck.

Example: Iron and brass are sonorous.

* consists of questions of 5 marks each.

[45]

193. Explain the experiment to show rusting of iron.

Ans. : Aim: To demonstrate the rusting of iron.

Materials Required:

- Clean iron nails
- Two test tubes
- Water
- Oil
- Cotton
- Labels

Procedure:

- Take three clean iron nails.
- In the first test tube, put a nail and add water, leaving it open to air.
- In the second test tube, put a nail and cover it with oil to prevent contact with air.
- In the third test tube, put a nail and cover it with dry cotton to prevent contact with water.
- Leave all the test tubes undisturbed for a few days.
- Observe the nails after some days.

Observations:

- The nail in the first test tube develops rust (reddish-brown coating).
- The nail in the second test tube remains unchanged because water is not in contact.
- The nail in the third test tube also remains unchanged because moisture is absent.

Conclusion:

- Rusting of iron occurs only in the presence of both air (oxygen) and water.
- Preventing either air or water can stop rusting.

194. Describe the physical properties of metals.

Ans. : Metals exhibit several distinct physical properties that make them useful for various applications. These properties include:

Lustre: Metals are generally lustrous, meaning they have a shiny surface when freshly cut or polished. This is due to the way metals interact with light.

Malleability: Metals are malleable, which means they can be hammered into thin sheets without breaking.

Ductility: Metals are ductile, meaning they can be drawn into thin wires. This property is essential for electrical wiring.

Sonority: Metals are sonorous, which means they produce a ringing sound when struck.



Heat and Electrical Conductivity: Metals are good conductors of heat and electricity. This is why they are used in cooking utensils and electrical circuits.

195. Illustrate how metals and non-metals are classified based on conduction.

Ans. : Metals and non-metals differ significantly in their ability to conduct electricity and heat, which is a key factor in their classification. Metals are generally excellent conductors of both electricity and heat, while non-metals are typically poor conductors.

Metals: Metals have a unique atomic structure that allows electrons to move freely. These free electrons can easily carry electrical charge or thermal energy through the material. Metals like copper, aluminum, and iron are widely used in electrical wiring and cooking utensils because of their high conductivity.

Non-metals: Non-metals lack the free electrons that metals possess. As a result, they do not conduct electricity or heat efficiently. Materials like wood, plastic, and rubber are used as insulators in electrical applications and as handles for cookware to prevent the flow of electricity or heat.

196. How can rusting be prevented? Give any three methods.

Ans. : Rusting can cause significant damage to iron structures, but fortunately, there are several ways to prevent it. Here are three common methods:

1. Painting:

Painting iron surfaces is one of the simplest and most widely used methods. The paint creates a barrier that prevents air and moisture from coming into contact with the iron.

2. Oiling and Greasing:

Applying a layer of oil or grease on iron surfaces also helps prevent rusting. Like paint, oil and grease create a protective layer that keeps moisture and air away from the metal.

3. Galvanization:

Galvanization involves coating iron with a thin layer of zinc. Zinc is more reactive than iron, so it corrodes first, protecting the iron underneath. Even if the zinc coating is scratched, it continues to protect the iron.

197. Explain how sonority and conductivity help in daily life.

Ans. : → Sonority and conductivity are two key properties that significantly impact our daily experiences.

→ Sonority, the ability to produce a ringing sound when struck, is utilized in creating musical instruments like bells, cymbals, and xylophones, enriching our lives with music.

→ It is also crucial in safety applications, such as alarm clocks, emergency sirens, and school bells, which rely on loud, clear sounds to alert people.

→ Conductivity, the ability to conduct heat and electricity, is equally vital. Metals like copper and aluminum are used in electrical wiring and appliances, ensuring efficient



power distribution and operation of electronic devices.

→ In cooking, conductive materials like stainless steel and copper are used in pots and pans to evenly distribute heat, improving cooking efficiency.

198. Discuss the role of non-metals in medical and agricultural fields.

Ans. : → Non-metals are indispensable in both medical and agricultural fields due to their unique properties. In medicine, oxygen is vital for respiration, enabling life itself.

→ Chlorine is widely used for water purification, ensuring access to safe drinking water. Iodine, another essential non-metal, is applied as an antiseptic to prevent infections.

→ In agriculture, nitrogen is a key component in fertilizers, promoting healthy plant growth and increasing crop yields.

→ Phosphorus and potassium, also non-metals, are essential nutrients that support plant development and overall soil health.

→ Without these non-metals, modern medical practices and agricultural productivity would be significantly compromised.

199. Observation : Table : Appearance, hardness, and effect of hammering on different objects or materials

Object/Material	Appearance (lustrous/non-lustrous)	Hard/Soft	Effect of hammering (fattens/ breaks into pieces)
Piece of copper			
Piece of aluminium			
Iron nail			
Piece of coal			
Lump of sulphur (pea-sized)			
Block of wood			

Ans. :

Object/Material	Appearance (lustrous/non-lustrous)	Hard/Soft	Effect of hammering (fattens/ breaks into pieces)
Piece of copper	Lustrous	Hard	Flattens
Piece of aluminium	Lustrous	Hard	Flattens
Iron nail	Lustrous	Hard	Flattens
Piece of coal	Non-lustrous	Soft	breaks into pieces
Lump of sulphur (pea-sized)	Non-lustrous	Soft	breaks into pieces
Block of wood	Non-lustrous	Hard but not hard as metal	Neither flattens nor breaks into pieces



Conclusion : Materials like copper, aluminium and iron are lustrous, hard and can be flattened into thin sheets.

Materials like coal, sulphur are non-lustrous, soft and breaks into pieces. Wood is neither malleable nor brittle.

200. Observation: Table : Formation of brown deposit on iron nails

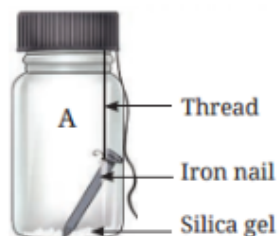


Fig. 4.4(a)

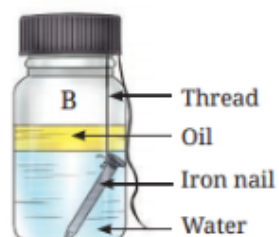


Fig. 4.4(b)

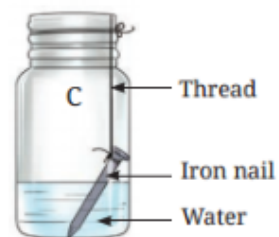


Fig. 4.4(c)

Glass Bottle	Conditions		Observations
	Presence of water (Yes/No)	Presence of air (Yes/No)	
A			
B			
C			

Ans. :

Glass Bottle	Conditions		Observations
	Presence of water (Yes/No)	Presence of air (Yes/No)	
A	No	Yes	No Brown deposit on iron nail
B	Yes	No	No Brown deposit on iron nail

C	Yes	Yes	Brown deposit on iron nail
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Conclusion : The presence of both air and water is essential for the brown deposit to be formed on iron (rusting of iron).

201. Write the differences between metals and non-metals on the basis of their physical properties.

Ans. :

Metals	Non-metals
1. Metals are lustrous.	1. Non-metals are usually non-lustrous.
2. Metals are hard, except sodium and potassium.	2. Non-metals are not hard.
3. Metals are solid, except mercury.	3. Non-metals can exist in all states.
4. Metals are malleable and ductile.	4. Non-metals are neither malleable nor ductile.
5. Metals are sonorous.	5. Non-metals are not sonorous.
6. Metals are good conductors of heat and electricity.	6. Non-metals are poor conductors of heat and electricity.

* Match the Following.

[20]

Column A	Column B
202. Materials which transfers heat	(a) Wood
203. Metal stored in kerosene	(b) Gold
204. Non-metal essential for life	(c) Sodium
205. Non-conductor of electricity	(d) Oxygen
	(e) Conductor

Ans. : (1-e,2-c,3-d,4-a)

Match the uses of metals and non-metals given in Column I with the jumbled names of metals and non-metals given in Column II.

Column I	Column II
206. Used in electrical wiring	A. ENXYGO
207. Most malleable and ductile	B. NECOHIRL
208. Living Organisms cannot survive without it.	C. PEPORC
209. Plants grow healthy when fertilisers containing it are added to the soil.	D. TENGOINR
	E. OGDL



Ans. :

Column I	Column II
1. Used in electrical wiring	C. PEPORC
2. Most malleable and ductile	E. OGDL
3. Living Organisms cannot survive without it.	A. ENXYGO
4. Plants grow healthy when fertilisers containing it are added to the soil.	D. TENGOINR

Column A	Column B
210. Oxygen wiring	A. Needed for growth
211. Carbon wounds	B. Antiseptic for
212. Chlorine and energy	C. Essential for
213. Iodine purification	D. Used in water

Ans. :

Column A	Column B
1. Oxygen wiring	C. Essential for
2. Carbon wounds	A. Needed for growth
3. Chlorine and energy	D. Used in water
4. Iodine purification	B. Antiseptic for

Column A	Column B
214. Metallic oxide	A. Liquid metal
215. Non-metallic oxide	B. Turns red litmus into blue
216. Basic solution	C. Acidic in nature
217. Mercury	D. Basic in nature

Ans. :

Column A	Column B
1. Metallic oxide	D. Basic in nature
2. Non-metallic oxide	C. Acidic in nature
3. Basic solution	B. Turns red litmus into blue
4. Mercury	A. Liquid metal

Column A	Column B
218. Malleability	A. Shiny appearance of metals
219. Brittleness	B. Produces ringing sound when struck
220. Lustre	C. Property of being broken into pieces
221. Sonority	D. Property of being beaten into sheets



Ans. :

Column A	Column B
1. Malleability	D. Property of being beaten into sheets
2. Brittleness	C. Property of being broken into pieces
3. Lustre	A. Shiny appearance of metals
4. Sonority	B. Produces ringing sound when struck

