

**Very Short Answer Type Questions**

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**1. State whether the following statement is true or false:****Milk is a pure substance.****Solution:**

False. Milk is not a pure substance. It contains many ingredients.

**2. Name three mixtures found in nature.****Solution:**

Milk, Paint, and Glass are three mixtures found in nature.

**3. Which of the following is a mixture?****Salt, Air, Water, Alum, Sugar****Solution:**

Air is a mixture as it is composed of different gases.

**4. Name one metal and one non-metal which exist as liquids at room temperature.****Solution:**

Mercury is a liquid metal, and bromine is a liquid non-metal which exists as liquids at room temperature

**5. Name a metal which is soft and a non-metal which is hard.****Solution:**

Sodium is a soft metal, and diamond is an extremely hard non-metal which is the allotrope of carbon.

**6. Name a non-metal which is a good conductor of electricity.****Solution:**

Diamond is a non-metal, which is extremely hard and a good conductor of electricity.

**7. Name a liquid which can be classified as a pure substance and conducts electricity.****Solution:**

Mercury is a liquid metal that can be classified as a pure substance and conducts electricity.

**8. Name one solid, one liquid and gaseous non-metal.**

**Solution:**

Carbon is a solid non-metal, Bromine is a liquid non-metal and chlorine is a gaseous non-metal.

**9. Name the property:**

**(a) Which allows metals to be hammered into thin sheets?**

**(b) Which enables metals to be drawn into wires.**

**Solution:**

(a). Malleability is the property of metals to be hammered into thin sheets.

(b). Ductility is the property to enable metals to be drawn into wires.

**10. Which type of elements, metal or non-metals, show the property of brittleness?****Solution;**

Non-Metals show brittleness because they are hard but liable to break easily.

**11. What is meant by saying that metals are malleable and ductile?****Solution:**

Malleability is the property of metals to be hammered into thin sheets. Ductility is the property to enable metals to be drawn into wires.

**12. What is meant by saying that non-metals are brittle?****Solution:**

Non-metals are brittle because they are hard but are liable to break easily.

**13. What is meant by saying that metals are sonorous?****Solution:**

Metals are sonorous because they make sound when we strike on them.

**14. What is meant by saying that metals are lustrous?****Solution:**

Metals are lustrous because they are shining in nature.

**15. What is the general name of the materials which contain at least two pure substances and show the properties of the constituents?**

**Solution:**

Mixtures are materials which contain at least two pure substances and show the properties of the constituents.

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**16. “The properties of the product are different from those of the constituents”. State whether this statement best describes an element, a compound or a mixture.**

**Solution:**

The given statement best describes a compound having different properties from those of its constituents.

**17. Name one element, one compound and one mixture.**

**Solution:**

Sulphur is an element, water is a compound, and air is a mixture.

**18. What is the major difference between a solution and an ordinary mixture?**

**Solution:**

Mixtures consist of two or more constituents in any proportion which is either distinct or indistinct. Whereas solutions are homogenous mixture which is completely mixed and can be separated.

**19. What name is given to those elements which are neither good conductors of electricity, like copper, nor insulators, like sulphur?**

**Solution:**

Metalloids are those elements which are neither good conductors of electricity, like copper, nor insulators, like sulphur.

**20. Fill in the following blanks with suitable words:**

(a) An element is made up of only one kind of \_\_\_\_\_.

(b) Brine is a \_\_\_\_\_ whereas alcohol is a \_\_\_\_\_.

(c) Brass is an alloy which is considered a \_\_\_\_\_.

(d) The three important metalloids are \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.

(e) The elements which are sonorous are called \_\_\_\_\_.

**Solution:**

- (a) An element is made up of only one kind of **atom**.
- (b) Brine is a **mixture**, whereas alcohol is a compound.
- (c) Brass is an alloy which is considered a **mixture**.
- (d) The three important metalloids are **boron, silicon** and **germanium**.
- (e) The elements which are sonorous are called **metals**.

**Short Answer Type Questions**

**21. Classify the following into elements and compounds:**

(i)  $H_2O$  (ii) He (iii)  $Cl_2$  (iv) CO (v) Co

**Solution:**

- (i).  $H_2O$  – Compound
- (ii). He – Element
- (iii).  $Cl_2$  – Element
- (iv). CO – Compound
- (v). Co – Element

**22. Classify the following as elements or compounds:**

**Iron, Iron sulphide, Sulphur, Chalk, Washing soda, Sodium, Carbon, Urea**

**Solution:**

Elements – Iron, Sulphur, Sodium and Carbon

Compounds – Iron sulphide, Chalk, Washing Soda and Urea.

**23. What elements do the following compounds contain?**

**Sugar, Common salt**

**Solution:**

Sugar contains Carbon, hydrogen and oxygen.

Common salt comprises of sodium and chlorine

**24. What are pure substances? Give two examples of pure substances.**

**Solutions:**

A pure substance is made up of the same type of particles or atoms. All the elements and compounds are pure substances because they contain the same kind of particles

Examples: Hydrogen and carbon dioxide.

**25. What are the two types of pure substances? Give one example of each type.**

**Solution:**

(i) Pure substances which are made up of the same kind of atoms

Example: Sulphur

(ii) Pure substances which are made up of the same kind of molecules

Example: Water.

**26. Which of the following are 'pure substances'?**

**Ice, Milk, Iron, Hydrochloric acid, Calcium oxide, Mercury, Brick, Wood, Air**

**Solution:**

Ice, iron, hydrochloric acid, calcium oxide and mercury are pure substances.

**27. What is the other name for impure substances? Give two examples of impure substances.**

**Solution:**

Another name for an impure substance is Mixture.

Examples: Milk and seawater.

**28. Which of the following substances are elements?**

**Water, Salt, Mercury, Iron, Marble, Diamond, Wood, Nitrogen, Air, Graphite, Hydrogen, Oxygen, Sugar, Chlorine**

**Solution:**

Elements are Mercury, Iron, Diamond, Nitrogen, Graphite, Hydrogen, Oxygen and chlorine.

**29. State three reasons why you think air is a mixture and water is a compound.**

**Solution:**

Air is a mixture because

1. It contains two or more pure substances
2. By physical processes, it can be separated into a simpler substance
3. Its composition is not fixed

Water is a compound because

1. Its composition is fixed and inseparable
2. It has a definite formula and is present in proportion to mass.

**30. Name two solid, liquid and two gaseous elements at room temperature.**

**Solution:**

Two solid elements at room temp. – Iron and copper

Two liquid elements at room temp. – Mercury and bromine

Two gaseous elements at room temp. – Hydrogen and oxygen

**31. Explain why hydrogen and oxygen are considered elements, whereas water is not considered an element.**

**Solution:**

Hydrogen and oxygen are considered as elements which cannot split into different substances by applying any kind of energy like heat or electricity, whereas water is composed of constituents like hydrogen and oxygen in a fixed proportion and can be split up by applying energy. So, it is not an element.

**32. What are the three groups into which all the elements can be divided? Name two elements belonging to each group.**

**Solution:**

Elements can be divided into metals, non-metals and metalloids.

Metals: Aluminium and copper

Non-metals: Potassium and calcium

Metalloids: Arsenic and antimony

**33. State two physical properties on the basis of which metals can be distinguished from non-metals.**

**Solution:**

Metals are malleable and ductile that is, they can be drawn to thin wires and can be hammered, but non-metals are neither malleable nor ductile.

**34. Compare the properties of metals and non-metals with respect to (i) malleability (ii) ductility, and (iii) electrical conductivity.**

**Solution:**

(i). Malleability – Metals show this property, but non-metals don't.

(ii). Ductility – Metals show this property, but non-metals don't.

(iii). Electrical conductivity – Metals are good conductors of electricity, whereas non-metals are bad conductors except graphite.

**35. State any two properties for believing that aluminium is a metal.**

**Solution:**

Metals are malleable, ductile and sonorous. Therefore aluminium can be considered as a metal because it possesses these properties.

**36. Give reason why:**

**(a)Copper metal is used for making electric wires.**

**(b)Graphite is used for making electrodes in a dry cell.**

**Solution:**

(a) Copper can be used for making electric wires because they are ductile in nature, as copper is a metal.

(b) Graphite is a non-metal which has the property to conduct electricity and can be used to make electrodes

**37. How would you confirm that a colourless liquid given to you is pure water?**

**Solution:**

We boil the colourless liquid, and if it starts boiling at 100°C, then it might be water. We can check it by checking reactivity with some metals that react violently with water.

**38. Choose the solutions from among the following mixtures:**

**Soil, Seawater, Air, Coal, Soda water**

**Solutions:**

Solutions are seawater and soda water, and the remaining is mixtures.

**39. Is air a mixture or a compound? Give three reasons for your answer.**

**Solution:**

Air is a mixture because

1. Its constituents can be separated example: oxygen, nitrogen etc., by physical process
2. It does not have a fixed boiling point
3. Air shows properties that are the same as the constituent gases present in it.

**40. Give two reasons for supposing that water is a compound and not a mixture.**

**Solutions:**

Water is a compound because

1. Its composition is fixed, and it is inseparable
2. The property of water is different from its constituents

**41. Define a compound. Give two points of evidence to show that sodium chloride is a compound.**

**Solution:**

A chemical compound is a substance made up of two or more elements combined together chemically in a fixed proportion by mass.

Sodium chloride is a compound because

1. It consists of two elements, sodium and chlorine, and the product formed from these is different from the constituent elements.
2. It has a fixed proportion of constituents by mass.

**42. Define a mixture. Give two points of evidence to show that sugar solution is a mixture.**

**Solution:**

A mixture consists of two or more different kinds of particles or substances but not chemically bound.

The sugar solution is a mixture because

1. It can be separated into its constituents, like sugar and water, by physical processes.
2. It shows both the property of water and sugar.

**43. State two reasons for supposing that brass is a mixture and not a compound.**

**Solution:**

Brass is a mixture because

1. It does not have a fixed composition



2. It shows the properties of its constituents.

**44. List five characteristics by which compounds can be distinguished from mixtures.**

**Solution:**

Mixtures	Compounds
1. They are impure substances	1. They are pure substances
2. It can be separated into constituents by the physical processes	2. Compounds cannot be separated into its constituents by physical processes
3. Shows the properties as that of its constituents	3. The properties of a compound are entirely different from its constituents
4. The composition is variable	4. The composition is fixed
5. It does not have a fixed melting point or boiling point.	5. It has a fixed melting and boiling point.

**45. Explain why a solution of salt in water is considered a mixture and not a compound.**

**Solution:**

The solution of salt in water is considered as a mixture because the salt solution is made up of salt and water

1. The constituents of the salt solution might be variable
2. It does not have a fixed ratio, and properties depend upon the nature of its components.
3. The constituents of the salt solution can be separated

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**46. State one property in which a solution of sugar in water resembles a mixture of sugar and sand, and one property in which it differs from it.**

**Solution:**

Both can be separated into their constituents by physical methods, and the difference is that the separation is not visible in the mixture of sugar and water, whereas in sugar and sand, the separation is visible.

**47. You are given two liquids, one a solution and the other a compound. How will you distinguish the solution from the compound?**

**Solution:**

We can distinguish a solution from a compound by the process of distillation. The constituents can be separated by distillation, but for a compound, it is not possible.

**48. Name a non-metal:**

(a) Which is lustrous?

(b) Which is required for combustion?

(c) Whose one of the allotropic forms is a good conductor of electricity? Name the allotrope.

(d) Other than carbon which shows allotropy

(e) Which is known to form the largest number of compounds?

**Solution:**

(a). Iodine is a lustrous non-metal.

(b). Oxygen is a non-metal required for combustion.

(c). Graphite is an allotrope of carbon and a good conductor of electricity

(d). Silicon

(e). Carbon

**49. Name a metal:**

(a) Which can be easily cut with a knife

(b) Which forms amalgams

(c) Which has no fixed shape

(d) Which has a low melting point

(e) Which is yellow in colour

**Solution:**

(a). Sodium

(b). Mercury

(c). Mercury

(d). Sodium

(e). Gold

**50. Which of the following are not compounds?**

**Chlorine gas, potassium chloride, Iron powder, Iron sulphide, Aluminium foil, Iodine vapour, Graphite, Carbon monoxide, Sulphur powder, Diamond**

**Solution:**

Chlorine gas, Aluminium foil, Iodine vapour, Graphite, Sulphur powder, and Diamond are not compounds

**Long Answer Type Questions**

**51. (a) State the main points of difference between homogeneous and heterogeneous mixtures.**

**(b) Classify the following materials as homogeneous mixtures and heterogeneous mixtures.**

**Soda-water, Wood, Air, Soil, Vinegar, Alcohol and water mixture, Petrol and water mixture, Chalk and water mixture, Sugar and water mixture, Copper sulphate solution.**

**Solution:**

(a)

Homogenous mixture	Heterogeneous mixture
1. A substance that is uniform in composition	1. Composition is not uniform
2. It has a single phase	2. More than two phases
3. Sugar solution and salt solution are examples	3. Sugar solution and sand solution are examples

(b) . Homogeneous mixtures – Soda water, air, vinegar, alcohol and water mixture, sugar and water mixture, Copper sulphate solution.

Heterogeneous mixture – Wood, petrol and water mixture, chalk and water mixture.

**52. (a) What is meant by (i) elements (ii) compound, and (iii) mixtures? Write down the names of two elements, two compounds and two mixtures.**

**(b) Classify the following into elements, compounds and mixtures:**

**Marble, Air, Gold, Brass, Sand, Diamond, Graphite, Petroleum, Common salt, Sea-water, Chalk**

**Solution:**

(a)(i) Element: A substance that cannot split into two or more simpler substances by chemical methods. Examples: carbon and oxygen are non-metals, aluminium and copper are metals

(ii) Compound: It is a substance consisting of two or more elements combined chemically in a fixed proportion by mass.

Example: Water and sodium chloride

(iii) Mixture: A mixture is a substance that is made up of two or more particles or substances mixed by physical process.

Examples are Milk and wood

(b) Elements – Gold, Diamond, Graphite

Compounds – Common salt, Sea water, Marble

Mixtures – Brass, Sand, Petroleum, Chalk, Air

**53. (a) What are (i) metals (ii) non-metals, and (iii) metalloids? Give two examples each of metal, non-metals and metalloids.**

**(b) Classify the following into metals, non-metals and metalloids:**

**Silicon, Mercury, Diamond, Sulphur, Iodine, Germanium, Sodium, Carbon, Magnesium, Copper, Boron, Helium**

**Solution:**

(a)(i) Metals are elements that are malleable, ductile and conduct electricity.

Example: Aluminium and zinc

(ii) Non-metals are elements that are neither malleable nor ductile, and they do not conduct electricity. But most of the non-metals are brittle

Examples: Phosphorus and hydrogen

(iii) Metalloids are the elements that show properties of both metals and non-metals

Examples: Germanium and silicon.

(b) Metals – Mercury, Sodium,

Non-metals – Diamond, Sulphur, Iodine, Carbon, Boron

Metalloids – Silicon, Germanium

**54. (a) What is a mixture? Give two examples of mixtures.**

**(b) What is meant by (i) homogeneous mixtures, and (ii) Heterogeneous mixtures? Give two examples of homogeneous mixtures and two of heterogeneous mixtures.**

**(c) What is the other name of homogenous mixtures?**

**Solutions:**

(a) Mixtures are substance that contains two or more different kinds of particles or substances mixed together by physical methods

Example: Air and brick

(b)(i) Homogenous mixtures are completely mixed together with the constituents and are indistinguishable.

Examples are sugar solution and salt solution.

(ii) Heterogeneous mixtures: The mixtures in which the constituting substances remain separated and one substance is spread throughout the other substance as small particles

Examples are starch solution and soap solution

(c) Other name for homogeneous mixtures is solutions.

**55. (a) What are the three general classes of matter? Give one example of each type.**

**(b) Draw a flow chart for the schematic representation of different types of matter.**

**Solution:**

**(a). Three general classes of matter are elements, compounds and mixtures.**

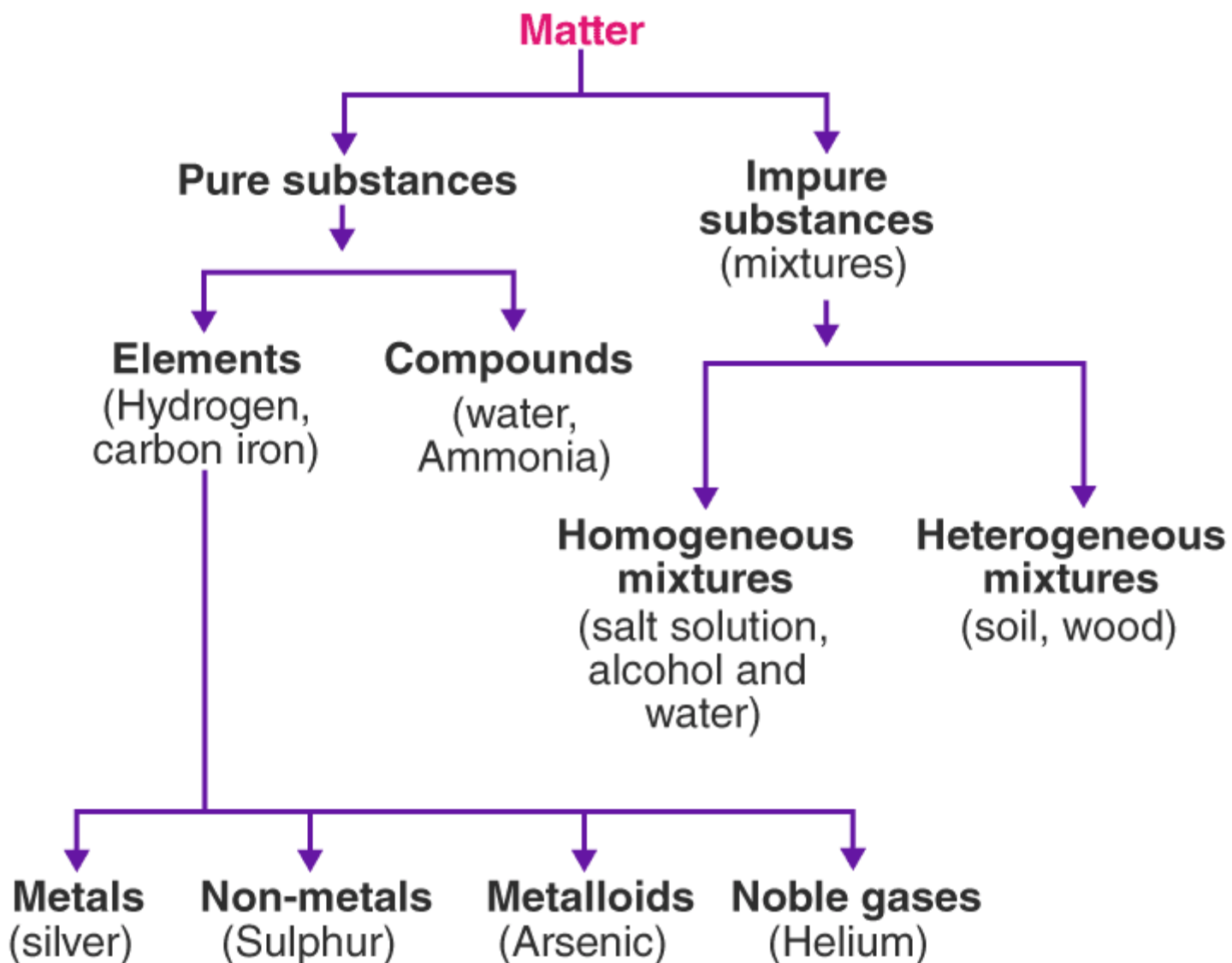
**Element – Aluminium**

**Compound – Sodium chloride**

**Mixtures – Sugar solution**

(b)





Multiple Choice Questions (MCQs)

56. Which of the following is not an element?

- (a) Graphite
- (b) Germanium
- (c) Silica
- (d) Silicon

**Solution:**

Option (c) is the answer

**57. Which of the following are compounds?**

(i) CO (ii) No (iii) NO (iv) Co

(a) (i) and (ii)

(b) (ii) and (iii)

(c) (i) and (iii)

(d) (ii) and (iv)

Option (c) is the answer

**58. One of the following substances is neither a good conductor of electricity nor an insulator. This substance is:**

(a) Chromium

(b) Germanium

(c) Gallium

(d) Potassium

**Solution:**

Option (b) is the answer.

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**59. Which of the following is not a mixture?**

(a) Kerosene

(b) Air

(c) Alcohol

(d) Petrol

**Solution:**

Option (c) is the answer.

**60. The element which is not common between the compounds called baking soda and soda ash is:**

- (a) Sodium
- (b) Hydrogen
- (c) Oxygen
- (d) Carbon

**Solution:**

Option (b) is the answer.

**61. "Is malleable and ductile" best describes:**

- (a) A solution
- (b) A metal
- (c) A compound
- (d) A non-metal

**Solution:**

Option (b) is the answer.

**62. Which one of the following is not a metalloid?**

- (a) Boron
- (b) Silicon
- (c) Gallium
- (d) Germanium

**Solution**

Option (c) is the answer.

**63. The elements which normally exist in the liquid state are:**

- (a) Bromine and Iodine
- (b) Mercury and chlorine
- (c) Iodine and mercury
- (d) Bromine and mercury

**Solution:**

Option (d) is the answer.



64. When a mixture of iron powder and sulphur powder is heated strongly to form iron sulphide, then heat energy is:

- (a) Released
- (b) First absorbed and then released
- (c) Absorbed
- (d) Neither absorbed nor released

**Solution:**

Option (b) is the answer.

65. The property/properties which enable the copper metal to be used for making electric wires is/are:

- (a) Copper metal is malleable and ductile
- (b) Copper metal is a good conductor of electricity
- (c) Copper metal is ductile and has a low electrical resistance
- (d) Copper metal is sonorous and an excellent conductor of electricity

**Solution:**

Option (c) is the answer.

66. On the basis of the composition of matter, milk is considered to be:

- (a) A pure substance
- (b) An impure substances
- (c) An element
- (d) A compound

**Solution:**

Option (b) is the answer.

67. Which of the following statement are true for pure substances?

- (i) Pure substances contain only one kind of particles
- (ii) Pure substances may be compounds or mixtures
- (iii) Pure substances have the same composition throughout

(iv) Pure substances can be exemplified by all elements other than nickel

- (a) (i) and (ii)
- (b) (i) and (iii)
- (c) (iii) and (iv)
- (d) (ii) and (iii)

**Solution:**

Option (b) is the answer.

**68. Which of the following are homogenous in nature?**

- (i) Ice (ii) wood (iii) Soil (iv) Air
- (a) (i) and (iii)
  - (b) (ii) and (iv)
  - (c) (i) and (iv)
  - (d) (iii) and (iv)

**Solution:**

Option (c) is the answer.

**69. Two chemical substances, X and Y, combine together to form a product P which contains X and Y**



X and Y cannot be broken down into simpler substances by simple chemical reactions. Which of the following statements concerning X, Y and P are correct?

- (i) P is a compound
  - (ii) X and Y are compounds
  - (iii) X and Y are elements
  - (iv) P has a fixed composition
- (a) (i), (ii) and (iii)
  - (b) (i), (ii) and (iv)
  - (c) (ii), (iii) and (iv)
  - (d) (i), (iii) and (iv)

**Solution:**

Option (d) is the answer.

**70. Which of the following does not have a fixed melting point/boiling point?**

- (a) Gold
- (b) Ethanol
- (c) Air
- (d) Oxygen

**Solution:**

Option (c) is the answer.

