PHYSICS

BOOKS - PEARSON IIT JEE FOUNDATION

MYSTERY OF MATTER

Solved Ex

1. Two substances X and Y have many free surfaces. They are subjected to heating. After heating. X is converted to another state which has one free surface and Y is converted to another state which has no free surfaces. Comment on the nature of X and Y.

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2. A solid X floats on water, but sinks in another liquid. And x solid Y floats on water but also floats on another liquid. A solid Z sinks both in water and also in another liquid Draw a comparison among the densities of X,Y and Z. and justify.

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3. Sodium is a soft metal and chlorine is a gaseous non-metal but soidum chloride is a brittle solid. Give reason.

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4. What is the advantage of distillation over evaporation? Under which conditions, they are preferntially used? Give suitable example.

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1. ___ is the process of change of the liquid state into vapour state.

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2. _____ is the temperature at which a liquid starts changing into gaseous state.

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3. The melting point of a solid has the same numerical value as the _____ of the liquid state of the same substance.

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4. The liquids and gases together are called _____

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5. Liquids have definite ___ but no definite _____.

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6. _____ acquires the volume of the container.

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7. ____ is the hardest natural material known.

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8. The process by which a gas chagnes into its liquids tate is called _____ .

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9. Which among the following substances fills up the entire space in the container?

A. Oxygen

B. Water

C. Oil

D. Naphthalene

Answer: A

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10. The condensation point of steam is__

A. $0^\circ C$

B. $100^\circ C$

C. $120^\circ C$

D. $150^\circ C$

Answer: B

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11. How many free surface are there in a gas?

A. Many

B. Zero

C. One

D. Depends on the nature of gas.

Answer: c

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12. Identify the conversion associated with decrease in intermolecular forces of attraction.

A. Steam-Water

B. Water-Ice

C. Dry ice-Carbon dioxide

D. None of these

Answer: C

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13. Identify a sublimable substance among the following

A. Wax

B. Ice

C. Dry ice

D. Steam

Answer: C

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14. Identify the odd one among the following

A. Potassium permanganate

B. Alum

C. Blue vitriol

D. Sand

Answer: D

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15. Identify the gas which is insoluble in water.

A. Oxygen

B. Methane

C. Carbon dioxide

D. All of these.

Answer: B

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16. ___ cannot be broken down into simpler substances.

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17. _____ is the smallest unit of an element.

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18. _____ is a liquid metal.

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19. _____ do not produce sound when struck.

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20. The gaseous elements that do not react chemically with the other elements are known as_____

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21. A _____ is the smallest unit of a compound.

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22. _____ can be heterogeneous or homogenous.

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23. Brass is a homogeneous mixture of _____ and _____.

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24. The lightest element in the periodic table is

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25. _____ and _____ are the most abundant elements present in the earth's crust.

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26. Identify the liquid non-metal among the following

A. Mercury

B. Iodine

C. Bromine

D. None of these

Answer: C

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27. Which of the following elements is not present in nitrogenous base?

A. Argon

B. Nitrogen

C. Oxygen

D. Ozone.

Answer: A

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28. Identify the number of noble gases.

A. 4

B. 6

C. 8

D. 10

Answer: B

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29. Identify the most abundant class of elements.

A. Metals

B. Non-metals

C. Metalloids

D. Inert gases

Answer: A

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30. Which among the following elements is abundant in human body?

A. Iron

B. Calcium

C. Oxygen

D. Carbon.

Answer: D

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31. Identify the metal which is non-malleable.

A. Carbon

B. Zinc

C. Lead

D. Platinum.

Answer: B

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32. Which among the following is a soft solid and has high melting point?

A. Diamond

B. Sodium

C. Chlorine

D. Sulphur

Answer: B

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33. Identify a compound among the following

A. Common salt

B. Air

C. Sugar

D. Diamond.

Answer: C

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34. Among the following, which is a metalloid?

A. Antimony

B. Carbon

C. Iodine

D. Mercury

Answer: A

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35. The total number of rare earth elements is

A. 116

B. 92

C. 100

D. 24

Answer: B

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36. Which of the following liquids can form a single layer when added to water?

A. Alcohol

B. Kerosene

C. Petrol

D. Mustard oil

Answer: A

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37. Which of the following types of mixtures is always homogeneous?

A. Liquid-Liquid

B. Gas-Gas

C. Solid-Solid

D. Solid-Liquid.

Answer: B

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38. Common salt can be separated from the sea water by the method of ___

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39. A mixture of sodium chloride and ammonium chloride can be separated by ____ method.

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40. ____ is the chemical added to water to hasten the process of sedimenstation.

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41. An apparatus used for the purpose of centrifugation is called _____ .

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42. In a separating funnel, the _____ liquid forms the upper layer.

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43. The components of ink are separated by _____

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44. _____ liquids can be separated from their mixtures by the method of distilation.

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45. Solid-solid mixture are mostly_____

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46. Different sized pearls are separated by jewellers by the process of _____ .

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47. Rice grains and husk can be separated by the method of___.

A. Sieving

B. Hand picking

C. By solvent

D. Winnowing.

Answer: D

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48. A mixture of chalk and water can be separated by

A. Sedimentation

B. Filtration

C. Loading

D. Decantation.

Answer: B

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49. Centrifugation can be used for the separation of

A. Components of ink

B. Sugar from sugar solution

C. Petrol from crude oil

D. Cream from milk.

Answer: D

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50. Distilled water cannot be used for which among the following purposes?

A. Drinking

B. Preparation of medicines.

C. Preparation of solutions in industries

D. None of these

Answer: A

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51. Finer clay particles from water can be separated by the process of

A. Sedimentation

B. Centrifugation

C. Loading

D. Distillation.

Answer: C

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52. The process of pouring out the clear water after setting down of the mud particles is called

A. Sedimentation

B. Decantation

C. Distilllation

D. Loading

Answer: B

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53. Identify the mixture in which the constituents cannot be separated by sublimation.

A. Naphthalene+sand

B. Iodine+Iron

C. Ammonium chloride + sand

D. Sulphur+Sand

Answer: D

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Short Ans

1. Define matter.

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2. What is meant by boiling point?

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3. How do you define interconversion of states of matter?

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4. Give example of substances which undergo sublimation.

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5. Two liquids A and B when mixed together formed two layers. Liquid C when added to B also formed two layers. However, A and C when mixed formed a single layer and also with water. How do you account for this?

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6. Name two opaque liquids.

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7. What is observed when glass and wood are placed in water in two containers? Give reason.

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8. Mention the inter-conversions associated with the following phenomena.

(a) Wet clothes are hanged on a string.

(b) Appearance of dew drops on the leaves on winter morning.

(c) Foggy appearance on a mirror when exhaled air is blown over it.

(d) Occurrence of snow fall.

(e) Reduction in size of naphthalene balls when placed in a cupboard.

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9. Water plays an important role in the functioning of our body Give reason.

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10. How are animals and plants able to survive in water?

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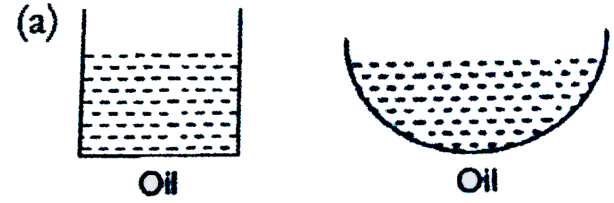
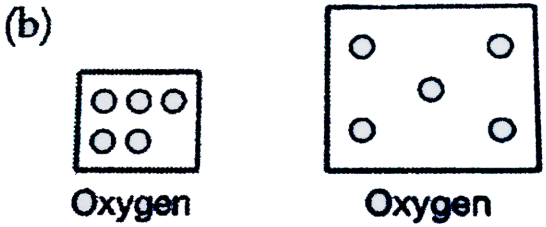
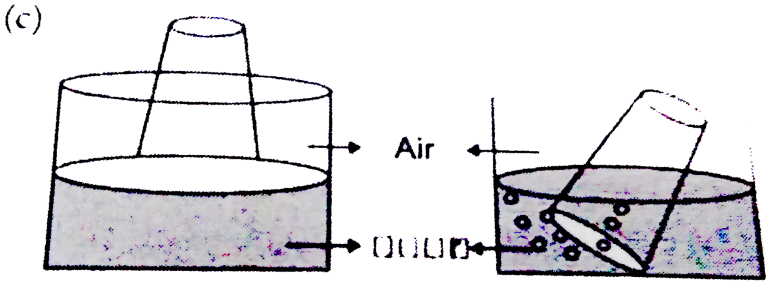
11. Observe the following figures and draw relevant conchusions regarding the properties of substances represented in the figures







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12. Give reasons for the following.

(a) Liquids can be taken in an open container while gas requires a closed container.

(b) Honey cannot be poured into another container as easily as water

(c) Gases flow more than liquids.

(d) As water is subjected to heating, its temperature increases and becomes constant at $100^{\circ}C$ even though water is still there in the container and the supply of heat is continued.

(e) When a solid substance is subjected to heating, it dissappears without leaving any liquid.

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13. When you come out of an AC car, foggy apperance is noticed on the spectacles. Give reason.

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14. Hot tea when poured into a saucer failates easy drinking. Justify.

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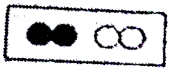
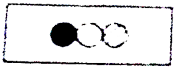
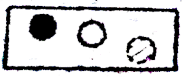
15. Match the following.

(A)		(i)	Elemental molecule
(B)		(ii)	Elemental atom
(C)		(iii)	Mixture of atoms
(D)		(iv)	Mixture of molecules
(E)		(v)	Compound of 2 elements
(F)		(vi)	Compound of 3 elements

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16. Define the following.

(a) Elements (b) Compound (c) Homogenous mixture (d) Heterogeneous mixture (e) Metalloids (f) Noble gases.

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17. Name the gaseous non-metallic elements and the solid non-metallic elements.

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18. Distinguish between metals and non-metals with respect to the following characteristics. (a) Melting and boiling points (b) conductivity (c) Malleability.

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19. Name the metalloids.

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20. Distinguish between elements and compounds.

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21. Identify the following.

(a) The gaseous compound of two non-metals required for photosynthesis.

(b) The compound of two non-metals which exists in all the three states under normal conditions.

(c) The metal which breaks into pieces on the application of force.

(d) The metal used in thermometers.

(e) The inert gas used in advertisement sign boards.

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22. X, Y and Z are three substance, On passage of electricity through X, two substances A and B are formed, Y is a liquid which on evaporation generates C as a residue and D was vaporized. Z could not be split up into any simpler substances further. A is found to be a good conductor of heat and electricity while B was found to be a gas. it is possible to split C and D

into simpler substances chemically. what do you infer regarding the nature of these substances with respect to composition?

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23. Sodium chloride is a compound is common salt a compound? Justify.

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24. Identify whether the following are elements or compounds or mixtures Give proper justification.

(a) Saline water (b) Tincture of iodine

(c) Distilled water (d) Potable water

(e) ozone (f) Sand (silicon dioxide)

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25. Mention the purposes for which separation of mixtures is important Give examples.

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26. The principle of separation of a mixture depends on which factors?

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27. Alum increases the rate of sedimentation. Why?

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28. Methods of Separation: Sieving, Sedimentation, Decantation, Filteration, Evaporation

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29. Explain how it is possible to separate gold from river sand.

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30. Differentiate between residue and filtrate.

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31. Explain the principle involved in centrifugation.

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32. Which method is employed for the separation of constituents from a heterogeneous liquid-liquid mixture? Explain the principle involved.

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33. Name the process you would use to separte a mixture of water and alcohol.

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34. A mixture of iron filings, saw dust and sugar is available . Explain the methods of separation of these constituents.

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35. Explain the principle invovled in the making of coffee decoction.

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Concept App

1. In which among the follwowing situations evaporation causes cooling is not exploited?

A. We sweat to cool bodies

B. Occurrence of snowfall

C. Stretching out of tongues by dogs during summer

D. Usage of earthen pots.

Answer: B

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2. A mixture contains camphor powder, sand, iron powder and common salt, Identify the separation methods that are employed to separate the constituetns from the mixture.

A. Magnet separation, sublimation, addition of water followed by filtration, evaporation.

B. Handpicking, sieving, addition of water followed by filtration, evaporation.

C. Magnet separation, sieving,addition of water followed by filtration, evaporation

D. Magnet separation, sublimation, sedimentation and decantation, evaporation.

Answer: A

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3. Identify the substances which undergo sublimation.

A. Incense stick and camphor

B. Perfume and dry ice

C. Perfume and incense stick

D. Odonil and dry ice

Answer: D

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4. Identify the false statement among the following

A. Every compound is a pure substance.

B. Pure substances are homogeneous in nature.

C. Mixtures have fixed composition.

D. Formation of compound invovles energy change.

Answer: C

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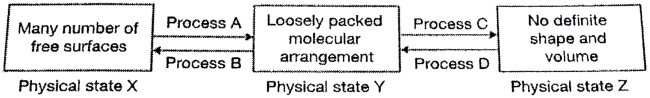

Identify the incorrect option from the following based on the diagram given above:

Option	A	B	C	D
(a)	Melting	Freezing	Boiling	Condensation
(b)	Freezing	Melting	Condensation	Boiling
(c)	Boiling	Melting	Freezing	Condensation
(d)	Melting	Condensation	Boiling	Freezing

5.

Identify the incorrect option from the following based on the diagram given above.

A. $\underset{\text{Melting}}{A}\quad\underset{\text{Freezing}}{B}\quad\underset{\text{Boiling}}{C}\quad\underset{\text{Condensation}}{D}$

B. $\underset{\text{Freezing}}{A}\quad\underset{\text{Melting}}{B}\quad\underset{\text{Condensation}}{C}\quad\underset{\text{Boiling}}{D}$

C. $\underset{\text{Boiling}}{A}\quad\underset{\text{Melting}}{B}\quad\underset{\text{Freezing}}{C}\quad\underset{\text{Condensation}}{D}$

D. $\underset{\text{Melting}}{A}\quad\underset{\text{Condensation}}{B}\quad\underset{\text{Boiling}}{C}\quad\underset{\text{Freezing}}{D}$

Answer: A

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Test 1

1. Mention the differences between evaporation and boiling.

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2. An ice cube floats on water. What conclusion can you draw on the basis of this observation?

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3. Identify whether the following statements are true or false and rewrite the false statemetns.

(a) Vinegar disappears when added to water.

(b) Kerosene and petrol form a single layer on mixing.

(c) Ground glass is a transparent material.

(d) Nitrogen gas is soluble in water.

(e) A liquid can have one free surface

(f) Solids have moderate intermolecular forces of attraction.

(g) Condensation is affected by cooling.

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4. Write a suitable terms for the following description.

(a) The fragrance of incense stick spreads in the entire space enclosed.

(b) A gas in a larger cylinder can be transferred into a smaller cylinder.

(C) Naphthalene balls reduce in size on long standing.

(d) Ethyl alcohol on heating starts vaporizing at $78^{\circ} C$.

(e) Liquids and gase can spread to larger distances.

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5. Water is taken in a stainless steel contaienr and heated. Heating is stopped and a lid is placed on the container. What could be your observation?

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6. Identify whether the following sentences are true or false. Also rewrite the false sentences by making suitable corrections.

(a) The constituents of a compound can be separated by physical means.

(b) Boron is a metal

(c) Xenon is an inert gas.

(d) Atom is the smallest unit of a compound.

(e) Aluminium is the most abundant non-metal in the earth's crust.

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7. Write the suitable terms corresponding to the descriptons given below.

(a) The ability of a material to be beaten into thin foils.

(b) The tendency of a material to prodce loud ringing sound.

(c) The ability of silver to be drawn into thin wires.

(d) The nature of a substance where the distribution of the different kinds of molecules is not uniform.

(e) A substance in which the constituents can be separated by physical methods.

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8. Classify the following substances into element, compound and mixture.

(i) Brass

(ii) Distilled water

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9. Complete the given table.

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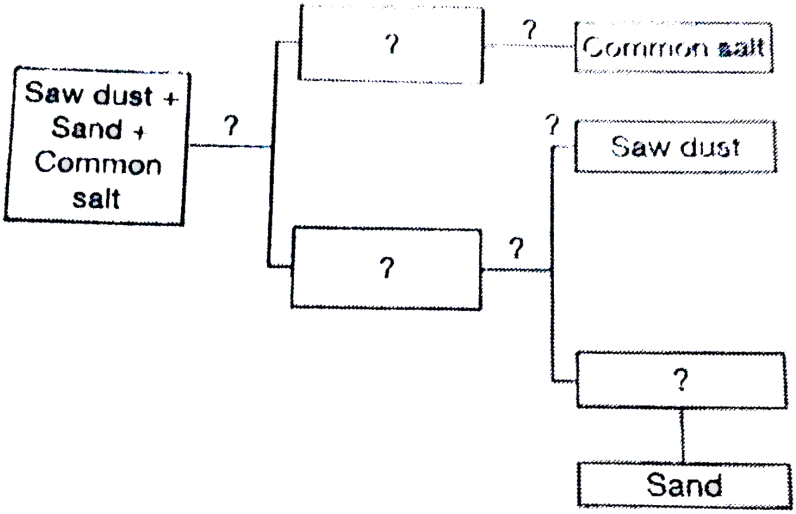
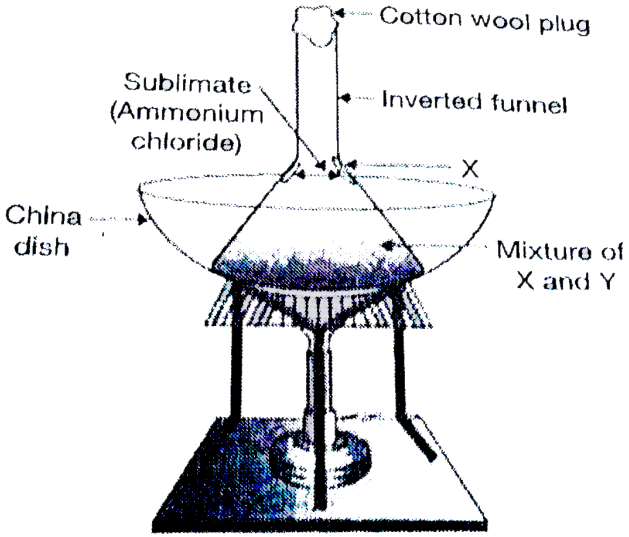
10. Observe the following flow chart and fill in the blanks with suitable process of separation and constituents of mixtures for the given reaction.





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11. (a) Which method of separation is indicated in the above figure?

(b) A mixture of two components X and Y X is an element and Y is a compound of two nonmetals. Identify X and Y.

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12. Is vapour and gas same? Why?

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13. A diver is able to cut through water in a swimming pool. Which property of matter does this observation show?

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14. Why ice floats on water?

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15. You are provided with a mixture of salt, sand, oil and water. Write the steps involved for the separation of salt, sand and oil from the mixture.

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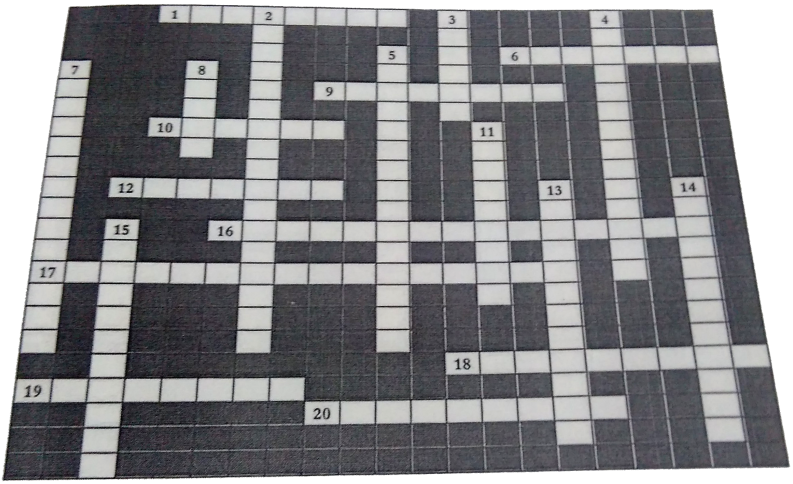

An example for metalloid

Heaviest element

Elements in definite proportion

An example for solid non-metal

Molecule made up of similar atoms

Kerosense and petrol

Sublimable substance

Property of a material to be drawn into thin wives

Conversion of liquid to solid

Material used for filtration

Groundnut oil and ac

Conversion of solid to

Rotation of mixture a

Property of gases

Separation of coloure

An example for inert

Properities of metals

conversion of gas into

Difference in boiling

Nature of gas in liqui

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