Separation of Substances

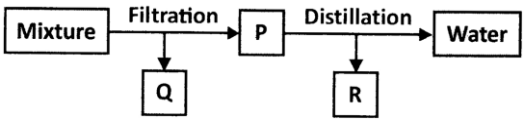
1. 'X' is a separation technique based on the difference in weights of the solids in a solid-solid mixture. What is X?
(a) Sieving (b) Handpicking
(c) Threshing (d) Winnowing

2. What type of a substance is steel?
(a) A solid - liquid heterogeneous mixture
(b) A solid - solid heterogeneous mixture
(c) A solid - solid homogeneous mixture
(d) A pure substance

3. Vinegar is a solution of acetic acid in water. What kind of mixture is vinegar?
(a) A homogeneous mixture of solid and liquid
(b) A heterogeneous mixture of liquid and liquid
(c) A homogeneous mixture of liquid and liquid
(d) A heterogeneous mixture of solid and liquid

4. Which of the following separation techniques is used for separating a mixture of two or more gases?
(a) Sedimentation (b) Liquification
(c) Hand picking (d) Decantation

(5-7): Questions 5-7 are based on the following flow chart which gives the techniques a student adopted to separate the constituents of a mixture.



5. What could the mixture be?
(a) Water + sand + glass
(b) Oxygen + hydrogen + salt
(c) Stones + rice + water
(d) Chalk powder + sugar + water

6. What could substance R be?
(a) Sugar (b) Chalk powder
(c) Glass (d) Oxygen

7. What is substance Q?
(a) Sugar (b) Chalk powder
(c) Alcohol (d) Oxygen

8. How are grain seeds removed from their stalks?
(a) Sieving (b) Winnowing
(c) Threshing (d) All of the above

9. A compound has
(a) only one kind of mixture.
(b) only one kind of element.
(c) a mixture of elements and molecules.
(d) only one kind of molecules.

10. A Identify the mixture from the following.
(a) Oxygen (b) Carbon dioxide
(c) Hydrogen (d) Air

11. Identify the compound from the following.
(a) Oxygen (b) Carbon dioxide
(c) Hydrogen (d) Air

12. Identify the element from the following.
(a) Oxygen (b) Carbon dioxide
(c) Water (d) Air

13. Which of the following is an example of a solid-in-gas mixture?
(a) Soil (b) Smoke
(c) Moisture (d) Dew

14. Which of the following does NOT belong to the group formed by the others?
(a) Brass (b) Water
(c) Butter-milk (d) Steel

15. A pure substance is made of
(a) Only one kind of atoms or molecules.
(b) Two or more kinds of molecules.
(c) Mixture of homogeneous substances
(d) all of the above

16. Which of the following statements about a mixture is TRUE?
(a) It is a pure substance.
(b) Its constituents are not combined chemically.
(c) Its constituents do not retain their individual properties.
(d) It is always homogeneous.

17. In a mixture, constituents exhibit
(a) Similar properties.
(b) Only those properties which are characteristic to the mixture.
(c) Their own properties.
(d) No properties.

18. What is the process by which a gas changes into a liquid?
(a) Decantation (b) Sublimation
(c) Condensation (d) Sedimentation

19. What kind of mixtures are alloys?
(a) Solid-Gas
(b) Liquid-Liquid
(c) Gas-Gas
(d) Solid-Solid

20. What kind of mixtures are aerated drinks?
(a) Solid-Solid
(b) Liquid-Solid
(c) Gas-Liquid
(d) Liquid-Liquid

21. Identify the liquid-in-gas type of mixture from the following.
(a) Dissolved carbon dioxide in water
(b) Droplets of water in air
(c) Dissolved oxygen in water
(d) All of the above

22. A homogeneous mixture
(a) Is made up of one type of molecules.
(b) Is the one in which the components can be distinguished.
(c) Is the one in which the components cannot be distinguished.
(d) Can be separated into its constituents physically.

23. A mixture contains three different substances X, Y and Z. They are of the same size, cubical in shape and yellow in colour. X particles are very heavy, insoluble, non-magnetic and contribute 50% of the mixture. Y particles are very light, insoluble, non-magnetic and contribute 40% of the mixture.
And Z particles are iron pieces. Which of the following methods can separate X, Y and Z?
(a) Winnowing, Magnetic separation
(b) Magnetic separation, Winnowing
(c) Sieving, Magnetic separation. Filtration
(d) Handpicking, Sublimation, Sieving

24. The sky looks clearer and brighter after the rain due to loading by rain drops.
Which of the following is similar to the process mentioned above?
(a) Separation of butter from curd.
(b) Separation of salt from sea water.
(c) Sprinkling water on a dusty street before sweeping.
(d) Separation of grain seeds from their stalks.

25. 'X' is a separation technique used only when the components of a solid-solid mixture have different sizes. Identify 'X'.
(a) Winnowing
(b) Sieving
(c) Threshing
(d) Magnetic separation

26. Given below are some methods of separation.

X Winnowing
Y-Threshing
Z- Sieving

Which of the following methods of separation does not require air for the process of separation?
(a) Only X
(b) Only Y,Z
(c) Only Z, X
(d) X, Y and Z

27. How is scrap-iron separated from other wastes in the scrap yard?
(a) Sublimation
(b) Magnetic separation
(c) Handpicking
(d) Winnowing

28. Match the entries in Column-I with those in Column-II

Column-I			Column-II
a.	A chalk water mixture	1.	A gaseous mixture
b.	A glucose solution	2.	A heterogeneous solid-liquid mixture
c.	Carbonated water	3.	A homogeneous solid-liquid mixture
d.	Air	4.	A gas-liquid mixture

(a) $a-2,\ b-3,\ c-4,\ d-1$
(b) $a-1,\ b-4,\ c-2,\ d-3$
(c) $a-2,\ b-4,\ c-3,\ d-1$
(d) $a-2,\ b-4,\ c-1,\ d-3$

29. fry Which of the following mixtures can be separated by using a filter paper?
(a) Vinegar
(b) Saltwater
(c) Sand and water
(d) Sugar water

30. Study the table given below.

Mixture	Wanted	Unwanted
1. Wheat flour	Flour	X
2. Y	Grain seeds	Stalks

Based on the above information, identify T and T.

	X	Y
(a)	Husk	Cut paddy
(b)	Wheat	Husk
(c)	Wheat	Sawdust
(d)	Husk	Sand

31. Which process is used to separate a pure solid from a solid-liquid solution?
(a) Simple distillation
(b) Crystallization
(c) Filtration
(d) Sedimentation and decantation

32. Given below are some physical properties.

(i) Physical state
(ii) Density
(iii) Size of constituents

Which of the following physical properties of the constituents are utilised in separating the components of a mixture?
(a) Only (i) and (ii)
(b) Only (ii) and (iii)
(c) Only (i) and (iii)
(d) (i), (ii) and (iii)

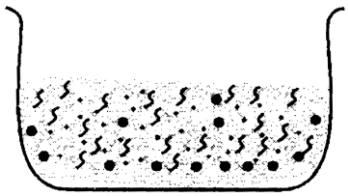
33. What happens when distilled water is evaporated?
(a) Some salt is left behind.
(b) Some sand is left behind.
(c) Some sugar is left behind.
(d) Nothing is left behind.

34. Which process is used for separating a mixture of water and sulphur?
(a) Filtration
(b) Winnowing
(c) Evaporation
(d) Distillation

35. Which of the following are involved in filtration technique?
(a) Hair in our nostrils
(b) Oil and air filters in cars
(c) Air filters in air conditioners
(d) All of the above

36. What process is used for separating heterogeneous mixtures of insoluble solid-in-liquid?
(a) Filtration
(b) Crystallization
(c) Sublimation
(d) Fractional distillation

37. Nisha poured a mixture of salt, iron filings, sand and flour into a container.



Which of the following substances can be separated from the mixture by using a magnet?
(a) Salt
(b) Flour
(c) Sand
(d) Iron filings

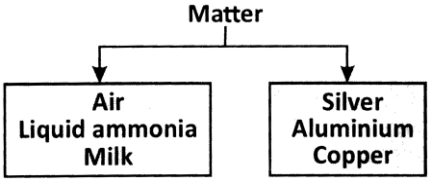
38. Study the information given below.

- Some substances are made up of two or more elements combined together chemically.
- Properties of these substances are different from the elements that make them.
- This substances cannot be broken down by physical methods.

Which of the following substances has the properties listed above?
(a) Iodine
(b) Calcium
(c) Air
(d) Sugar

39. Which process takes place in a washing machine while clothes are being dried.
(a) Magnetic separation
(b) Filtration
(c) Evaporation
(d) Centrifugation

40. The flow chart given below are examples of materials X and Y.



Identify X and Y.

X	Y
(a) Non metals	Metals
(b) Mixtures	Metals
(c) Compounds	Elements
(d) Compounds	Pure substances

41. Which of the following statements is NOT true?
(a) No more salt can be dissolved in a saturated solution of salt water. Without heating.
(b) Water dissolves different amounts of soluble substances in it.
(c) A mixture of milk and water can be separated by filtration.
(d) Salt is separated from sea water by evaporation.

42. By which method is wheat flour separated from wheat bran?
(a) Handpicking (b) Sieving
(c) Winnowing (d) Filtration

43. Which of the following is NOT a pure substance?
(a) Argon
(b) Helium
(c) Water
(d) Air

44. Why do we separate substances in a mixture?

(i) To separate two different but useful components.
(ii) To remove useless components.
(iii) To remove inipurities.

(a) Only (i) and (ii)
(b) Only (ii) and (iii)
(c) Only (i) and (iii)
(d) (i),(ii)and(iii)

45. A glass filled with ice cubes is kept on a table. After sometime water drops were observed sticking to the outside of the glass. Which of these sentences is TRUE of this phenomenon?

(i) This phenomenon is known as condensation.
(ii) This proves that water vapour is present in air.
(iii) This is also observed when a hot object is cooled in the open.

(a) Only (i) and (ii)
(b) Only (ii) and (iii)
(c) Only (i) and (iii)
(d) (i), (ii) and (iii)

Answers and Solution

1. (d) 'X' is winnowing, a process which uses the difference in weights of solids in a solid- solid mixture for separating the components.

2. (c) Steel is uniform in its composition. Hence, it is a homogeneous mixture of solids.

3. (c) Acetic acid and water are miscible liquids.

4. (b) Liquification involves condensation of gases. The gas which condenses first gets separated. In all the other options, atleast one of the constituents is a solid.

5. (d) It is a mixture of chalk powder, sugar and water. The chalk powder gets separated from sugar water by filtration. Later, sugar from sugar water is separated by distillation.

6. (a) R should be a substance which is soluble in water i.e., sugar.

7. (c) Q should be a substance that is solid and insoluble in water i.e., chalk powder.

8. (c) By threshing (i.e., beating the stalks on a slab) grain seeds are separated from their stalks.

9. (d) A compound is a pure substance containing only one kind of molecules.

10. (d) Air is mixture. The components of air are not chemically combined with one another.

11. (b) A compound is a substance which contains only one type of molecules i.e. CO_2 .

12. (a) An element is a substance which is made up of only one type of atoms. Oxygen (O_2) is diatomic in nature.

13. (c) Minute solid particles float along with vapours (fumes) in the smoke. Hence, smoke is a solid-in-gas mixture.

14. (b) Water is a pure substance and all others are solid-in-solid and solid-in-liquid mixtures.

15. (a) A substance is pure if its composition is constant throughout and is made up of only one type of particles i.e. atoms or molecules

16. (b) In a mixture, the constituent substances are mixed only physically but not combined chemically. A mixture is not a pure substance as its constituents retain their properties. So, a mixture can be either homogeneous or heterogeneous.

17. (c) The components of a mixture are not chemically bound. Therefore, they retain their individual properties.

18. (c) When a gas changes into a liquid, the process is known as condensation.

19. (d) A mixture of solid-in-solid is called an alloy.

20. (c) Aerated drinks are a mixture of carbon dioxide and water i.e. gas in liquid.

21. (b) Droplets of water in air form a liquid-in-gas type of mixture.

22. (c) A homogeneous mixture is the one in which the components cannot be distinguished because they are completely mixed together and are in one phase.

23. (a) Very light particles Y can be separated by winnowing, while 'T being magnetic in nature, can be separated by magnetic separation leaving behind X

24. (c) Water is sprinkled on a dusty street to help the dust particles settle down before sweeping. It then becomes easier for sweeping. Such a process is called loading or coagulation. It is a common experience that after rain, the sky looks clear and brighter. This is because the dust particles settle down due to loading by rain drops.

25. (b) Sieving is a separation technique used only when the components of a solid-solid mixture have different sizes.

26. (b) Only winnowing (X) needs air for the process of separation. While threshing (Y) and sieving (Z) do not need air while they are carried out.

27. (b) Iron has the tendency to get attracted by magnets. Hence, by using magnets, scrap iron can be separated from other wastes.

28. (a) A chalk water mixture is a heterogeneous solid-liquid mixture.
A glucose solution is a homogeneous solid- liquid mixture.
Carbonated water is a gas-liquid mixture.
Air is a gaseous mixture, a-2, b-3, c-4, d-1.

29. (c) A mixture of insoluble solid in liquid, i.e. sand and water can be separated by filtration.

30. (a) In wheat flour, flour is the wanted component while husk (X) is the unwanted component. When cut paddy (Y) stalks are beaten on a stone, the grain seeds separate from their stalks.

31. (a) Both solids and liquids in the pure form can be obtained by simple distillation.

32. (d) The difference in one or more of the following physical properties of the constituents is utilised to separate the components of a mixture, based on physical state, density, size of constituents, solubility, magnetic properties, diffusion, ability to sublime, volatility and melting and boiling points.

33. (d) As distilled water has no impurity, on evaporation nothing is left.

34. (a) Sulphur is a water insoluble solid. So, it is separated from water by filtration.

35. (d) In all the cases, dust is filtered out from the air by using filtration method.

36. (a) In heterogeneous mixtures the components can be differentiated. Hence, the solid particles are separated from liquid by using filtration method.

37. (d) In the given mixture, iron filings being magnetic are separated from non- magnetic substances.

38. (d) The three given properties are those of compounds. In the given options, sugar is a compound.

39. (d) Centrifugation is a method in which substances with particles of different weights are separated by rotating them in a machine at a high speed.

40. (b) Air, liquor ammonia and milk are mixtures while copper, aluminium and iron are metals which are pure substances.

41. (c) Milk is a colloidal solution. It cannot be separated by filtration.

42. (b) Both the components differ in the size of the particles. Seiving separates both wheat flour and bran.

43. (d) Air is a mixture whereas argon and helium are elements and water is a compound.

44. (d) We separate substances in a mixture to obtain useful components, remove useless components and impurities.

45. (a) Statements (i) and (ii) are true of the given phenomenon.