

Separation and Substances

IN TEXT QUESTIONS

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Q.1. How does one separate grain seeds from their stalks?

Ans. The process that is used to separate grain from stalks is threshing. In this process, the stalks are beaten to free the grain seeds. Sometimes, threshing is done with the help of bullocks. Machines are also used to thresh large quantities of grain.

Q.2. What happens when sand and powdered leaves are being fallen at the same place?

Ans. Since, sand is heavier while powdered leaves are lighter. When we fall these at the same place winds separate them, as sand are reached at that place vertically and leaves are blown away. This process is called as winnowing.

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Q.3. Which method of separating tea leaves from prepared tea is better, decantation or filtration?

Ans. Filtration is better than decantation to separate tea leaves from prepared tea.

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- Q.4. The best way to carry out the filtration of the mixture of water and sand is to use filter paper not cloth why?
- Ans. Since, cloths may have small holes but filter papers do not have any holes in fact, it has very fine pores in it, hence sand particles settle down on the filter paper while water after very neat pouring reached to vessel.

Q.5. From where salt comes?

Ans. Sea water contains many salts mixed in it. One of these salts is the common salt. When sea water is allowed to stand in shallow pits, water gets heated by sunlight and slowly turns into water vapour through evaporation. The water evaporates completely leaving behind the solid salt. Common salt is then obtained from this mixture of salts by further purification.

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- Q.6. What will happen if a high quantity of substances forced to dissolve in the fixed amount of water?
- Ans. After a certain amount of water, substances tend to undissolved in the vessel.



EXERCISES

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Q.1. Why do we need to separate different components of a mixture? Give two examples.

- Ans. A mixture is a material made by mixing two or more substances, which can be easily separated. We need to separate different components of a mixture for the following reasons:
 - (i) To separate two different but useful components.
 - (ii) To remove non-useful components.
 - (iii) To remove impurities or harmful components.
 - Two examples are as follows:
 - (i) Separation of stones from rice. Here, stones are non-useful component.
 - (ii) Churning milk to obtain butter. Here, both components are useful.

Q.2. What is winnowing? Where is it used?

Ans. Winnowing is used to separate heavier and lighter components of a mixture by wind or by blowing air. e.g. Wheat grains and husk are different in weight, husk being lighter than wheat.
When this mixture is allowed to fall down from a height, the wind carries the lighter husk with it and the heavy grains fall vertically down on the ground. This process is used by farmers to separate lighter husk particles from grain.

Q.3. How will you separate husk or dirt particles from a given sample of pulses before cooking?

Ans. We can separate husk or dirt particles from a given sample of pulses by winnowing. Being lighter, husk particles will fly away from pulses. We can also separate these by handpicking method.

Q.4. What is sieving? Where is it used?

Ans. Sieving is a method by which fine particles are separated from bigger particles by using a sieve. It is used in a flour mill, our homes and at construction sites.

In a flour mill, impurities like husk and stones are removed from wheat before grinding. At construction sites, pebbles and stones are removed from sand by sieving.

Q.5. How will you separate sand and water from their mixture?

Ans. We will separate sand and water from their mixture by the process of sedimentation and decantation.
Sedimentation During sedimentation, we leave mixture for some time, after that the sand which is heavier is settled down at the bottom.

Decantation After the above process, water is poured into another vessel and sand is left in first vessel. Thus, sand and water will be separated from their mixture.



Q.6. Is it possible to separate sugar mixed with wheat flour? If yes, how will you do it?

Ans. Yes, it is possible to separate sugar mixed with wheat flour by sieving. Size of sugar particles is more than that of the wheat flour. So, sugar will stay on sieve and wheat flour will pass through the holes of the sieve.

Q.7. How would you obtain clear water from a sample of muddy water?

Ans. We will obtain clear water from a sample of muddy water by the process of filtration.

In this process, we use a piece of cloth for filtering muddy water. Because in a piece of cloth, small holes or pores remain in between the wooven threads. These pores in a cloth can be used as a filter. If the water is still muddy, impurities can be separated by a filter that has even smaller pores. A filter paper is one such filter that has very fine pores in it. A filter paper folded in the form of a cone is fixed onto a funnel. The mixture is then poured on the filter paper. Solid particles in the mixture do not pass through it and remain on the filter and finally the clear water is obtained.

Q.8. Fill up the blanks:

(a) The method of separating seeds of paddy from its stalks is called

(c) Salt is obtained from sea water by the process of.....

- Ans. (a) The method of separating seeds of paddy from its stalks is called **threshing**.
 - (b) When milk, cooled after boiling, is poured onto a piece of cloth the cream (malai) is left behind on it. This process of separating cream from milk is an example of **filtration**.
 - (c) Salt is obtained from sea water by the process of evaporation.

(d) Impurities settled at the bottom when muddy water was kept overnight in a bucket. The clear water was then poured off from the top. The process of separation used in this example is called **sedimentation** and **decantation**.

Q.9. True or False?

- (a) A mixture of milk and water can be separated by filtration.
- (b) A mixture of powdered salt and sugar can be separated by the process of winnowing.
- (c) Separation of sugar from tea can be done by filtration.
- (d) Grain and husk can be separated with the process of decantation.
- Ans. (a) False, we cannot separate mixture of milk and water by filtration because milk is completely soluble in water.

(b) False, winnowing process is used to separate heavier and lighter components of a mixture, e.g. separation of husks from grains.

(c) False, sugar cannot be separated from tea by filtration because sugar is completely soluble in tea.

(d) False, grain and husk can be separated by the process of winnowing.

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Q.10. Lemonade is prepared by mixing lemon juice and sugar in water. You wish to add ice to cool it. Should you add ice to the lemonade before or after dissolving sugar? In which case would it be possible to dissolve more sugar?

Ans. We should add ice to lemonade after dissolving sugar. Without ice, sugar dissolves easily in lemon juice because solubility depends on the temperature. When the temperature is high, then more sugar can be dissolved. After mixing ice, it gets cool and less sugar

When the temperature is high, then more sugar can be dissolved. After mixing ice, it gets cool and less sugar will dissolve in it.



MULTIPLE CHOICE QUESTIONS

Q 1.	Paheli bought some vegetables such as French beans, lady's finger, green chillies, brinjals and potatoes all mixed in a bag. Which of the following methods of separation would be most appropriate for her to separate them?			
	(a) Winnowing	(b) Sieving		
	(c) Threshing	(d) Handnicking		
Ans	(d) Handnicking Pabeli can eas	ily senarate the vegetables by bandnicking method		
Alls.	(d) handpicking, ranen can easily separate the vegetables by handpicking method.			
Q 2.	Boojho's grandmother is suffering from diabetes. Hear doctor advised her to take 'Lassi' with less fa content. Which of the following methods would be most appropriate for Boojho to prepare it?			
	(a) Filtration	(b) Decantation		
	(c) Churning	(d) Winnowing		
Ans.	(c) Churning is a centrifugation using centrifuge machine.	method. The method of separation involving high speed is called churning		
03.	Which of the following mixtures would you be able to separate using the method of filtration?			
	(a) Oil in water	(b) Cornflakes in milk		
	(c) Salt in water	(d) Sugar in milk		
Anc	(b) Cornflakes in milk			
Alls.	(b) connakes in mik			
Q 4.	Which amongst the following methods would be most appropriate to separate grains from bundles o stalks?			
	(a) Handpicking	(b) Winnowing		
	(c) Sieving	(d) Threshing		
Ans.	(d) Threshing is mainly used to	separate grains from other parts, by beating stalks to free the grain.		
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Q 5.	Four mixtures are given below			
	(i) Kidney beans and chick peas	S		
	(ii) Pulses and rice			
	(iii) Rice flakes and corn			
(iv) Potato wafers and biscuits				
	Which of these can be separated by the method of winnowing?			
	(a) (i) and (ii)	(b) (ii) and (hi)		
	(c) (i) and (iii)	(d) (iii) and (iv)		
Ans.	(d) Rice flakes and corn or pota	to wafers and biscuits can be separated by the method of winnowing.		
0.0	White meaning shows the Date	all formed along the floor and her considered with a data back and the Mathematical Society of the second		
Q 6.	while preparing chapatis, Pan	en round that the flour to be used was mixed with wheat grains. Which out		
	of the following is the most su	Itable method to separate the grains from the flour?		

- (a) Threshing (b) Sieving
- (c) Winnowing (d) Filtration

- Ans. (b) The most suitable method to separate the impurities of smaller size like grains from the flour is sieving.
- Q 7. You might have observed the preparation of ghee from liter and cream at home. Which method(s) can be used to separate ghee from the residue? (i) Evaporation (ii) Decantation (iii) Filtration (iv) Churning Which of the following combinations is the correct answer? (a) (i) and (ii) (b) (ii) and (iii) (d) Only (iv) (c) (ii) and (iv)
- Ans. (b) Decantation and filtration
- Q 8. In an activity, a teacher dissolved a small amount of solid copper sulphate in a tumbler half-filled with water. Which method would you use to get back solid copper sulphate from the solution? (b) Evaporation (a) Decantation (c) Sedimentation (d) Condensation
- (b) We can get solid copper sulphate from the solution by evaporation of water. Ans.
- Q 9. During summer, Boojho carries water in a transparent plastic bottle to his school. One day, he left his bottle in the school. The bottle still had some water left in it. The following day, he observed some water droplets on the inner surface of the empty portion of the bottle. These droplets of water were formed due to
 - (a) boiling and condensation
 - (b) evaporation and saturation
 - (c) evaporation and condensation
 - (d) condensation and saturation
- (c) The droplets of water were formed due to evaporation and condensation. Ans.
- Q 10. Paheli asked for a glass of water from Boojho. He gave her a glass of ice cold water. Paheli observed some water droplets on the outer surface of the glass and asked Boojho, how these droplets of water were formed? Which of the following should be Boojho's answer?
 - (a) Evaporation of water from the glass
 - (b) Water that seeped out from the glass
 - (c) Evaporation of atmospheric water vapour
 - (d) Condensation of atmospheric water vapour
- (d) Water droplets on the outer surface of the glass is formed because of condensation of atmospheric water Ans. vapour.

VERY SHORT ANSWER TYPE QUESTIONS

- Sheela, Saima and Ravi have to dissolve maximum amount of sugar in the same amount of milk, so as to Q 11. win in a game. Ravi took hot boiling milk, while Saima took ice cold milk. Sheela managed to get milk at room temperature. Whom do you think would win the game and why?
- Ans. Milk at higher temperature would dissolve more amount of sugar and solubility increase with temperature. So, Ravi would win the game
- Q 12. State whether the following statements are true or false. (a) A mixture of oil and water can be separated by filtration (b) Water can be separated from salt by evaporation.

- (c) A mixture of wheat grains and wheat flour can be separated by sieving.
- (d) A mixture of iron filings and rice flour can be separated by magnet.
- (e) A mixture of wheat grains and rice flakes can be separated by winnowing.

(f) A mixture of tea leaves and milk can be separated by decantation.

Ans. (a) False, a mixture of oil and water can be separated by decantation

(b)True	(c) True
(d)True	(e) True

(f) True

SHORT ANSWER TYPE QUESTIONS

- Q 13. Name and describe briefly a method, which can be helpful in separating a mixture of husk from grains. What is the principle of this method?
- Ans. Winnowing is used to separate grains from impurities like husk by dropping it vertically from a height. All light impurities are separated by a blowing air or wind and hence husk from grains are separated easily

Q 14. Match the mixtures in Column I with their method of separation in Column II.

	Column I	Column II
(a)	Oil mixed in water	(i) Sieving
(b)	Iron powder mixed with	(ii) Handpicking
	flour	
(c)	Salt mixed with water	(iii) Decantation
(d)	Lady's finger mixed with	(iv) Magnet
	French beans	
(e)	Rice flour mixed with	(v) Evaporation
	kidney beans	

Ans.

Column I	Column II
(a) Oil mixed in water	(iii) Decantation
(b) Iron powder mixed with flour	(IV) Magnet
(c) Salt mixed with water	(V) Evaporation
(d) Lady's finger mixed with French	(ii) Handpicking
beans	
(e) Rice flour mixed with kidney	(i) Sieving
beans	

LONG ANSWER TYPE QUESTIONS

Q 15. Both Sarika and Mohan were asked to make salt Solution. Sarika was given a teaspoons full of salt and half a glass of water whereas Mohan was given twenty teaspoons full of salt and half a glass of water.(a) How would they make salt solutions?

(b) Who would be able to prepare saturated solution?

Ans. (a) They will mix salt with water within a certain amount to make salt solution. Hence, Sarika will make a better salt solution.

(b) Saturation is the point at which a solution of a substance can dissolve no more of that substance and additional amount of that substance will appear as a precipitate.

Mohan's solution would be saturated because in Mohan's case, some salt would remain undissolved and settled at the bottom of the glass.

Q 16. Paheli was feeling thirsty but there was only a pot of water at home which was muddy and unfit for drinking. How do you think Paheli would have made this water fit for drinking if the following materials were available to her.

Alum, tub, muslin cloth, gas stove, thread, pan and lid.

Ans. Paheli can make this water fit for drinking by work on following sequence:

Filtration using muslin cloth (cotton fabric).

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Swirl with alum and leave water undisturbed for some time.

Decantation The clear liquid above the impurities is poured in another container.

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Boil for 10 minutes in covered pan with lid.

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Cool, filter and now it is fit for drinking.

Q 17. Read the story titled 'Wise Farmer' and tick the correct option to complete the story.

A farmer was sad/happy to see his healthy wheat crop ready for harvest. He harvested the crops and left it under the sun/rain to dry the stalks. To separate the seeds from the bundles of the stalk, he handpicked/threshed them after gathering the seed grains, he wanted to separate the stones and husk from it. His wife winnowed/threshed them to separate the husk and later sieved/ handpicked to remove stones from it. She ground the wheat grains and sieved/filtered the flour. The wise farmer and his wife got a good price for the flour. Can you tell why?

Ans.	(i) happy	(ii) sun
	(iii) threshed	(iv) winnowed
	(v) hand picked	(vi) sieved
	They got a good price	as they used and

They got a good price, as they used appropriate methods of separations to get good quality of flour (Atta).

- Q 18. 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 by giving an activity along with the diagram.
- Ans. Steps for the separation of salt, sand and oil from the mixture are given below:
 - (a)



(b)

(a) **Decantation** The clear liquid above the impurities is poured in another container. So, decantation is used to separate oil.

(b) **Filtration** It is used for separating different substances, usually solids mixed with liquids with filter paper, funnel and container. So, filtration is used to separate sand.

(c) **Evaporation** The process of changing water into water vapour is called evaporation. So, evaporation is used to separate salt.