Multiple Choice Questions

Q1. Which of the following techniques would you use to separate sand from water?

    a. Evaporation

    b. Sieving

    c. Decantation

    d. Crystallisation

Q2. What is the purpose of filtration?

    a. To attract metallic objects

    b. To separate insoluble substances (things that don't dissolve) from a liquid

    c. To remove salt from water

    d. To make a solution

Q3. Which technique is commonly used to separate salt from water?

    a. Sieving

    b. Magnetic separation

    c. Evaporation

    d. Decantation

Q4. What would you use to separate iron filings from a mixture of iron and wood?

    a. Filtration

    b. Magnetic Separation

    c. Decantation

    d. Sieving

Q5. Which method is used to separate coffee grounds from liquid coffee?

    a. Evaporation

    b. Sieving

    c. Decantation

    d. Filtration

Q6. In which technique do we allow the solid to settle at the bottom and then pour off the liquid?

    a. Sieving

    b. Filtration

    c. Decantation

    d. Crystallisation

Q7. How does evaporation work?

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Q8. You have a mixture of iron filings, sand, and salt. In the space below, draw a flowchart showing how you would separate this mixture into its components.

Q9. How would you separate a mixture of oil and water? Describe the process.

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Q10. Label the following as either a mixture or a pure substance: saltwater, gold, air, salad, carbon dioxide, sand, iron filings.

Pure Substances	Mixtures

Q11. Compare decantation and filtration. What are the advantages and disadvantages of each?

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Q12. You are given a mixture containing coffee grounds, steel scraps, seawater, and lemon seeds. Your task is to separate this mixture into its individual components. Note that lemon seeds and coffee grounds do not dissolve in water.

a) Complete the table below, identifying each component and a physical property you could use to remove that component from the mixture.

Component	Physical Property

b) What separation technique will you use first, what will be removed because of this technique, and what physical property are you exploiting to make the separation?

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c) What will be your second separation technique, what will be removed because of this technique, and what physical property are you exploiting this time?

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d) What will be your third separation technique, what will be removed because of this technique, and what physical property are you exploiting for this final separation?

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e) What will be your fourth separation technique, what will be removed because of this technique, and what physical property are you exploiting for this final separation?

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Answers

1. Sieving
2. To separate insoluble substances (things that don't dissolve) from a liquid
3. Evaporation
4. Magnetic Separation
5. Filtration
6. Decantation
7. Evaporation works by heating a liquid, causing the liquid to turn into vapour and leaving behind the solid residue.

8.

> Use magnetic separation to remove iron filings.
> Add water to dissolve the salt.
> Filter the solution to separate sand.
> Evaporate the water to obtain salt.

9. To separate a mixture of oil and water, allow the mixture to settle. Since oil is less dense than water, it will float on the surface. You can then use decantation pour the oil from the top or distillation to boil off the water.

10. Pure Substances and Mixtures:

Pure Substances	Mixtures
gold	saltwater
carbon dioxide	air
	salad
	sand
	iron filings

11. Decantation and filtration both involve separating a solid from a liquid. Decantation lets the solid settle and then the liquid is poured off. Filtration uses a filter to separate the solid from the liquid. Decantation is quicker but may not remove all the solid, whereas filtration is more thorough but may be slower. Decantation can be used for two liquids.

12. Component and Physical Property:

Component	Physical Property
coffee grounds	does not dissolve in water
steel scraps	magnetic attraction
seawater	salt and water have different boiling points
lemon seeds	size and does not dissolve in water

The first separation technique I would use is magnetic separation to remove the steel scraps. The physical property exploited is the magnetic attraction of the steel scraps.

The second separation technique I would use is sieving or handpicking to remove the lemon seeds. The physical property exploited is the size of the seeds.

The third separation technique I would use is filtration to separate the coffee grounds from the seawater. The physical property exploited is the insolubility of the coffee grounds in water.

The fourth and final separation technique I would use is evaporation to obtain salt from the seawater. The physical property exploited is the difference in boiling points between salt and water; when the water evaporates, the salt remains as a solid residue.