1. Short answer questions:

i. What is the mass of the solution when 20 g of salt is dissolved in a 100 g of water?

The mass of the solution is still 120 grams. When a solute dissolves in a solvent, the masses of the solute and solvent combine to give the mass of the solution.

ii. Define a solution and give two examples.

A solution is a homogeneous mixture of two or more substances, where one substance (the solute) is dissolved in another (the solvent).

Examples:

- Salt dissolved in water
- Sugar dissolved in tea

iii. When salt is dissolved in water, which is the solute and which is the solvent?

In the solution of salt in water, salt is the solute, and water is the solvent.

iv. Give another name for a weak solution.

Another name for a weak solution is a "dilute solution."

v. Define a saturated solution.

A saturated solution is a solution in which the maximum amount of solute has been dissolved in the solvent at a given temperature and pressure, resulting in no further dissolution.

vi. What is the most plentiful liquid solution on Earth?

The most plentiful liquid solution on Earth is water.

vii. Name one common solvent other than water.

One common solvent other than water is ethanol (ethyl alcohol).

viii. What is meant by the solubility of a substance?

The solubility of a substance refers to the maximum amount of a substance that can dissolve in a particular solvent under specific conditions, usually expressed in terms of grams of solute per 100 grams of solvent.

2. Long answer questions:

i. A soft drink is described as a solution. Why?

A soft drink is described as a solution because it is a homogeneous mixture where various substances, such as sweeteners, flavorings, and carbon dioxide, are dissolved uniformly in a liquid solvent, typically water.

ii. How could you make a concentrated solution weaker?

To make a concentrated solution weaker, you can add more solvent (such as water) to the solution. This process, called dilution, reduces the concentration of the solute in the solution.

iii. What effect does warming have on saturated solution?

Warming a saturated solution typically increases its solubility. As the temperature rises, more solute can dissolve in the solvent, leading to an increase in the maximum amount of solute that the solution can hold.

iv. What is the effect of temperature on the amount of gas that will dissolve in a liquid?

In general, the solubility of gases in liquids decreases as temperature increases. This is because as the temperature rises, the kinetic energy of the gas molecules also increases, making them more likely to escape from the liquid. Conversely, lowering the temperature typically increases the solubility of gases in liquids.

v. **If you were given a solution in a test tube, how would you use one or two crystals of the solute to find out whether the solution was unsaturated, saturated, or supersaturated?**

By adding one or two crystals of the solute to the solution in a test tube:

- If the crystals dissolve, the solution is unsaturated.
- If the crystals remain undissolved, the solution is saturated.
- If the crystals cause more solute to dissolve, the solution is supersaturated.

vi. **What effect does temperature have on the solubility of the substance?**

For most solid solutes in liquid solvents, solubility generally increases with temperature, while for gases in liquid solvents, solubility tends to decrease with temperature.

vii. **Write uses of solutions.**

- **Medicine:** Solutions are used for easy administration of medications.
- **Cleaning**: Solutions dissolve and remove dirt and stains.
- **Food Preparation**: Solutions mix and dissolve ingredients in cooking.
- **Chemical Reactions:** Solutions serve as mediums for various chemical processes.
- **Hydration:** Beverages like sports drinks provide hydration solutions.
- **Printing and Ink:** Ink solutions are used for printing.
- **Photography:** Solutions are used in developing films and prints.

viii. What is the difference between a solution and suspension? Give three examples of each.

Solution	Suspension
A solution is a homogeneous mixture where solute particles are uniformly distributed in the solvent.	A suspension is a heterogeneous mixture with larger particles that may settle over time.
It usually appears clear and does not settle over time.	It appears cloudy or opaque, and constant agitation may be required to keep the particles dispersed.
Examples	**Examples**
• Saltwater • Sugar dissolved in tea • Air	• Orange juice with pulp • Italian salad dressing (oil and vinegar) • Muddy water

3. Fill ups

i. Aziz added sugar to his tea until no more would dissolve he made a **saturated** solution

ii. Sugar will dissolve in water because it is **soluble**.

iii. Flour will not dissolve in water because it is **insoluble.**

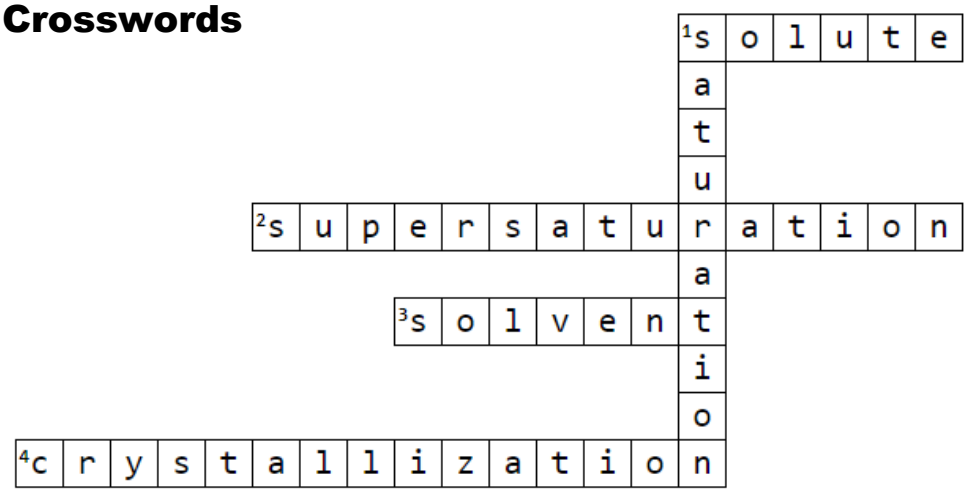
iv. To produce sugar from a sugar solution you need to allow the water to **evaporate.**

v. The solubility increases with increasing **temperature.**

4. Tick the right option.

1. A solution is made by:			
I. Filtration	II. Evaporating	III. Heating it until it melts	**IV. Adding a solute to a solvent**
2. What type of solution has small amount of solute?			
I. Saturated	**II. Dilute**	III. Concentrated	IV. supersaturated
3. Which one of the following substances is insoluble in water?			
I. Table salt	**II. Oil**	III. Sugar	IV. Washing soda
4. The solubility of a solid in a liquid is the amount of solid which can be dissolved in			
I. 100 g of liquid	II. 75 g of liquid	III. 50 g of liquid	IV. 25 g of liquid
5. Which of the following is an example of suspension			
I. Salt water	**II. Muddy water**	III. Sugar	IV. Air

4. Crosswords



Across	Down
1. The substance being dissolved in a solution	**5.** The maximum amount of solute that can dissolve in a solvent at a specific temperature
2. A solution that contains more solute than it would normally dissolve at a specific temperature	
3. A liquid that dissolves a solute to form a solution	
4. The process of turning a solution into a solid by removing the solvent	

6. Words Search

Find the following word in the words search.

Soluble	Precipitate	Dilute	Dissolve	Mixture

S	C	P	T	S	A	L	T	C
D	Y	R	G	E	S	E	V	A
I	T	E	H	A	O	B	E	R
S	O	C	U	R	L	E	N	R
S	P	P	K	H	U	A	T	D
O	M	I	X	T	B	R	E	I
L	A	T	V	E	L	I	I	A
V	S	A	I	N	E	L	C	C
E	M	T	T	U	E	M	L	T
G	U	E	D	I	L	U	T	E

7. Jumbled Words

Jumbled words	Arranged words
Sionpensus	Suspension
rationpoeva	Evaporation
Genousmoho	Homogeneous
Genoushetero	Heterogeneous
Tilfration	Filtration

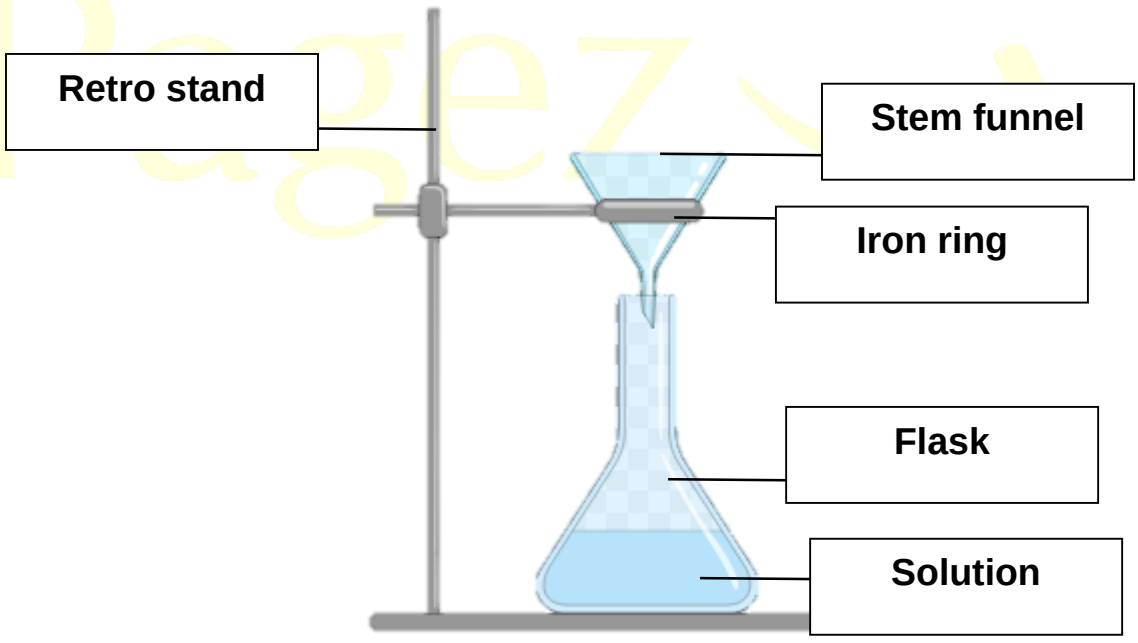
8. Columns

A	B
Filtration	Mixture with uniform composition
Solubility	Solid that forms when a solution becomes too concentrated
Homogenous	Separation technique based on particle size
Heterogeneous	The ability of a substance to dissolve in a solvent
Precipitate	Mixture with uneven distribution of components

9. Write "T" for the true and "F" for the false statement.

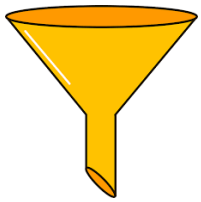
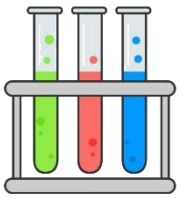
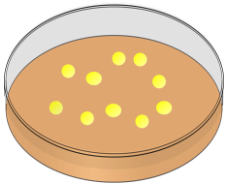
i.	A solution is a homogeneous mixture of two or more substances with variable composition.	T
ii.	Saturation refers to the maximum amount of solute that can dissolve in a solvent at a specific temperature.	T
iii.	Filtration is a technique used to separate components of a solution based on their particle size.	F
iv.	A supersaturated solution contains less solute than it would normally dissolve at a specific temperature.	F
v.	Adding more solvent to a solution decreases its concentration.	T

11. Label the diagram.



10. Drag and Drop

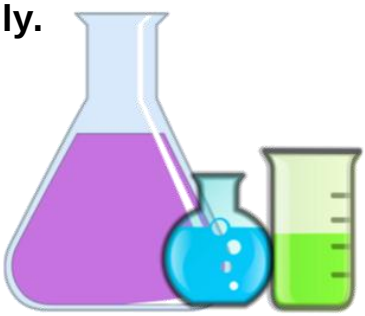
Look at the pictures and write their names in the relevant column.

				
Funnel	**Test tube**	**Petri dish**	**Burette**	**Bunsen Burner**

Apparatus	Function
Funnel	transfer liquids from one container to another
Test tube	used for holding or heating small amounts of liquid
Petri dish	used for cultivating and observing microorganisms
Burette	Used to measure volume of liquid
Bunsen Burner	Source of heat for experiments.

11. Comprehension

Answer the following questions after reading the paragraph and observe the picture carefully.



Solutions are homogeneous mixtures formed when a solute dissolves in a solvent, creating a uniform blend at the molecular level. Saturation is reached when the solvent can no longer dissolve more solute, resulting in a stable mixture. Dilution, on the other hand, involves adding more solvent to decrease the concentration of the solution. Scientists use various techniques like filtration to separate solid particles, evaporation to concentrate solutions by removing the solvent, and crystallization to form solid crystals. The behavior of solutions is influenced by factors such as temperature, pressure, and the nature of the solute and solvent.

I. **What are solutions?**

Solutions are homogeneous mixtures formed when a solute dissolves in a solvent.

I. **Which techniques are used by scientists?**

Scientists use various techniques like filtration to separate solid particles, evaporation to concentrate solutions by removing the solvent, and crystallization to form solid crystals.

II. **What are the factors by which behavior of a solution is influenced?**

The behavior of solutions is influenced by factors such as temperature, pressure, and the nature of the solute and solvent.