UNIQUE STUDY POINT

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Class: VI	**Subject:** Science	**Session:** 2025-26
Chapter: 08 - A Journey through States of Water	**Time:** 1½ Hours	**Max. Marks:** 40

General Instructions:

1. All questions are compulsory.
2. This question paper contains 20 questions divided into five sections A, B, C, D and E.
3. Section A contains 10 MCQs of 1 mark each.
4. Section B contains 4 questions of 2 marks each.
5. Section C contains 3 questions of 3 marks each.
6. Section D contains 1 question of 5 marks.
7. Section E contains 2 Case Study Based questions of 4 marks each.

SECTION A - Multiple Choice Questions (1 mark each)

1. The process of conversion of solid state into liquid state is called:
(a) Evaporation
(b) Condensation
(c) Melting
(d) Freezing

2. Which property is shown by water vapour?
(a) It has a fixed shape
(b) It takes the shape of container
(c) It spreads in all available space
(d) It cannot flow

3. Steam is:
(a) Pure water vapour
(b) Water vapour mixed with tiny water droplets
(c) Liquid water
(d) Frozen water

4. Which of the following will evaporate fastest?
(a) Water in a narrow bottle
(b) Water spread on a plate
(c) Water in a covered container
(d) Water in a bucket

5. Clouds are formed due to:

(a) Evaporation only
(b) Condensation of water vapour around dust particles
(c) Freezing of water
(d) Melting of ice

6. On which day will clothes dry fastest?
(a) Cold and humid day
(b) Hot and humid day
(c) Cold and windy day
(d) Hot and windy day

7. Water vapour is:
(a) Visible to us
(b) Invisible to us
(c) Sometimes visible, sometimes invisible
(d) Visible only at night

8. The conversion of liquid state into solid state is called:
(a) Melting
(b) Freezing
(c) Evaporation
(d) Condensation

9. Why does water vapour rise up in the atmosphere?
(a) It is heavier than air
(b) It is lighter than air
(c) It has the same density as air
(d) Due to wind only

10. When we boil water in a covered utensil, water droplets appear on the inner side of the lid due to:
(a) Evaporation
(b) Melting
(c) Condensation
(d) Freezing

SECTION B - Short Answer Questions (2 marks each)

11. State two differences between the properties of ice and water.

12. Why is it difficult to hold ice in our hands for a long time, but water can be held in a container easily?

13. Explain why wet floors dry up after some time even without wiping.

14. What happens when water is heated continuously? Name the processes involved.

SECTION C - Short Answer Questions (3 marks each)

15. Explain with examples how temperature affects the rate of evaporation of water.

16. Why do we feel cool when we perspire (sweat) and sit under a fan?

17. Compare the properties of water in its three different states - solid, liquid, and gas. (Present your answer in tabular form)

SECTION D - Long Answer Question (5 marks)

18. (a) Describe an experiment to show that water does not seep through a glass tumbler and that the water droplets appearing on the outer surface are due to condensation. (3 marks)
(b) Why is it important to conserve water? (2 marks)

SECTION E - Case Study Based Questions (4 marks each)

19. Case Study 1: Formation of Clouds and Rain

The sun's heat causes water from oceans, rivers, and lakes to evaporate. This water vapour rises up in the atmosphere. As it goes higher, the air becomes cooler. When the water vapour comes in contact with cool air, it condenses around tiny dust particles present in the atmosphere. This forms tiny water droplets that float in the air and appear as clouds.

When many tiny droplets join together, they become heavier. Eventually, these heavy drops fall down as rain. Sometimes, if the temperature is very low, the water droplets freeze and fall as snow or hail.

Answer the following questions:
(a) What causes water to evaporate from water bodies? (1 mark)
(b) Why does water vapour condense at higher altitudes? (1 mark)
(c) Explain the role of dust particles in cloud formation. (1 mark)
(d) Why do tiny water droplets in clouds eventually fall as rain? (1 mark)

20. Case Study 2: Desert Coolers vs. Air Conditioners

In many parts of India, people use desert coolers (also called evaporative coolers) during summer. These coolers work by passing hot air through wet pads. As the water in the pads evaporates, it absorbs heat from the air, cooling it down. The cool air is then blown into the room by a fan.

However, desert coolers don't work well in coastal areas where humidity is very high. In such places, people prefer air conditioners which work on a different principle and are not affected by humidity.

Answer the following questions:
(a) What principle do desert coolers work on? (1 mark)
(b) Why do desert coolers not work efficiently in areas with high humidity? (2 marks)
(c) Why do you think desert coolers are more commonly used in hot and dry regions? (1 mark)

DETAILED ANSWER KEY - PAPER 02

SECTION A - Answers to MCQs

1. (c) Melting
Melting is the process of conversion of a solid into liquid state. For example, ice melts to form water.

2. (c) It spreads in all available space
Water vapour is in gaseous state and has the property of spreading in all available space.

3. (b) Water vapour mixed with tiny water droplets
Steam is water vapour containing tiny water droplets, which makes it visible.

4. (b) Water spread on a plate
Water spread on a plate has the largest exposed surface area, so it will evaporate fastest.

5. (b) Condensation of water vapour around dust particles
Clouds are formed when water vapour condenses around dust particles to form tiny droplets.

6. (d) Hot and windy day
Hot temperature and wind both increase the rate of evaporation, making clothes dry fastest.

7. (b) Invisible to us
Water vapour is actually invisible. We can see steam because it contains tiny water droplets.

8. (b) Freezing
Freezing is the process of conversion of liquid into solid state.

9. (b) It is lighter than air
Water vapour is lighter than air, which causes it to rise up in the atmosphere.

10. (c) Condensation
Water vapour condenses on the cool inner surface of the lid to form water droplets.

SECTION B - Answers to Short Answer Questions

11.

Two differences between ice and water:

Shape:
• Ice has a fixed shape and maintains its shape irrespective of the container
• Water does not have a fixed shape and takes the shape of the container

Ability to Flow:
• Ice does not flow
• Water flows easily from one place to another

12.

Ice is difficult to hold for a long time because:
• Ice is in solid state and feels very cold to touch

• The extreme cold causes discomfort and can harm our skin if held for too long
• Water, being in liquid state, is at room temperature or warmer
• Water is comfortable to hold in a container and doesn't cause cold burns

13.

Wet floors dry up due to evaporation:
• Water on the floor surface is exposed to air
• Heat from the surroundings (room temperature) causes the water molecules to gain energy
• Water gets converted into water vapour and mixes with the air
• This process continues until all the water evaporates and the floor becomes dry

14.

When water is heated continuously:
• First, the water temperature increases
• At 100°C (boiling point), water starts boiling
• Water gets converted into steam (water vapour with tiny droplets)
• If heated further, all water will evaporate

Process involved: Evaporation (conversion of liquid water into water vapour)

SECTION C - Answers to Short Answer Questions

15.

Temperature has a significant effect on the rate of evaporation:

High Temperature:
• At higher temperatures, water molecules have more energy
• They can escape from the liquid surface more easily
• Rate of evaporation increases
• Example: Water kept in sunlight evaporates faster than water kept in shade

Low Temperature:
• At lower temperatures, water molecules have less energy
• They cannot escape easily from the liquid surface
• Rate of evaporation decreases
• Example: In winter, wet clothes take longer to dry compared to summer

16.

We feel cool when we perspire and sit under a fan because:

• When our body is hot, sweat glands produce perspiration (sweat) on our skin
• This sweat needs to evaporate to cool our body
• When a fan blows air, it increases air movement near our skin
• Increased air movement speeds up evaporation of sweat
• During evaporation, sweat takes heat from our body
• This removal of heat makes us feel cool
• Without a fan, evaporation would be slower and cooling effect would be less

17.

Comparison of Properties of Water in Three States:

Property	Solid (Ice)	Liquid (Water)	Gas (Water Vapour)
Shape	Fixed shape	No fixed shape, takes container's shape	No fixed shape, spreads everywhere
Volume	Fixed volume	Fixed volume	No fixed volume
Ability to Flow	Cannot flow	Can flow easily	Spreads in all directions
Visibility	Visible	Visible	Invisible
Compressibility	Not compressible	Not compressible	Highly compressible

SECTION D - Answer to Long Answer Question

18.

(a) Experiment to show condensation on glass tumbler: (3 marks)

Materials Required:
• Glass tumbler
• Ice cubes
• Water
• Small steel plate or lid
• Digital weighing balance
• Permanent marker or tape

Procedure:
1. Take a glass tumbler and half-fill it with water
2. Add a few ice cubes to the water
3. Mark the water level on the outside of the tumbler with a permanent marker
4. Cover the tumbler with a small steel plate
5. Place the covered tumbler on a digital weighing balance
6. Note the initial reading
7. Observe the tumbler after 15-20 minutes

Observations:
• Water droplets appear on the outer surface of the glass tumbler
• The water level inside the tumbler remains at the marked line (hasn't decreased)
• The reading on the weighing balance increases

Conclusion:
• Water is not seeping through the glass tumbler because the water level inside hasn't decreased
• The extra water on the outside comes from condensation of water vapour from the air
• Water vapour in the air condenses on the cold outer surface of the tumbler
• The increase in weight proves that water is being added from outside (air), not from inside the tumbler

(b) Importance of water conservation: (2 marks)

Water conservation is important because:

• Only a small portion of Earth's water is fit for human use (most is in oceans as salt water)
• Freshwater sources like rivers, lakes, and groundwater are limited
• The world population is increasing, leading to higher water demand
• Many parts of the world already face water scarcity
• Water is essential for drinking, agriculture, industry, and all life
• Once polluted, water is difficult and expensive to clean
• We must preserve water for future generations
• Conservation helps maintain the water cycle and ecosystem balance

SECTION E - Answers to Case Study Based Questions

19. Case Study 1 - Formation of Clouds and Rain

(a) The sun's heat (solar energy) causes water to evaporate from oceans, rivers, and lakes. The heat provides energy to water molecules, allowing them to escape from the liquid surface and convert into water vapour. (1 mark)

(b) Water vapour condenses at higher altitudes because as the water vapour rises, it reaches cooler regions of the atmosphere. The temperature decreases with altitude. When water vapour comes in contact with cool air, it loses heat energy and condenses into liquid water droplets. (1 mark)

(c) Dust particles play a crucial role in cloud formation. They act as nuclei (centers) around which water vapour can condense. The water vapour molecules condense around these dust particles to form tiny water droplets. Without dust particles, cloud formation would be difficult. (1 mark)

(d) Initially, tiny water droplets are very small and light, so they float in the air as clouds. However, as more water vapour condenses, many tiny droplets join together to form bigger drops. These bigger drops become heavy enough that they can no longer float in the air and fall down due to gravity as rain. (1 mark)

20. Case Study 2 - Desert Coolers vs. Air Conditioners

(a) Desert coolers work on the principle of evaporative cooling. They use the cooling effect of evaporation to reduce the temperature of air. (1 mark)

(b) Desert coolers do not work efficiently in areas with high humidity because:
• The air in humid areas already contains a large amount of water vapour
• When humidity is high, the air has little capacity to hold more water vapour
• This means evaporation of water from the wet pads becomes very slow
• Since evaporation is slow, less heat is absorbed from the air
• Therefore, the cooling effect is greatly reduced or almost negligible
• The cooler may actually add more moisture to the already humid air, making it uncomfortable (2 marks)

(c) Desert coolers are more commonly used in hot and dry regions because:
• In hot and dry areas, humidity is low
• Low humidity means air can hold more water vapour
• This allows rapid evaporation from the wet pads
• Rapid evaporation provides excellent cooling effect
• Desert coolers are also energy-efficient and less expensive than air conditioners, making them ideal for these regions (1 mark)