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. Which of the following shows the correct order of states of water from solid to gas?
(a) Water → Ice → Water vapour
(b) Ice → Water vapour → Water
(c) Ice → Water → Water vapour
(d) Water vapour → Water → Ice

2. In which container will water evaporate slowest?
(a) Open wide container
(b) Covered container
(c) Shallow plate
(d) Open narrow bottle

3. The boiling point of water is:
(a) 0°C
(b) 50°C
(c) 100°C
(d) 150°C

4. Clouds float in the air because:
(a) They are very light
(b) Tiny water droplets are very light and float in air
(c) Wind carries them
(d) They are made of ice

5. Which of the following is an example of condensation?

(a) Drying of clothes
(b) Melting of ice cream
(c) Formation of fog
(d) Boiling of water

6. Evaporation is a:
(a) Heating process
(b) Cooling process
(c) Neutral process
(d) Chemical change

7. When we sprinkle water on the roof on a hot summer day, we feel cooler because:
(a) Water is cold
(b) Evaporation causes cooling
(c) Water reflects sunlight
(d) Water absorbs heat

8. The freezing point of water is:
(a) 100°C
(b) 50°C
(c) 0°C
(d) -10°C

9. Which of the following will increase the rate of evaporation?
(a) Decrease in temperature
(b) Increase in humidity
(c) Increase in wind speed
(d) Covering the container

10. Water stored in a surahi (clay pot) becomes cool due to:
(a) Porous nature of clay allowing evaporation
(b) Clay is naturally cold
(c) Clay does not allow heat to pass
(d) Chemical reaction between clay and water

SECTION B - Short Answer Questions (2 marks each)

11. Why do we see water droplets on the outer surface of a glass containing ice-cold water?

12. Give two reasons why evaporation is considered a surface phenomenon.

13. Explain why people sprinkle water on village roads during summer.

14. Why does water spilled on the floor disappear after some time even if we don't wipe it?

SECTION C - Short Answer Questions (3 marks each)

15. Explain with an activity how you can demonstrate that evaporation causes cooling.

16. How does air movement affect the rate of evaporation? Explain with two examples from daily life.

17. What are the factors that affect the rate of evaporation? Explain any three factors in detail.

SECTION D - Long Answer Question (5 marks)

18. (a) Describe the processes of evaporation and condensation with suitable examples. (3 marks)
(b) How are these two processes important in the water cycle? (2 marks)

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

19. Case Study 1: Water Conservation in Agriculture

Drip irrigation is a modern method of irrigation where water is supplied directly to the roots of plants through a network of pipes and tubes. Unlike traditional flood irrigation where entire fields are flooded with water, drip irrigation releases water drop by drop at the base of each plant.

This method has several advantages. It reduces water wastage significantly as water goes directly to plant roots rather than evaporating from large water surfaces. It also reduces the growth of weeds since only the area around plants gets water. Farmers using drip irrigation have reported saving up to 60-70% water compared to traditional methods.

Answer the following questions:
(a) How does drip irrigation help in reducing water wastage? (2 marks)
(b) Why would flood irrigation lead to more water loss through evaporation? (1 mark)
(c) Suggest one more method that farmers can use to reduce water evaporation from fields. (1 mark)

20. Case Study 2: Understanding Weather Patterns

Weather forecasters often talk about humidity levels when predicting weather. Humidity is the amount of water vapour present in the air. When humidity is high (above 70-80%), the air feels "sticky" and uncomfortable. Even if the temperature is not very high, high humidity makes us feel hotter.

This happens because our body cools itself through perspiration (sweating). When sweat evaporates from our skin, it takes heat away and cools us. However, when humidity is high, the air is already saturated with water vapour. This means sweat cannot evaporate easily, and we don't feel cool despite sweating. This is why coastal areas feel more uncomfortable in summer compared to dry inland areas, even at the same temperature.

Answer the following questions:
(a) What is humidity? (1 mark)
(b) Why do we feel uncomfortable when humidity is high? (2 marks)
(c) Why do coastal areas feel more humid than inland areas? (1 mark)

DETAILED ANSWER KEY - PAPER 04

SECTION A - Answers to MCQs

1. (c) Ice → Water → Water vapour
This shows the correct sequence from solid to liquid to gas state of water.

2. (b) Covered container
A covered container has the least exposed surface area and trapped humidity, slowing evaporation the most.

3. (c) 100°C
Water boils at 100°C at normal atmospheric pressure.

4. (b) Tiny water droplets are very light and float in air
Clouds are made of extremely tiny water droplets that are light enough to float in air.

5. (c) Formation of fog
Fog is formed when water vapour condenses into tiny water droplets near the ground.

6. (b) Cooling process
Evaporation requires heat energy and causes cooling of the surroundings.

7. (b) Evaporation causes cooling
Water evaporates from the roof taking heat with it, causing a cooling effect.

8. (c) 0°C
Water freezes into ice at 0°C at normal atmospheric pressure.

9. (c) Increase in wind speed
Increased wind speed carries away water vapour quickly, increasing the rate of evaporation.

10. (a) Porous nature of clay allowing evaporation
Water seeps through clay pores and evaporates from the outer surface, causing cooling.

SECTION B - Answers to Short Answer Questions

11.

Water droplets appear on the outer surface of a glass containing ice-cold water due to condensation:
- The outer surface of the glass becomes very cold due to the ice-cold water inside
- Water vapour present in the surrounding air comes in contact with this cold surface
- The water vapour loses heat and condenses into liquid water droplets
- These droplets appear on the outer surface of the glass

12.

Evaporation is considered a surface phenomenon because:

1. Surface-only process:
- Evaporation occurs only at the surface of the liquid, not from within the bulk of the liquid
- Only water molecules at the surface have enough energy to escape into air

2. Depends on surface area:
• The rate of evaporation increases with increase in surface area
• Larger surface means more water molecules can escape simultaneously
• This is why water in a plate evaporates faster than in a bottle

13.

People sprinkle water on village roads during summer because:
• Summer roads become very hot due to sunlight
• When water is sprinkled, it evaporates quickly
• During evaporation, water takes heat from the road and surrounding air
• This causes a cooling effect, making the area more comfortable
• It also helps in settling the dust on unpaved roads

14.

Water spilled on the floor disappears due to evaporation:
• The water is exposed to air
• Heat from the surroundings (room temperature) provides energy to water molecules
• Water molecules at the surface gain enough energy to escape as water vapour
• This water vapour mixes with air and becomes invisible
• The process continues until all water has evaporated and the floor is dry

SECTION C - Answers to Short Answer Questions

15.

Activity to demonstrate that evaporation causes cooling:

Materials Required:
• Hand sanitizer or rubbing alcohol
• Your palm

Procedure:
1. Pour a few drops of hand sanitizer on your palm
2. Spread it evenly over your palm
3. Blow air gently over your palm or wave your hand in the air
4. Observe the sensation you feel

Observation:
• Initially, you feel wetness on your palm
• As you blow air, the sanitizer starts evaporating
• You feel a cooling sensation on your palm
• After a few seconds, your palm feels cold
• The sanitizer disappears completely

Conclusion:
• The hand sanitizer evaporated from your palm
• During evaporation, it took heat energy from your palm
• This removal of heat caused the cooling sensation
• This proves that evaporation is a cooling process

16.

Effect of air movement on evaporation:

Air movement (wind) significantly increases the rate of evaporation:

How it works:
• When water evaporates, water vapour accumulates near the liquid surface
• This accumulated water vapour slows down further evaporation
• Moving air (wind) carries away this water vapour
• Fresh dry air comes in contact with the water surface
• This allows more water to evaporate quickly
• Faster the air movement, faster the evaporation

Example 1 - Drying clothes:
• On a calm day, wet clothes take longer to dry
• On a windy day, the same clothes dry much faster
• This is because wind continuously removes the water vapour from around the clothes
• Allowing more water to evaporate quickly

Example 2 - Using a fan for cooling:
• When we sweat, the sweat needs to evaporate to cool our body
• Without a fan, evaporation is slow and we feel less cool
• When we sit under a fan, the moving air increases evaporation of sweat
• This makes us feel much cooler
• This is why we use fans in summer to feel comfortable

17.

Factors Affecting the Rate of Evaporation:

1. Temperature:
• Higher temperature increases the rate of evaporation
• At high temperatures, water molecules have more kinetic energy
• They can escape more easily from the liquid surface
• Example: Water evaporates faster in summer than in winter
• Water kept in sunlight evaporates faster than water kept in shade
• This is why we prefer to dry clothes on hot sunny days

2. Surface Area:
• Larger the exposed surface area, faster the evaporation
• More surface area means more water molecules are exposed to air
• More molecules can escape simultaneously
• Example: Water spread on a plate evaporates faster than water in a bottle
• This is because the plate has a much larger exposed surface area
• Farmers spread paddy grains on large mats for faster drying

3. Humidity:
• Lower the humidity, faster the evaporation
• Humidity is the amount of water vapour already present in air
• When humidity is low, air can hold more water vapour
• This allows rapid evaporation
• When humidity is high, air is saturated with water vapour

• It cannot hold much more water vapour, so evaporation is slow
• Example: Clothes dry slowly on rainy days because humidity is high
• In desert areas with low humidity, water evaporates very quickly

Other factors:
• Wind speed (discussed in previous question)
• Nature of liquid (different liquids evaporate at different rates)

SECTION D - Answer to Long Answer Question

18.

(a) Processes of Evaporation and Condensation: (3 marks)

EVAPORATION:
Definition: Evaporation is the process of conversion of water from its liquid state to vapour (gaseous) state.

Characteristics:
• Takes place at all temperatures (not just at boiling point)
• Occurs only at the surface of the liquid
• Is a cooling process
• Requires heat energy from surroundings

Examples of Evaporation:
1. Drying of wet clothes on a clothesline
2. Disappearance of water from puddles after rain
3. Drying of floors after mopping
4. Evaporation of sweat from our body
5. Drying of ink on paper
6. Water gradually disappearing from an open container
7. Moisture loss from wet hair after bath

CONDENSATION:
Definition: Condensation is the process of conversion of water vapour (gas) into its liquid state.

Characteristics:
• Occurs when water vapour comes in contact with a cold surface
• Is a warming process (releases heat)
• Opposite of evaporation
• Requires cooling of water vapour

Examples of Condensation:
1. Water droplets on the outer surface of a glass containing ice-cold water
2. Dew drops on grass and leaves in the morning
3. Water droplets on the inner side of lid when cooking
4. Formation of fog (tiny water droplets suspended in air)
5. Mist on bathroom mirror after a hot shower
6. Water droplets on cold water pipes
7. Formation of clouds in the sky

(b) Importance in the Water Cycle: (2 marks)

Evaporation and condensation are the two most important processes in the water cycle:

Role of Evaporation:
• Evaporation is responsible for taking water from Earth's surface to the atmosphere
• Water from oceans, rivers, lakes, and other water bodies evaporates due to sun's heat
• This forms water vapour which rises up in the atmosphere
• Without evaporation, water would remain only on Earth's surface
• It also helps in distributing water across different regions
• Evaporation from plants (transpiration) also contributes to atmospheric water vapour

Role of Condensation:
• Condensation brings water vapour back to Earth's surface
• As water vapour rises, it cools and condenses around dust particles to form clouds
• Tiny droplets in clouds combine to form larger drops
• When these drops become heavy, they fall as rain, snow, or hail
• This returns water to Earth, completing the cycle
• Without condensation, water would remain as vapour in the atmosphere

Together in the Water Cycle:
• These two processes work together to maintain the water cycle
• They ensure continuous circulation of water between Earth and atmosphere
• This circulation is essential for all life on Earth
• It maintains freshwater supply through rainfall
• Helps in temperature regulation of Earth
• Supports agriculture and ecosystems
• Without these processes, water distribution would be impossible

SECTION E - Answers to Case Study Based Questions

19. Case Study 1 - Water Conservation in Agriculture

(a) How drip irrigation reduces water wastage: (2 marks)

Drip irrigation reduces water wastage in multiple ways:

1. Minimizes evaporation losses:
• Water is delivered directly to plant roots through pipes
• There is no large exposed water surface
• Very little water is exposed to air and sunlight
• Therefore, evaporation is minimal compared to flood irrigation
• In flood irrigation, water covers large areas and evaporates quickly

2. Prevents runoff and seepage:
• Water is released slowly drop by drop
• It is absorbed by soil immediately near plant roots
• No excess water flows away or seeps deep below root zone
• Every drop reaches the plant that needs it

3. Targeted delivery:
• Water goes only where needed (near plant roots)
• No water is wasted on areas between plants

• This is much more efficient than watering entire fields

(b) Why flood irrigation leads to more water loss: (1 mark)

Flood irrigation leads to more water loss through evaporation because:
• In flood irrigation, water is spread over large field areas
• This creates a huge exposed surface area
• Large surface area exposed to sunlight causes rapid evaporation
• Much of the water evaporates before it can be absorbed by plant roots
• The water also takes time to seep down, during which continuous evaporation occurs
• Up to 40-50% of water can be lost to evaporation in flood irrigation

(c) Another method to reduce water evaporation from fields: (1 mark)

Mulching:
Farmers can use mulching to reduce water evaporation from fields:
• Mulching involves covering the soil surface with organic materials like straw, dried leaves, grass clippings, or plastic sheets
• This cover reduces direct exposure of soil to sunlight and air
• It significantly reduces evaporation from the soil surface
• Mulch also keeps soil temperature stable and prevents weed growth
• This traditional method is very effective and environmentally friendly

20. Case Study 2 - Understanding Weather Patterns

(a) What is humidity? (1 mark)

Humidity is the amount of water vapour present in the air. It is usually expressed as a percentage. When we say humidity is 80%, it means the air is holding 80% of the maximum water vapour it can hold at that temperature. High humidity means the air contains a large amount of water vapour, while low humidity means the air is relatively dry.

(b) Why we feel uncomfortable when humidity is high: (2 marks)

We feel uncomfortable when humidity is high due to the following reasons:

1. Sweat cannot evaporate:
• Our body maintains temperature by producing sweat when we feel hot
• The cooling mechanism works through evaporation of sweat
• When sweat evaporates, it takes heat from our body, making us feel cool
• However, when humidity is high, the air is already saturated with water vapour
• Saturated air cannot hold much more water vapour
• Therefore, sweat cannot evaporate easily from our skin
• Sweat remains on our body making us feel sticky and wet

2. No cooling effect:
• Since evaporation is very slow, little heat is removed from our body
• Our body cannot cool itself effectively
• We continue to feel hot despite sweating profusely
• This makes us feel more uncomfortable than the actual temperature
• Our body temperature may actually rise, causing further discomfort

3. Feels hotter than actual temperature:

• The combination of high temperature and high humidity is particularly uncomfortable
• The "feels like" temperature (heat index) is much higher than actual temperature
• This is why 35°C with high humidity feels worse than 40°C with low humidity

(c) Why coastal areas feel more humid: (1 mark)

Coastal areas feel more humid than inland areas because:
• Coastal areas are surrounded by large water bodies (seas and oceans)
• Water from these water bodies continuously evaporates
• This adds a large amount of water vapour to the air
• Sea breeze carries this moist air inland along the coast
• Therefore, the air in coastal areas has high water vapour content
• Inland areas are far from large water bodies
• They receive less water vapour in the air
• Hence, inland areas generally have lower humidity than coastal areas

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