

3. Hydrologic Cycle

Class: VIII

Subject: Social (Geo)

I. Choose the Correct answer

- The process in which the water moves between the oceans, atmosphere and land is called
a) River Cycle **b) Hydrologic Cycle** c) Rock Cycle d) Life Cycle
- The percentage of fresh water on the earth is
a) 71 b) 97 **c) 2.8** d) 0.6
- The process of changing of water from gaseous to liquid form is known as
a) Condensation b) Evaporation c) Sublimation d) Rainfall
- Water that flows in the sub-soil or through the ground into the streams, rivers, lakes and oceans is termed as
a) Condensation b) Evaporation c) Transpiration **d) Runoff**
- The evaporation of water from the leaves of plants is called
a) Transpiration b) Condensation c) Water vapour d) Precipitation
- Water that is good enough to drink is called
a) Groundwater b) Surface water **c) Potable water** d) Artesian water

II. Fill in the blanks

- The degree of water vapour present in the atmosphere is known as Humidity.
- There are Three phases in the water cycle.
- The falling of water towards the earth surface from atmosphere in any form is known as Precipitation.
- The precipitation with the rain drop size of <0.5mm in diameter is known as Drizzle.
- Mist is denser than Fog.

III. Match the following

- | | | | |
|------------------------|---|----------------|---|
| 1. Vegetation | - | Clouds | 4 |
| 2. Condensation | - | Sleet | 1 |
| 3. Snow and rain Drops | - | At the surface | 2 |
| 4. Infiltration | - | Transpiration | 3 |

IV. Choose the correct statement

1. Evaporation refers to

I. The process in which the gaseous form of water changes in to liquid

II. It refers to the process in which the liquid form of water changes into gaseous form.

III. Water boils at 100oC temperature but, it actually begins to evaporate at 0oC.

IV. It is responsible for the formation of clouds.

a) I and IV are correct

b) II only correct

c) II and III are correct

d) All are correct

V. State whether the following statements are True or False

1. Water boils at 212 °F temperature but, it begins to evaporate at 32 °F. **True**

2. Mist is not the tiny droplets of water hanging in the air. **False**

3. The sub-surface runoff is usually referred as interflow. **True**

VI Answer briefly

1. Write a short note on aquifer.

It is an underground layer of water – bearing rocks.

2. Define “hydrological cycle”.

Hydrological cycle is a global sun-driven process where water is transported from oceans to atmosphere, from atmosphere to land and from land back to oceans.

3. How is the dew formation takes place?

It is a water droplet formed by the condensation of water vapour on a relatively cold surface of an object.

It forms when the temperature of an object drops below the dew point temperature.

4. Write a short note on surface run-off.

It is the portion of rainfall, which enters the stream immediately after the rainfall. It occurs, when the rainfall is longer, heavier and exceeds the rate of infiltration.

In this condition the excess water makes a head over the ground surface, which tends to move from one place to another following land gradient and is known as overland flow.

When the overland flow joins the streams, channels or oceans, it is termed as surface runoff or surface flow.

VII. Give reasons

1. Infiltration of water is low in the region of non-porous soil.

Water entering the soil at the surface of the ground is termed as infiltration.

Infiltration allows the soil temporarily to store water, The rate of infiltration is influenced by the physical characteristics of the soil, vegetative cover, moisture content of the soil, soil temperature and rainfall intensity.

2. Fresh water is less on the earth.

Most of the water on the earth is saline and is found in seas and oceans. The salt water constitutes about 97.2%.

3. Snowfall is common in the polar region and mountainous regions.

Often water vapour in a cloud is converted directly into snow pieces due to lowering of temperature. It appears like a powdery mass of ice.

The precipitation in the form of powdery mass of ice is known as snowfall. It is common in the polar and high mountainous regions.

VIII. Answer in a paragraph

1. Explain the different stages involved in the hydrological cycle.

The three important phases of the hydrologic cycle are:

- a) Evapotranspiration,
- b) Precipitation and
- c) Runoff.

a) Evapotranspiration

- It is defined as the total loss of water from the earth through evaporation from the surface water bodies and the transpiration from vegetation.
- In cropped area, it is difficult to determine the evaporation and transpiration separately. Therefore it is collectively called as evapotranspiration.

b) Precipitation

- Precipitation refers to all forms of water that fall from clouds and reaches the earth's surface.
- For the occurrence of precipitation, cloud droplets or ice crystals must grow heavy enough to fall through the air. When the droplets grow large in size, they tend to fall.
- While moving down, by collecting some small droplets, they become heavy enough to fall out of the cloud as raindrops.

Runoff

- Runoff is the water that is pulled by gravity across land's surface. It replenishes groundwater and surface water as it percolates into an aquifer (it is an underground layer of water-bearing rock) or moves into a river, stream or watershed.

- It comes from unabsorbed water from rain, snowmelt, irrigation or other sources, comprising a significant element in the water cycle as well as the water supply when it drains into a watershed.
- Runoff is also a major contributor to the erosion which carves out canyons, gorges and related landforms.

2. Distinguish between evaporation and transpiration.

Evaporation	Transpiration
Evaporation refers to the process in which the liquid form of water changes into gaseous form. Temperature is the prime element which affects the rate of evaporation.	Transpiration refers to the process by which the water content in the plants are released into the atmosphere in the form of water vapour.
There is a positive relationship between these two variables. Areal extent of surface water, wind and the atmospheric humidity.	Much of the water taken up by plants is released through transpiration. The rate of transpiration is also affected by the temperature, wind and humidity.
The atmosphere gets nearly 90% of moisture from the oceans, seas, lakes and rivers through evaporation.	10% of the moisture from plants through transpiration.

3. Give a detailed explanation on different forms of precipitation.

The form of precipitation in a region depends on the kind of weather or the climate of the region. Common types of precipitation are rain, sleet, freezing rain, hail and snow.

Rain:

- The most common kind of precipitation is rain. The precipitation in the form of water droplets is called rain.

- The precipitation in which the size of rain drops are <0.5 mm in diameter is known as drizzle and the rain drops with >0.5 mm in diameter is known as rain. Generally drizzle takes place from stratus clouds.

Sleet:

- The precipitation which takes place in the form of mixture of water droplets and tiny particles of ice (5mm in diameter) is known as sleet.
- Sometimes raindrops fall through a layer of air below 0°C , the freezing point of water.
- As they fall, the raindrops freeze into solid particles of ice. So, the mixture of water droplets and ice particles would fall on the earth surface.

Freezing Rain:

- Some times raindrops falling through cold air near the ground do not freeze in the air. Instead, the raindrops freeze when they touch a cold surface.
- This is called freezing rain and the drops of water are usually greater than 0.5 mm in diameter.

Hail:

- The precipitation which consists of round pellets of ice which are larger than 5 mm in diameter is called hail or hailstones. Hail forms only in cumulonimbus clouds during thunderstorms.
- A hailstone starts as an ice pellet inside a cold region of a cloud. Strong updrafts in the cloud carry the hailstone up and down through the cold region many times.

Snow:

- Often water vapour in a cloud is converted directly into snow pieces due to lowering of temperature. It appears like a powdery mass of ice.
- The precipitation in the form of powdery mass of ice is known as snowfall. It is common in the polar and high mountainous regions.

4. Explain the run-off and its types.

Based on the time interval between the instance of rainfall and generation of runoff, the runoff may be classified into following three types.

i) Surface Runoff:

- It is the portion of rainfall, which enters the stream immediately after the rainfall. It occurs, when the rainfall is longer, heavier and exceeds the rate of infiltration.
- In this condition the excess water makes a head over the ground surface, which tends to move from one place to another following land gradient and is known as overland flow.
- When the overland flow joins the streams, channels or oceans, it is termed as surface runoff or surface flow.

ii) Sub-Surface Runoff:

- The water that has entered the subsoil and moves laterally without joining the water-table to the streams, rivers or oceans is known as sub-surface runoff.
- The sub-surface runoff is usually referred as interflow.

iii) Base Flow:

- It is a flow of underground water from a saturated ground water zone to a water channel.
- It usually appears at a downstream location where the channel elevation is lower than the groundwater table. Groundwater provides the stream flow during dry periods of small or no precipitation.