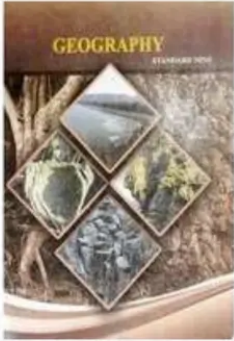


Maharashtra Board Solutions for Class 9- Geography: Chapter 6- Properties of Sea Water

BOOK SOLUTIONS
CLASS 9
GEOGRAPHY

CHAPTER 6
Properties of Sea Water

IndCareer



Maharashtra Board Solutions→

For any clarifications or questions you can write to info@indcareer.com

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Maharashtra Board Solutions for Class 9- Geography: Chapter 6- Properties of Sea Water

Class 9: Geography Chapter 6 solutions. Complete Class 9 Geography Chapter 6 Notes.

Maharashtra Board Solutions for Class 9- Geography: Chapter 6- Properties of Sea Water

Maharashtra Board 9th Geography Chapter 6, Class 9 Geography Chapter 6 solutions

Questions and Answers

1. Tick the correct box according to the salinity of the ocean water ✓

	Salinity		
	High	Medium	Low
(a) Slanting sunrays, melting snow	☐	☐	☐
(b) Cloudy sky, rainfall throughout the year	☐	☐	☐
(c) Clear skies for the most part, perpendicular sunrays	☐	☐	☐
(d) Less supply of freshwater, desert area around	☐	☐	☐
(e) Low temperatures, ample supply of river water	☐	☐	☐
(f) Continental location, desert around, low rainfall	☐	☐	☐

Answer:

(a) Low

(b) Low

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(c) High

(d) High

(e) Low

(f) High.

2. Give reasons.

(a) Salinity is low in the land-locked Baltic Sea.

Answer:

- The Baltic Sea lies in the temperate region.
- In temperate regions, the sunrays are slanting and therefore, the temperatures are lower.
- The supply of fresh water is also more, as numerous rivers empty their waters into the Baltic sea.
- Therefore, in spite of being landlocked, due to low rate of evaporation and ample supply of fresh water, the salinity of the Baltic Sea is low.

(b) There is higher salinity in the northern Red Sea while lower in the southern.

Answer:

- The Red Sea is one of the saltiest bodies of water in the world, owing to high evaporation.
- The salinity is 36‰ in the southern part because of the effect of the Gulf of Aden.
- It reaches 41 ‰ in the northern part, owing mainly to the Gulf of Suez and the high evaporation as well as very little precipitation.
- Hence, there is more salinity in the northern Red Sea while lesser in the south.

(c) Oceans located at the same latitude do not have same salinity.

Answer:

- The salinity of the oceans depends on factors like rate of evaporation and supply of fresh water.
- In Oceans where rate of evaporation is more than the supply of fresh water, the salinity is higher.
- In Oceans where supply of freshwater exceeds the rate of evaporation, salinity is low.

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- Salinity is not affected much in areas where supply of freshwater and the evaporation of water is low.
- Thus, oceans located on the same latitude do not have the same salinity.

(d) With increasing depth, the temperature of sea water decreases to a certain limit.

Answer:

With increasing depth, the temperature of sea water decreases to a certain limit because –

- While most of the sunrays radiate back from the surface of the sea, some of them penetrate to certain depths in the water.
- As a result, the intensity of sunrays decreases with the increasing depth.
- The temperature decreases up to 2000m depth.
- After 2000m, the temperature of the seawater is uniform everywhere.

(e) There are more salt-pans on the Western coast of India than its eastern coast.

Answer:

- The Arabian Sea lies lying to the west and Bay of Bengal lies to the east of India.
- Many large peninsular rivers drain their waters in the Bay of Bengal and on the contrary, only small seasonal coastal rivers drain in the Arabian Sea.
- Hence, the salinity of the eastern coast is 34%, while it is 35% in the Arabian Sea.
- Thus, there are more salt-pans on the Western coast of India than its Eastern coast.

(f) Salinity increases in the mid-latitudinal zones.

Answer:

- Mid-latitudinal zones lies between 25° to 35° north and south of the equator.
- In this zone, the rainfall is less and the supply of fresh water from rivers is also low.
- This region experiences high-temperature conditions which are marked by the presence of hot deserts of the world. These high-temperature conditions lead to a high rate of evaporation.
- Thus, the salinity of the seas is found to be higher in mid-latitudinal zones.

3. Answer the following questions.

(a) What are the factors affecting the salinity of the sea water?

Answer:

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1. The uneven distribution of temperature on earth and uneven supply of freshwater affects the salinity of seawater.
2. In the tropical zone, temperature is higher. Rate of evaporation is also higher and therefore, the salinity is higher.
3. Around 5° N and S of the equator, in the equatorial calm belt, the sky is cloudy for a long period of time and convectional rainfall occurs every day.
4. Large rivers like Congo and Amazon in the equatorial regions meet the sea. Therefore, supply of freshwater is abundant, too. But because of higher temperatures, rate of evaporation is more and therefore, the seas in these areas are more saline.
5. In mid-latitudinal zones (25° to 35° N and S), rainfall is lesser and the supply of freshwater from rivers is also low. This zone has the hot deserts of the world. Thus, the salinity of the seas is found to be higher here.
6. In temperate regions, the sunrays are slanting and therefore, the temperatures are lower. Because of the melting of the snow, the supply of water is also more, and therefore, in this zone, salinity decreases with increasing latitudes.
7. In the polar areas, temperatures are very low. Evaporation is also very less in polar areas. So, salinity is low.
8. Landlocked seas have higher salinity than open seas as the rate of evaporation is more. There is a lack of supply of fresh water from large rivers. Thus, there is a difference in the salinities of open and closed seas.

(b) Explain the distribution of salinity around the Tropic of Cancer and tropic of Capricorn.

Answer:

- The uneven distribution of temperature on earth, and uneven supply of freshwater affects the salinity of sea water.
- Region, between the Tropic of Cancer and Tropic of Capricorn is called as the Tropical zone.
- In the tropical zone, temperature is higher.
- Hence, the rate of evaporation is also higher, and therefore, salinity is higher.

(c) What are the factors affecting the temperature of the sea water?

Answer:

1. Temperature is a major property of the sea water.
2. Sea water upto the depth of 500m is called as surface water. The surface temperature of the sea water is not uniform everywhere. This is dependent on different factors. .

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3. Latitudinally, the surface temperature of the seawater decreases from the equatorial areas towards the poles.
4. The average temperature in equatorial areas is around 25° C, while it is about 2° C near the poles.
5. Besides this, cyclones, rainfall, sea waves, ocean currents, salinity, pollution, convectional currents, and seasons also affect the surface temperature.
6. Regions where cold ocean currents flow, the surface temperature of ocean water is less, while the regions where the warm currents move, the temperature increase.

(d) Explain the changes occurring in the temperature of sea water according to the depth.

Answer:

- While most of the sunrays radiate back from the surface of the sea, some of them penetrate to certain depths in the water.
- As a result, the intensity of sunrays decreases with the increasing depth.
- The temperature decreases up to 2000m depth.
- After 2000m, the temperature of the seawater is uniform everywhere.
- It is around 4°C everywhere from the equatorial regions to the polar areas.
- Temperature reduces only up to 4° C according to depth, and therefore, the water at greater depths does not freeze.
- The temperature of the seawater changes rapidly with depth at the equatorial areas. The difference in temperature is lesser in polar areas.
- There is also a difference in open seas and landlocked seas. In low latitudes, because the salinity of the landlocked seas is more, the temperature of the landlocked seas is higher than the open seas.

(e) Name the factors affecting salinity.

Answer:

Due to the sun's heat, evaporation happens at a faster rate. Evaporated water turns into water vapour and reduces in quantity. But amount of salt remains the same in the remaining water and therefore the salinity of water increases.

- In seas where the rate of evaporation is high than the supply of fresh water, salinity is high.
- In seas where the supply of freshwater exceeds the rate of evaporation, salinity is low.
- Salinity is not affected much in seas where both the supply of freshwater and evaporation of water is low.

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4. Explain how temperature affects the following.

(a) the density of sea water

Answer:

- If temperature reduces, density of water increases.
- Hence, cold water is denser than hot water.

(b) the salinity of sea water

Answer:

- If the salinity of water is high, the density of water increases.

Activity:

Complete the table showing the salinity of open and land-locked seas.

Evaporation of water			Supply of freshwater			
Region	Latitude	Solar Energy	Rainfall	River water	Snow water	Average salinity
Equatorial	0° to 15°	High	Perennial	High	-----	34‰
Tropical	15° to 35°	-----	Seasonal	-----	-----	37‰
Temperate	35° to 65°	Low	-----	-----	-----	33‰
Polar	65° to 90°	-----	-----	low	ample	31‰
Landlocked Sea		Solar Energy	Rainfall	River water	Snow water	Average salinity
Mediterranean Sea		High	low	low	-----	39‰
Red Sea		-----	-----	-----	-----	41‰
Baltic Sea		low	-----	Medium	-----	7‰
Dead Sea		-----	Very less	Very less	-----	332‰
Caspian Sea		-----	-----	-----	-----	155‰
Great Salt lake		medium	-----	-----	-----	220‰

Answer:

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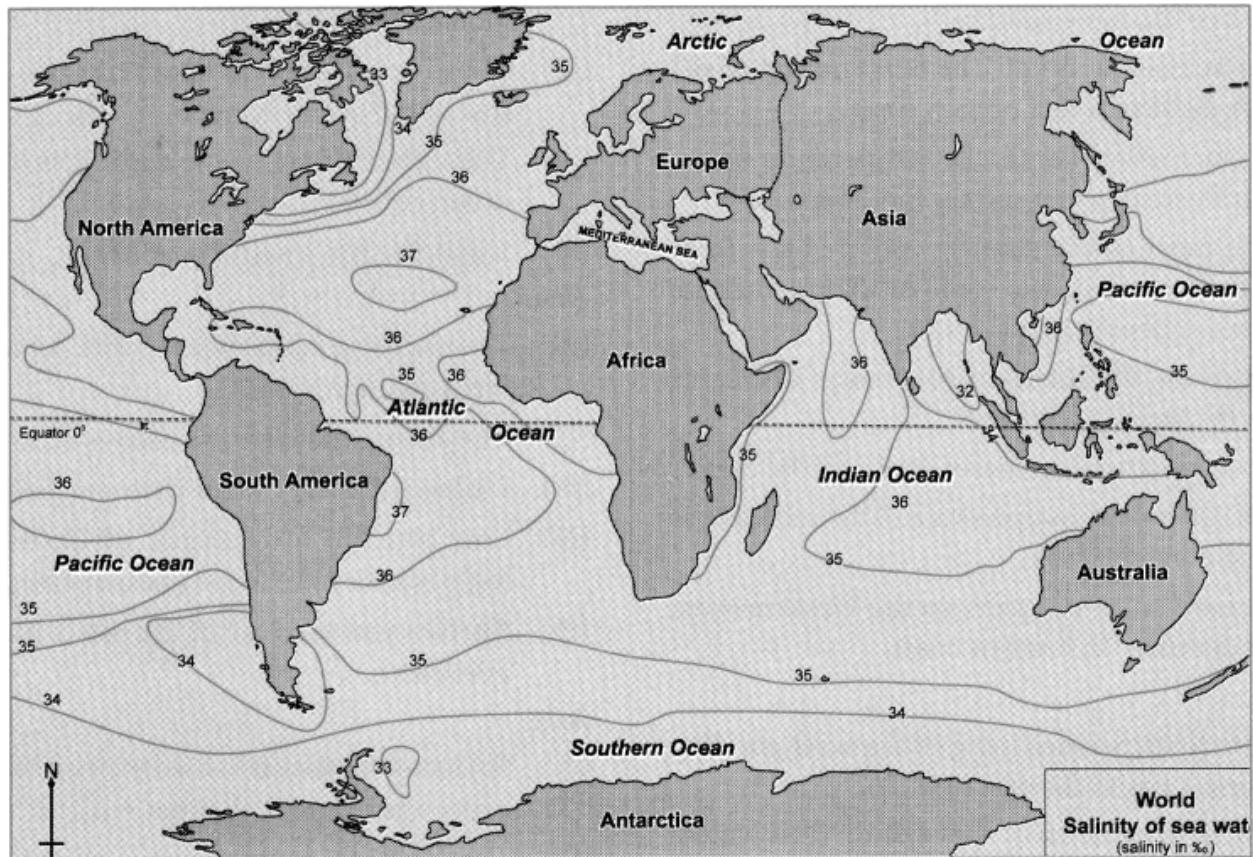
Evaporation of Water			Supply of freshwater			
Region	Latitude	Solar Energy	Rainfall	River water	Snow water	Average salinity
Equatorial	0° C to 15° C	High	Perennial	High	-	34‰
Tropical	15° C to 35° C	<u>Medium</u>	Seasonal	<u>Low</u>	-	37‰
Temperate	35° C to 65° C	Low	<u>Seasonal</u>	<u>Medium</u>	-	33‰
Polar	65° C to 90° C	<u>Low</u>	<u>Seasonal</u>	<u>Low</u>	Ample	31‰

Landlocked sea	Solar Energy	Rainfall	River water	Snow water	Average salinity
Mediterranean sea	High	Low	Low	-	39‰
Red sea	<u>High</u>	<u>Low</u>	<u>Very Low</u>	-	41‰
Baltic sea	Low	<u>Medium</u>	Medium	-	7‰
Dead sea	<u>High</u>	Very less	Very less	-	332‰
Caspian sea	<u>Medium</u>	<u>Low</u>	<u>Low</u>	-	155‰
Great Salt lake	Medium	<u>Low</u>	<u>Low</u>	-	220‰

Questions and Answers

Observe the following Map and answer the questions:

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Question 1.

What is the salinity around the tropics?

Answer:

The salinity around the tropics is 36‰.

Question 2.

Which region has the least salinity?

Answer:

The Bay of Bengal has the least salinity of 32‰.

Question 3.

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Which ocean has salinity more than 37‰?

Answer:

Atlantic ocean has salinity of more than 37‰.

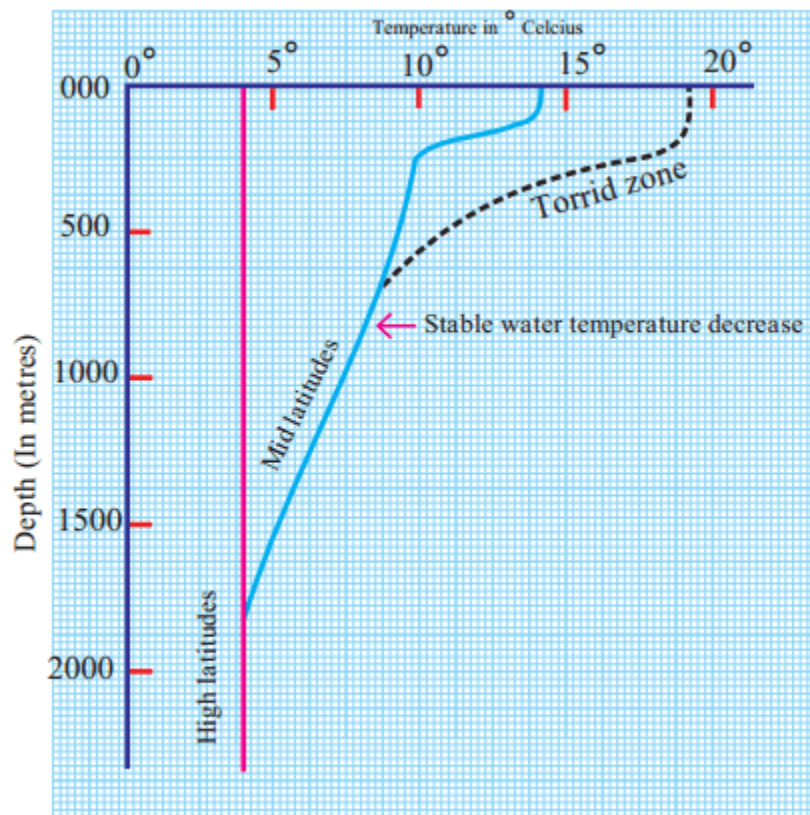
Question 4.

What are the reasons of differences in salinity on a global level?

Answer:

The uneven distribution of temperature on earth, and uneven supply of freshwater, etc. are the reasons for differences in salinity on a global level.

Observe the Graph and answer the questions:



Depth and temperature of seawater

Question 1.

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What is the maximum temperature of seawater in equatorial areas? How much is this temperature at a depth of 500 m?

Answer:

The maximum temperature of sea water in equatorial areas is 18°C . The temperature at the depth of 500 m is 11°C .

Question 2.

What is the temperature of seawater at the sea level in the mid-latitudes?

Answer:

The temperature of seawater at the sea level in the mid-latitudes is 14°C approximately.

Question 3.

How much has this temperature changed at 1500 m depth?

Answer:

The temperature is about 5°C at the depth of 1500 m. Thus the temperature of sea water at mid-latitudes has changed from 14°C at the sea level to about 5°C at the depth of 1500 m i.e. temperature has changed (reduced) by 9°C .

Question 4.

What does the thermal graph for the high latitude say? What is its temperature at 500, 1000 and 1500 m depths?

Answer:

In high latitudes the temperature of sea water at all depths remains constant at 4°C .

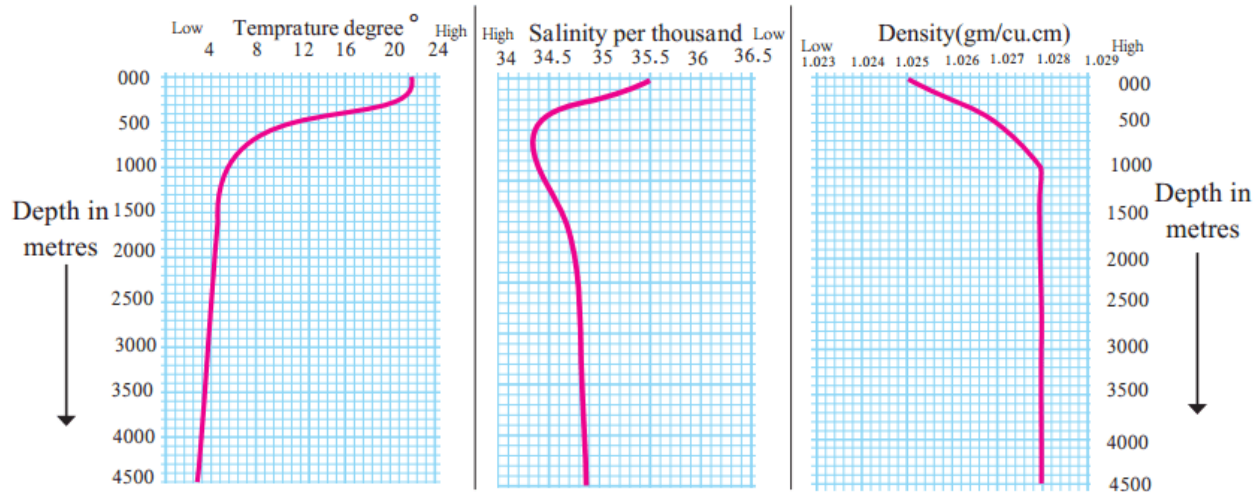
Question 5.

After what depth does the seawater temperature remain stable everywhere?

Answer:

After 2000 m, the temperature of the sea water is uniform everywhere.

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Distribution of temperature, salinity and density of seawater according to depth.

Question 6.

With increasing depth, what decreases: temperature, salinity or density?

Answer:

Temperature and salinity decreases with increasing depth.

Question 7.

After what depth does the change in these factor become almost zero?

Answer:

After the depth of 1000 m there is no change in all these factors.

Question 8.

Till what depth is the change in these factors higher?

Answer:

The higher change can be seen up to a depth of about 500m.

Question 9.

Explain the correlation between all the three factors.

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Answer:

If the temperature is less, density is more. If the salinity is less, then density is also less. However temperature affects the density more as compared to the salinity. If the temperature is less, then the density is more despite less salinity.

Let's Recall.**Question 1.**

Which is the largest water storage of the world?

Answer:

Oceans are the largest water storage of the world.

Question 2.

Why is the seawater salty?

Answer:

- Salt in the ocean comes from rocks on land.
- Rivers carry dissolved salts to the ocean.
- Water evaporates from the oceans to fall again as rain and to feed the rivers, but the salts remain in the ocean.

Question 3.

What are the reasons for high salinity in the oceans?

Answer:

High rate of evaporation and low supply of fresh water leads to high salinity in the oceans:

Question 4.

How can we obtain the salts from the ocean water?

Answer:

- Sea water contains a large amount of common salt and the salts of other metals dissolved in it.

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- Near the sea-shore, the sea water is collected in shallow pits (salt pans) and allowed to evaporate in the sunshine.
- In a few days, the water evaporates, leaving behind salt.
- The salt so obtained is collected and transported to factories, where it is purified and packed for consumption.

Question 5.

What is the use of the salts in the oceans to us?

Answer:

- The salts is used in the food we eat.
- It is used for making various chemicals and medicines.
- Salt is also used to preserve things for longer periods. It is also used in ice factories.

Can You Tell?

Question 1.

What is the difference in the temperatures of the land and the sea?

Answer:

During the daytime land is hotter than the sea whereas, during the night time land is cooler than the sea.

Question 2.

What would be the difference in the temperature of the seawater from the equatorial region to the polar areas?

Answer:

Latitudinally, the surface temperature of the seawater decreases from the equatorial areas towards the poles. The average temperature in equatorial areas is around 25° C while it is about 2° C near the poles.

Think about it.

Question 1.

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If you think about India there is the Arabian sea to the west and the Bay of Bengal to the east. The salinity of the eastern coast is 34‰ while it is 35‰ in the Arabian sea. What could be the reason of higher salinity in the western coastal region?

Answer:

Many large peninsular rivers drain their waters in the Bay of Bengal and on the contrary only small seasonal coastal rivers drain in the Arabian sea. Hence the salinity of Arabian sea is more than the Bay of Bengal.

Try this.

Question 1.

In which container has the water increased or decreased?

Answer:

- The water has increased in the container which is in the classroom in which freshwater was added.
- The water has decreased in the container which was kept in the sun outside.

Question 2.

What could be the reasons behind the decrease or increase?

Answer:

- Since freshwater was added to one of the containers in the classroom the water level increased.
- The water has decreased in the container which was kept outside in the sun due to evaporation.

Question 3.

What could be the reason behind the low and high salinity of the water in the container?

Answer:

- In the container which as kept outside in the sun, due to high rate of evaporation, the salinity is high.
- As we kept on adding fresh water to the container kept in the classroom the salinity is low.

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Additional Important Questions and Answers

Select the correct option:

Question 1.

The average temperature in equatorial areas is

- (a) 25°C
- (b) 35°C
- (c) 15°C
- (d) 5°C

Answer:

- (a) 25°C

Question 2.

The average temperature in mid-latitudes is

- (a) 25°C
- (b) 10°C
- (c) 16°C
- (d) 5°C

Answer:

- (c) 16°C

Question 3.

The average temperature near poles is about

- (a) 10°C
- (b) 20°C

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(c) 15° C

(d) 2° C

Answer:

(d) 2°C

Question 4.

With the increasing depth of sea, the intensity of sunrays

(a) increases

(b) decreases

(c) remains constant

(d) is uneven

Answer:

(b) decreases

Question 5.

Seawater upto the depth of 500m is called

(a) ground water

(b) surface water

(c) deep water

(d) saline water

Answer:

(b) surface water

Question 6.

ocean is the most saline ocean in the world.

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- (a) Pacific
- (b) Arctic
- (c) Indian
- (d) Atlantic

Answer:

- (d) Atlantic

Question 7.

The sea lying on the border of Israel and Jordan has a salinity of ‰.

- (a) 37
- (b) 50
- (c) 256
- (d) 332

Answer:

- (d) 332

Question 8.

The buoyancy of the sea water increases because of its

- (a) evaporation
- (b) salinity
- (c) density
- (d) high temperature

Answer:

- (b) salinity

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Question 9.

has an altitude of – 400m.

- (a) Baltic Sea
- (b) Arabian Sea
- (c) Dead Sea
- (d) the Mediterranean Sea

Answer:

- (c) Dead sea

Question 10.

act as temperature controllers at a global level.

- (a) Ocean currents
- (b) Sea breeze
- (c) Land breeze
- (d) Trade winds

Answer:

- (a) Ocean currents

Question 11.

is a major property of the sea water.

- (a) Temperature
- (b) Uniform salinity
- (c) Buoyancy
- (d) Equal Density

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Answer:

(a) Temperature

Question 12.

have higher salinity than open seas.

(a) Equatorial seas

(b) Landlocked seas

(c) Freshwater lakes

(d) Seas in polar regions

Answer:

(b) landlocked seas

Question 13.

Temperature decreases upto depth.

(a) 500 m

(b) 1000 m

(c) 1500 m

(d) 2000 m

Answer:

(d) 2000m

Question 14.

In regions where cold currents flow, the surface temperature of ocean water is

(a) high

(b) less

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(c) uniform

(d) uneven

Answer:

(b) less

Question 15.

Temperature of seawater changes rapidly with depth in areas.

(a) equatorial

(b) mid latitudinal

(c) temperate

(d) polar

Answer:

(a) equatorial

Question 16.

In seas where the rate of evaporation is than the supply of fresh water, salinity is high.

(a) less

(b) high

(c) same

(d) low

Answer:

(b) high

Question 17.

The salinity of Bay of Bengal is than that of Arabian sea.

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- (a) less
- (b) more
- (c) same
- (d) equal

Answer:

- (a) less

Question 18.

In areas the salinity of sea water is low.

- (a) equatorial
- (b) mid-latitudinal
- (c) temperate
- (d) polar

Answer:

- (d) polar

Question 19.

The salinity of Baltic sea is %.

- (a) 332
- (b) 32
- (c) 37
- (d) 7

Answer:

- (d) 7

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Match the Column:

Column A

Column B

- | | |
|------------------------|--|
| (1) Equatorial areas | (a) Salinity of 332‰ |
| (2) Mid-latitude areas | (b) Slanting sunrays, melting of snow |
| (3) Temperate regions | (c) Cloudy sky and convectional rainfall |
| | (d) Hot deserts |

Answer:

(1-c),

(2- d),

(3 – b)

Answer in one sentence:**Question 1.****What is the major property of seawater?****Answer:**

Temperature is a major property of seawater.

Question 2.**What is the average surface temperature of seawater in equatorial areas, mid-latitudes & poles?****Answer:**

The average surface temperature of seawater in equatorial areas is around 25°C in mid-latitude it is around 16°C & 2°C near the poles.

Question 3.**After what depth is the seawater temperature uniform everywhere?**

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Answer:

After 2000m, the temperature of seawater is uniform everywhere

Question 4.

Name the instruments used to measure salinity?

Answer:

Hydrometer, Refractometer and salinometer are used to measure salinity.

Question 5.

Which is the most saline ocean?

Answer:

The Atlantic ocean is the most saline ocean.

Give geographical reasons:

Question 1.

The climate of the earth gets affected by ocean currents.

Answer:

- The ocean currents are generated because of the difference in the properties of seawater.
- They act as temperature controllers at the global level.
- The distribution of temperature gets controlled due to the ocean currents.
- Thus, the climate of the earth gets affected by ocean currents.

Question 2.

Dead Sea has a salinity of 332‰.

Answer:

- The sea lying on the border of Israel and Jordan has a salinity of 332‰.
- The average salinity of ocean is 35‰.
- Jordan is the only large river meeting this sea.

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- Low rainfall, low supply of freshwater and high evaporation is the reason of high salinity.

Question 3.

The surface temperature of the sea is not uniform everywhere.

Answer:

- The surface temperature of sea water is not uniform everywhere and it changes with latitudes.
- The surface temperature of the seawater decreases from the equatorial areas towards the poles.
- The average temperature in equatorial areas is around 25° C, it is 16° C in mid-latitudes while it is about 2° C near the poles.
- Besides this, cyclones, rainfall, sea waves, ocean currents, salinity, pollution, convergence flow, seasons, etc. also affect the surface temperature.
- Thus the surface temperature of the sea is not uniform everywhere.

Question 4.

The seas in equatorial calm belt are more saline.

Answer:

- Around 5° N and S of the equator, in the equatorial calm belt, the sky is cloudy for a long period of time and convectional rainfall occurs every day.
- Large rivers like Congo and Amazon in the equatorial regions meet the sea.
- Therefore, supply of freshwater abundant too.
- But because of higher temperatures, rate of evaporation is more and therefore, the seas in these areas are more saline.

Explain

Question 1.

Factors affecting surface water temperature

Answer:

- Temperature is a major property of the seawater. The surface temperature of the seawater is not uniform everywhere. This is dependent on different factors.

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- Latitudinally, the surface temperature of the seawater decreases from the equatorial areas towards the poles.
- Besides this, cyclones, rainfall, sea waves, ocean currents, salinity, pollution, convergence flow and seasons also affect the surface temperature.
- Regions where cold ocean currents flow, the surface temperature of ocean water is less. The regions where the warm currents move, the temperature increase.

Question 2.

Density of sea water

Answer:

- Temperature and salinity are the two properties of sea water that control the density of the sea water.
- If temperature reduces, density of water increases.
- Cold water is denser, and so is saline water.
- As compared to salinity, temperature affects the density more. Hence, sometimes, more saline water has lower temperature at the surface.
- Sea water having higher temperature and low salinity, can have lower density.

Question 3.

Measurement of salinity of sea water.

Answer:

- The weight of all dissolved salts in water in ratio of parts per thousand of water is called the salinity of seawater.
- For example, if the weight of dissolved salts in 1000g (1 kg) of seawater is 40g, then the salinity is 40‰ i.e. 40 per thousand parts.
- Hydrometer, refractometer and salinometer are also used to measure salinity.

Question 4.

Factors affecting salinity of sea water.

Answer:

Latitudes	Temperature / Rate of evaporation	Supply of fresh water	Salinity
-----------	-----------------------------------	-----------------------	----------

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Tropical Zone 5°N – 5°S of equator	High	Abundant from (River Congo / Amazon)	High
Midlatitudes (25° – 35° N and S)	High (hot desert are found here)	low	High
Temperate regions	Temperature is lower due to slanting sunrays	The supply of water is more due to melting snow	low
Polar regions	Very low	low	low

Questions and Answers

1. Tick the correct box according to the salinity of the ocean water ✓

	Salinity		
	High	Medium	Low
(a) Slanting sunrays, melting snow	☐	☐	☐
(b) Cloudy sky, rainfall throughout the year	☐	☐	☐
(c) Clear skies for the most part, perpendicular sunrays	☐	☐	☐
(d) Less supply of freshwater, desert area around	☐	☐	☐
(e) Low temperatures, ample supply of river water	☐	☐	☐
(f) Continental location, desert around, low rainfall	☐	☐	☐

Answer:

- (a) Low
- (b) Low
- (c) High
- (d) High
- (e) Low
- (f) High.

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2. Give reasons.

(a) Salinity is low in the land-locked Baltic Sea.

Answer:

- The Baltic Sea lies in the temperate region.
- In temperate regions, the sunrays are slanting and therefore, the temperatures are lower.
- The supply of fresh water is also more, as numerous rivers empty their waters into the Baltic sea.
- Therefore, in spite of being landlocked, due to low rate of evaporation and ample supply of fresh water, the salinity of the Baltic Sea is low.

(b) There is higher salinity in the northern Red Sea while lower in the southern.

Answer:

- The Red Sea is one of the saltiest bodies of water in the world, owing to high evaporation.
- The salinity is 36‰ in the southern part because of the effect of the Gulf of Aden.
- It reaches 41 ‰ in the northern part, owing mainly to the Gulf of Suez and the high evaporation as well as very little precipitation.
- Hence, there is more salinity in the northern Red Sea while lesser in the south.

(c) Oceans located at the same latitude do not have same salinity.

Answer:

- The salinity of the oceans depends on factors like rate of evaporation and supply of fresh water.
- In Oceans where rate of evaporation is more than the supply of fresh water, the salinity is higher.
- In Oceans where supply of freshwater exceeds the rate of evaporation, salinity is low.
- Salinity is not affected much in areas where supply of freshwater and the evaporation of water is low.
- Thus, oceans located on the same latitude do not have the same salinity.

(d) With increasing depth, the temperature of sea water decreases to a certain limit.

Answer:

With increasing depth, the temperature of sea water decreases to a certain limit because –

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- While most of the sunrays radiate back from the surface of the sea, some of them penetrate to certain depths in the water.
- As a result, the intensity of sunrays decreases with the increasing depth.
- The temperature decreases up to 2000m depth.
- After 2000m, the temperature of the seawater is uniform everywhere.

(e) There are more salt-pans on the Western coast of India than its eastern coast.

Answer:

- The Arabian Sea lies lying to the west and Bay of Bengal lies to the east of India.
- Many large peninsular rivers drain their waters in the Bay of Bengal and on the contrary, only small seasonal coastal rivers drain in the Arabian Sea.
- Hence, the salinity of the eastern coast is 34%, while it is 35% in the Arabian Sea.
- Thus, there are more salt-pans on the Western coast of India than its Eastern coast.

(f) Salinity increases in the mid-latitudinal zones.

Answer:

- Mid-latitudinal zones lies between 25° to 35° north and south of the equator.
- In this zone, the rainfall is less and the supply of fresh water from rivers is also low.
- This region experiences high-temperature conditions which are marked by the presence of hot deserts of the world. These high-temperature conditions lead to a high rate of evaporation.
- Thus, the salinity of the seas is found to be higher in mid-latitudinal zones.

3. Answer the following questions.

(a) What are the factors affecting the salinity of the sea water?

Answer:

1. The uneven distribution of temperature on earth and uneven supply of freshwater affects the salinity of seawater.
2. In the tropical zone, temperature is higher. Rate of evaporation is also higher and therefore, the salinity is higher.
3. Around 5° N and S of the equator, in the equatorial calm belt, the sky is cloudy for a long period of time and convectional rainfall occurs every day.
4. Large rivers like Congo and Amazon in the equatorial regions meet the sea. Therefore, supply of freshwater is abundant, too. But because of higher temperatures, rate of evaporation is more and therefore, the seas in these areas are more saline.

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5. In mid-latitudinal zones (25° to 35° N and S), rainfall is lesser and the supply of freshwater from rivers is also low. This zone has the hot deserts of the world. Thus, the salinity of the seas is found to be higher here.
6. In temperate regions, the sunrays are slanting and therefore, the temperatures are lower. Because of the melting of the snow, the supply of water is also more, and therefore, in this zone, salinity decreases with increasing latitudes.
7. In the polar areas, temperatures are very low. Evaporation is also very less in polar areas. So, salinity is low.
8. Landlocked seas have higher salinity than open seas as the rate of evaporation is more. There is a lack of supply of fresh water from large rivers. Thus, there is a difference in the salinities of open and closed seas.

(b) Explain the distribution of salinity around the Tropic of Cancer and tropic of Capricorn.

Answer:

- The uneven distribution of temperature on earth, and uneven supply of freshwater affects the salinity of sea water.
- Region, between the Tropic of Cancer and Tropic of Capricorn is called as the Tropical zone.
- In the tropical zone, temperature is higher.
- Hence, the rate of evaporation is also higher, and therefore, salinity is higher.

(c) What are the factors affecting the temperature of the sea water?

Answer:

1. Temperature is a major property of the sea water.
2. Sea water upto the depth of 500m is called as surface water. The surface temperature of the sea water is not uniform everywhere. This is dependent on different factors. .
3. Latitudinally, the surface temperature of the seawater decreases from the equatorial areas towards the poles.
4. The average temperature in equatorial areas is around 25° C, while it is about 2° C near the poles.
5. Besides this, cyclones, rainfall, sea waves, ocean currents, salinity, pollution, convectional currents, and seasons also affect the surface temperature.
6. Regions where cold ocean currents flow, the surface temperature of ocean water is less, while the regions where the warm currents move, the temperature increase.

(d) Explain the changes occurring in the temperature of sea water according to the depth.

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Answer:

- While most of the sunrays radiate back from the surface of the sea, some of them penetrate to certain depths in the water.
- As a result, the intensity of sunrays decreases with the increasing depth.
- The temperature decreases up to 2000m depth.
- After 2000m, the temperature of the seawater is uniform everywhere.
- It is around 4°C everywhere from the equatorial regions to the polar areas.
- Temperature reduces only up to 4° C according to depth, and therefore, the water at greater depths does not freeze.
- The temperature of the seawater changes rapidly with depth at the equatorial areas. The difference in temperature is lesser in polar areas.
- There is also a difference in open seas and landlocked seas. In low latitudes, because the salinity of the landlocked seas is more, the temperature of the landlocked seas is higher than the open seas.

(e) Name the factors affecting salinity.

Answer:

Due to the sun's heat, evaporation happens at a faster rate. Evaporated water turns into water vapour and reduces in quantity. But amount of salt remains the same in the remaining water and therefore the salinity of water increases.

- In seas where the rate of evaporation is high than the supply of fresh water, salinity is high.
- In seas where the supply of freshwater exceeds the rate of evaporation, salinity is low.
- Salinity is not affected much in seas where both the supply of freshwater and evaporation of water is low.

4. Explain how temperature affects the following.

(a) the density of sea water

Answer:

- If temperature reduces, density of water increases.
- Hence, cold water is denser than hot water.

(b) the salinity of sea water

Answer:

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- If the salinity of water is high, the density of water increases.

Activity:

Complete the table showing the salinity of open and land-locked seas.

Evaporation of water			Supply of freshwater			
Region	Latitude	Solar Energy	Rainfall	River water	Snow water	Average salinity
Equatorial	0° to 15°	High	Perennial	High	-----	34‰
Tropical	15° to 35°	-----	Seasonal	-----	-----	37‰
Temperate	35° to 65°	Low	-----	-----	-----	33‰
Polar	65° to 90°	-----	-----	low	ample	31‰
Landlocked Sea		Solar Energy	Rainfall	River water	Snow water	Average salinity
Mediterranean Sea		High	low	low	-----	39‰
Red Sea		-----	-----	-----	-----	41‰
Baltic Sea		low	-----	Medium	-----	7‰
Dead Sea		-----	Very less	Very less	-----	332‰
Caspian Sea		-----	-----	-----	-----	155‰
Great Salt lake		medium	-----	-----	-----	220‰

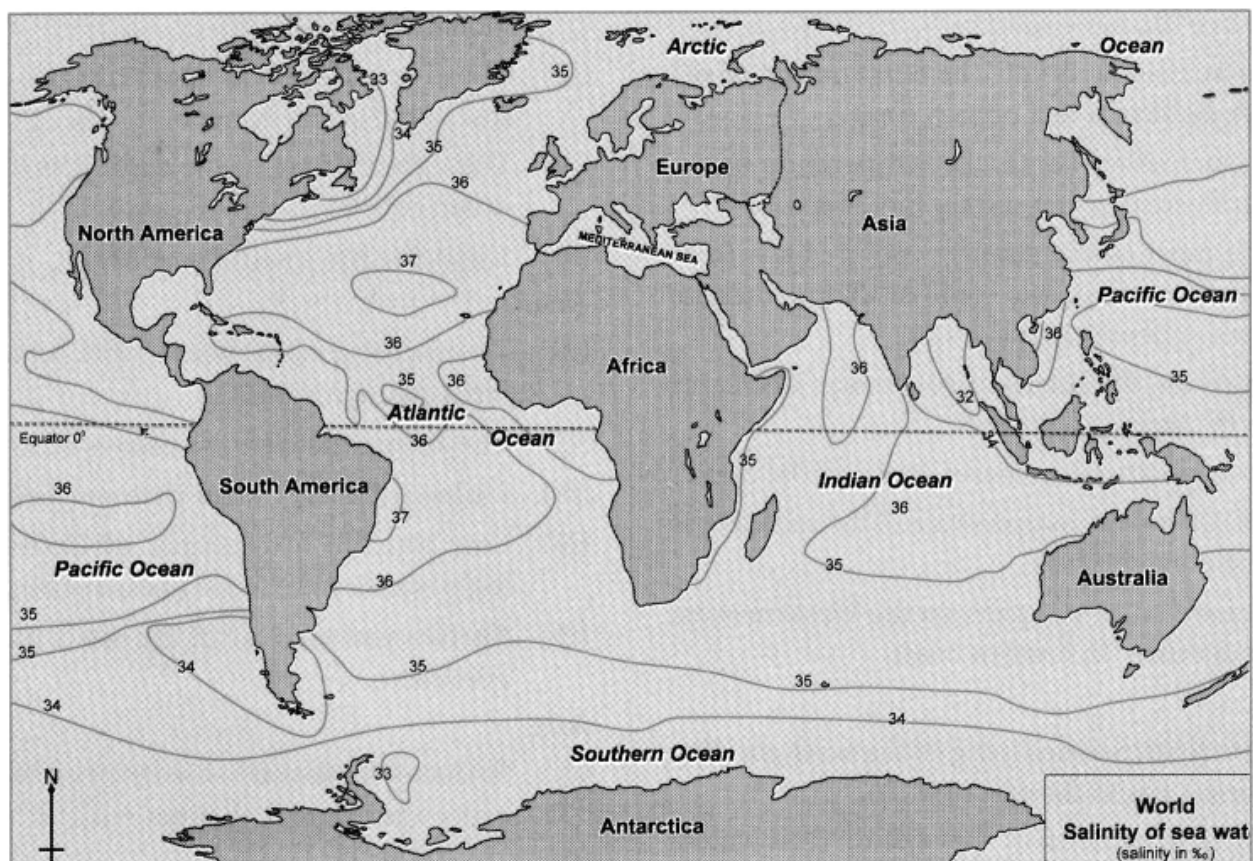
Answer:

Evaporation of Water			Supply of freshwater			
Region	Latitude	Solar Energy	Rainfall	River water	Snow water	Average salinity
Equatorial	0° C to 15° C	High	Perennial	High	-	34‰
Tropical	15° C to 35° C	<u>Medium</u>	Seasonal	<u>Low</u>	-	37‰
Temperate	35° C to 65° C	Low	<u>Seasonal</u>	<u>Medium</u>	-	33‰
Polar	65° C to 90° C	<u>Low</u>	<u>Seasonal</u>	<u>Low</u>	Ample	31‰
Landlocked sea	Solar Energy	Rainfall	River water	Snow water	Average salinity	
Mediterranean sea	High	Low	Low	-	39‰	
Red sea	<u>High</u>	<u>Low</u>	<u>Very Low</u>	-	41‰	
Baltic sea	Low	<u>Medium</u>	Medium	-	7‰	
Dead sea	<u>High</u>	Very less	Very less	-	332‰	
Caspian sea	<u>Medium</u>	<u>Low</u>	<u>Low</u>	-	155‰	
Great Salt lake	Medium	<u>Low</u>	<u>Low</u>	-	220‰	

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Questions and Answers

Observe the following Map and answer the questions:



Question 1.

What is the salinity around the tropics?

Answer:

The salinity around the tropics is 36‰.

Question 2.

Which region has the least salinity?

Answer:

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The Bay of Bengal has the least salinity of 32‰.

Question 3.

Which ocean has salinity more than 37‰?

Answer:

Atlantic ocean has salinity of more than 37‰.

Question 4.

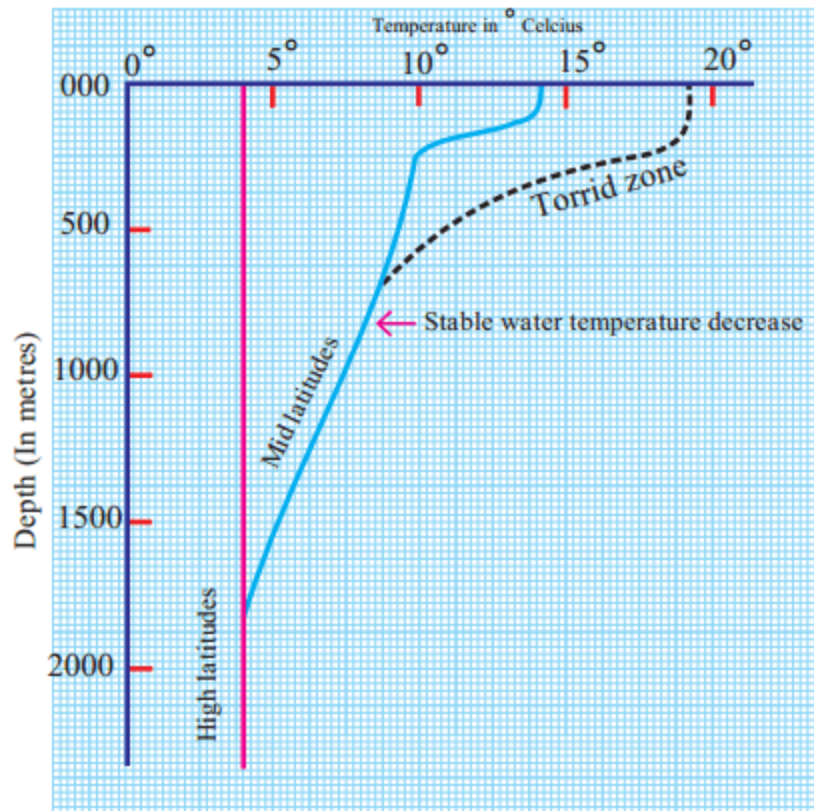
What are the reasons of differences in salinity on a global level?

Answer:

The uneven distribution of temperature on earth, and uneven supply of freshwater, etc. are the reasons for differences in salinity on a global level.

Observe the Graph and answer the questions:

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Depth and temperature of seawater

Question 1.

What is the maximum temperature of seawater in equatorial areas? How much is this temperature at a depth of 500 m?

Answer:

The maximum temperature of sea water in equatorial areas is 18° C. The temperature at the depth of 500 m is 11° C.

Question 2.

What is the temperature of seawater at the sea level in the mid-latitudes?

Answer:

The temperature of seawater at the sea level in the mid-latitudes is 14° C approximately.

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Question 3.

How much has this temperature changed at 1500 m depth?

Answer:

The temperature is about 5° C at the depth of 1500 m. Thus the temperature of sea water at mid-latitudes has changed from 14°C at the sea level to about 5°C at the depth of 1500 m i.e. temperature has changed (reduced) by 9°C.

Question 4.

What does the thermal graph for the high latitude say? What is its temperature at 500, 1000 and 1500 m depths?

Answer:

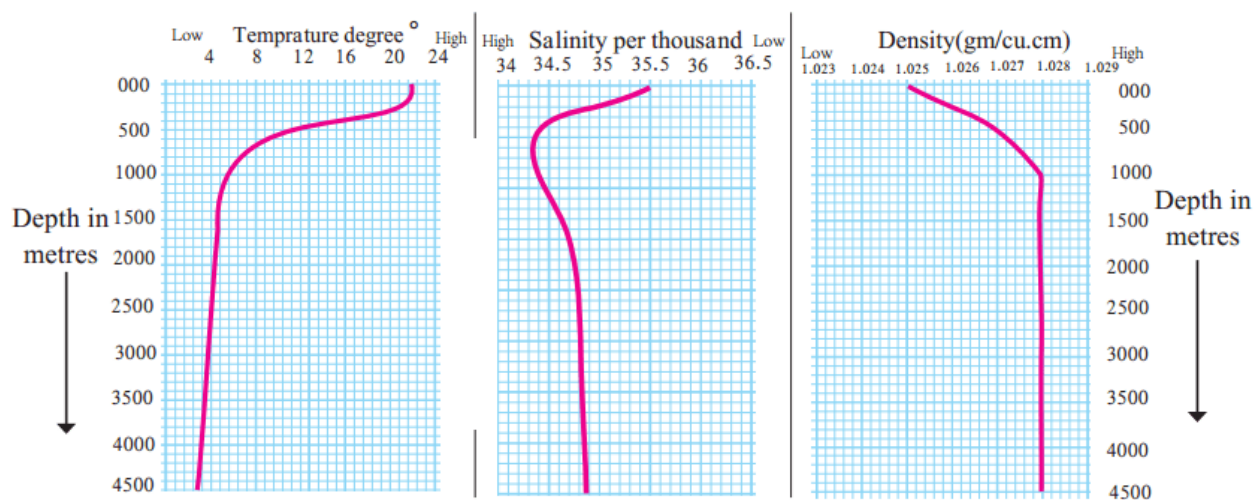
In high latitudes the temperature of sea water at all depths remains constant at 4° C.

Question 5.

After what depth does the seawater temperature remain stable everywhere?

Answer:

After 2000 m, the temperature of the sea water is uniform everywhere.



Distribution of temperature, salinity and density of seawater according to depth.

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Question 6.

With increasing depth, what decreases: temperature, salinity or density?

Answer:

Temperature and salinity decreases with increasing depth.

Question 7.

After what depth does the change in these factor become almost zero?

Answer:

After the depth of 1000 m there is no change in all these factors.

Question 8.

Till what depth is the change in these factors higher?

Answer:

The higher change can be seen up to a depth of about 500m.

Question 9.

Explain the correlation between all the three factors.

Answer:

If the temperature is less, density is more. If the salinity is less, then density is also less. However temperature affects the density more as compared to the salinity. If the temperature is less, then the density is more despite less salinity.

Let's Recall.

Question 1.

Which is the largest water storage of the world?

Answer:

Oceans are the largest water storage of the world.

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Question 2.

Why is the seawater salty?

Answer:

- Salt in the ocean comes from rocks on land.
- Rivers carry dissolved salts to the ocean.
- Water evaporates from the oceans to fall again as rain and to feed the rivers, but the salts remain in the ocean.

Question 3.

What are the reasons for high salinity in the oceans?

Answer:

High rate of evaporation and low supply of fresh water leads to high salinity in the oceans:

Question 4.

How can we obtain the salts from the ocean water?

Answer:

- Sea water contains a large amount of common salt and the salts of other metals dissolved in it.
- Near the sea-shore, the sea water is collected in shallow pits (salt pans) and allowed to evaporate in the sunshine.
- In a few days, the water evaporates, leaving behind salt.
- The salt so obtained is collected and transported to factories, where it is purified and packed for consumption.

Question 5.

What is the use of the salts in the oceans to us?

Answer:

- The salts is used in the food we eat.
- It is used for making various chemicals and medicines.
- Salt is also used to preserve things for longer periods. It is also used in ice factories.

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Can You Tell?

Question 1.

What is the difference in the temperatures of the land and the sea?

Answer:

During the daytime land is hotter than the sea whereas, during the night time land is cooler than the sea.

Question 2.

What would be the difference in the temperature of the seawater from the equatorial region to the polar areas?

Answer:

Latitudinally, the surface temperature of the seawater decreases from the equatorial areas towards the poles. The average temperature in equatorial areas is around 25°C while it is about 2°C near the poles.

Think about it.

Question 1.

If you think about India there is the Arabian sea to the west and the Bay of Bengal to the east. The salinity of the eastern coast is 34‰ while it is 35‰ in the Arabian sea. What could be the reason of higher salinity in the western coastal region?

Answer:

Many large peninsular rivers drain their waters in the Bay of Bengal and on the contrary only small seasonal coastal rivers drain in the Arabian sea. Hence the salinity of Arabian sea is more than the Bay of Bengal.

Try this.

Question 1.

In which container has the water increased or decreased?

Answer:

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- The water has increased in the container which is in the classroom in which freshwater was added.
- The water has decreased in the container which was kept in the sun outside.

Question 2.

What could be the reasons behind the decrease or increase?

Answer:

- Since freshwater was added to one of the containers in the classroom the water level increased.
- The water has decreased in the container which was kept outside in the sun due to evaporation.

Question 3.

What could be the reason behind the low and high salinity of the water in the container?

Answer:

- In the container which as kept outside in the sun, due to high rate of evaporation, the salinity is high.
- As we kept on adding fresh water to the container kept in the classroom the salinity is low.

Additional Important Questions and Answers

Select the correct option:

Question 1.

The average temperature in equatorial areas is

- (a) 25° C
- (b) 35° C
- (c) 15° C
- (d) 5° C

Answer:

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(a) 25°C

Question 2.

The average temperature in mid-latitudes is

(a) 25° C

(b) 10° C

(c) 16° C

(d) 5° C

Answer:

(c) 16°C

Question 3.

The average temperature near poles is about

(a) 10° C

(b) 20° C

(c) 15° C

(d) 2° C

Answer:

(d) 2°C

Question 4.

With the increasing depth of sea, the intensity of sunrays

(a) increases

(b) decreases

(c) remains constant

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(d) is uneven

Answer:

(b) decreases

Question 5.

Seawater upto the depth of 500m is called

(a) ground water

(b) surface water

(c) deep water

(d) saline water

Answer:

(b) surface water

Question 6.

ocean is the most saline ocean in the world.

(a) Pacific

(b) Arctic

(c) Indian

(d) Atlantic

Answer:

(d) Atlantic

Question 7.

The sea lying on the border of Israel and Jordan has a salinity of ‰.

(a) 37

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- (b) 50
- (c) 256
- (d) 332

Answer:

- (d) 332

Question 8.

The buoyancy of the sea water increases because of its

- (a) evaporation
- (b) salinity
- (c) density
- (d) high temperature

Answer:

- (b) salinity

Question 9.

has an altitude of – 400m.

- (a) Baltic Sea
- (b) Arabian Sea
- (c) Dead Sea
- (d) the Mediterranean Sea

Answer:

- (c) Dead sea

Question 10.

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act as temperature controllers at a global level.

- (a) Ocean currents
- (b) Sea breeze
- (c) Land breeze
- (d) Trade winds

Answer:

- (a) Ocean currents

Question 11.

is a major property of the sea water.

- (a) Temperature
- (b) Uniform salinity
- (c) Buoyancy
- (d) Equal Density

Answer:

- (a) Temperature

Question 12.

have higher salinity than open seas.

- (a) Equatorial seas
- (b) Landlocked seas
- (c) Freshwater lakes
- (d) Seas in polar regions

Answer:

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(b) landlocked seas

Question 13.

Temperature decreases upto depth.

- (a) 500 m
- (b) 1000 m
- (c) 1500 m
- (d) 2000 m

Answer:

- (d) 2000m

Question 14.

In regions where cold currents flow, the surface temperature of ocean water is

- (a) high
- (b) less
- (c) uniform
- (d) uneven

Answer:

- (b) less

Question 15.

Temperature of seawater changes rapidly with depth in areas.

- (a) equatorial
- (b) mid latitudinal
- (c) temperate

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(d) polar

Answer:

(a) equatorial

Question 16.

In seas where the rate of evaporation is than the supply of fresh water, salinity is high.

(a) less

(b) high

(c) same

(d) low

Answer:

(b) high

Question 17.

The salinity of Bay of Bengal is than that of Arabian sea.

(a) less

(b) more

(c) same

(d) equal

Answer:

(a) less

Question 18.

In areas the salinity of sea water is low.

(a) equatorial

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(b) mid-latitude

(c) temperate

(d) polar

Answer:

(d) polar

Question 19.

The salinity of Baltic sea is %.

(a) 33.2

(b) 32

(c) 37

(d) 7

Answer:

(d) 7

Match the Column:

Column A	Column B
(1) Equatorial areas	(a) Salinity of 33.2‰
(2) Mid-latitude areas	(b) Slanting sunrays, melting of snow
(3) Temperate regions	(c) Cloudy sky and convectional rainfall
	(d) Hot deserts

Answer:

(1-c),

(2- d),

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(3 – b)

Answer in one sentence:

Question 1.

What is the major property of seawater?

Answer:

Temperature is a major property of seawater.

Question 2.

What is the average surface temperature of seawater in equatorial areas, mid-latitudes & poles?

Answer:

The average surface temperature of seawater in equatorial areas is around 25°C in mid-latitude it is around 16°C & 2°C near the poles.

Question 3.

After what depth is the seawater temperature uniform everywhere?

Answer:

After 2000m, the temperature of seawater is uniform everywhere

Question 4.

Name the instruments used to measure salinity?

Answer:

Hydrometer, Refractometer and salinometer are used to measure salinity.

Question 5.

Which is the most saline ocean?

Answer:

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The Atlantic ocean is the most saline ocean.

Give geographical reasons:

Question 1.

The climate of the earth gets affected by ocean currents.

Answer:

- The ocean currents are generated because of the difference in the properties of seawater.
- They act as temperature controllers at the global level.
- The distribution of temperature gets controlled due to the ocean currents.
- Thus, the climate of the earth gets affected by ocean currents.

Question 2.

Dead Sea has a salinity of 332‰.

Answer:

- The sea lying on the border of Israel and Jordan has a salinity of 332‰.
- The average salinity of ocean is 35‰.
- Jordan is the only large river meeting this sea.
- Low rainfall, low supply of freshwater and high evaporation is the reason of high salinity.

Question 3.

The surface temperature of the sea is not uniform everywhere.

Answer:

- The surface temperature of sea water is not uniform everywhere and it changes with latitudes.
- The surface temperature of the seawater decreases from the equatorial areas towards the poles.
- The average temperature in equatorial areas is around 25° C, it is 16° C in mid-latitudes while it is about 2° C near the poles.
- Besides this, cyclones, rainfall, sea waves, ocean currents, salinity, pollution, convergence flow, seasons, etc. also affect the surface temperature.
- Thus the surface temperature of the sea is not uniform everywhere.

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Question 4.

The seas in equatorial calm belt are more saline.

Answer:

- Around 5° N and S of the equator, in the equatorial calm belt, the sky is cloudy for a long period of time and convectional rainfall occurs every day.
- Large rivers like Congo and Amazon in the equatorial regions meet the sea.
- Therefore, supply of freshwater abundant too.
- But because of higher temperatures, rate of evaporation is more and therefore, the seas in these areas are more saline.

Explain

Question 1.

Factors affecting surface water temperature

Answer:

- Temperature is a major property of the seawater. The surface temperature of the seawater is not uniform everywhere. This is dependent on different factors.
- Latitudinally, the surface temperature of the seawater decreases from the equatorial areas towards the poles.
- Besides this, cyclones, rainfall, sea waves, ocean currents, salinity, pollution, convergence flow and seasons also affect the surface temperature.
- Regions where cold ocean currents flow, the surface temperature of ocean water is less. The regions where the warm currents move, the temperature increase.

Question 2.

Density of sea water

Answer:

- Temperature and salinity are the two properties of sea water that control the density of the sea water.
- If temperature reduces, density of water increases.
- Cold water is denser, and so is saline water.
- As compared to salinity, temperature affects the density more. Hence, sometimes, more saline water has lower temperature at the surface.

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- Sea water having higher temperature and low salinity, can have lower density.

Question 3.

Measurement of salinity of sea water.

Answer:

- The weight of all dissolved salts in water in ratio of parts per thousand of water is called the salinity of seawater.
- For example, if the weight of dissolved salts in 1000g (1 kg) of seawater is 40g, then the salinity is 40‰ i.e. 40 per thousand parts.
- Hydrometer, refractometer and salinometer are also used to measure salinity.

Question 4.

Factors affecting salinity of sea water.

Answer:

Latitudes	Temperature / Rate of evaporation	Supply of fresh water	Salinity
Tropical Zone 5°N – 5°S of equator	High	Abundant from (River Congo / Amazon)	High
Midlatitudes (25° – 35° N and S)	High (hot desert are found here)	low	High
Temperate regions	Temperature is lower due to slanting sunrays	The supply of water is more due to melting snow	low
Polar regions	Very low	low	low

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Maharashtra Board Solutions

Class 9 Geography

- Chapter 1- Distributional Maps
- Chapter 2- Endogenetic Movements
- Chapter 3- Exogenetic Movements Part 1
- Chapter 4- Exogenetic Movements Part 2
- Chapter 5- Precipitation
- Chapter 6- Properties of Sea Water
- Chapter 7- International Date Line
- Chapter 8- Introduction to Economics
- Chapter 9- Trade
- Chapter 10- Urbanisation Human
- Chapter 11- Transport and Communication
- Chapter 12- Tourism

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About About Maharashtra State Board (MSBSHSE)

The Maharashtra State Board of Secondary and Higher Secondary Education or MSBSHSE (Marathi: महाराष्ट्र राज्य माध्यमिक आणि उच्च माध्यमिक शिक्षण मंडळ), is an **autonomous and statutory body established in 1965**. The board was amended in the year 1977 under the provisions of the Maharashtra Act No. 41 of 1965.

The Maharashtra State Board of Secondary & Higher Secondary Education (MSBSHSE), Pune is an independent body of the Maharashtra Government. There are more than 1.4 million students that appear in the examination every year. The Maha State Board conducts the board examination twice a year. This board conducts the examination for SSC and HSC.

The Maharashtra government established the Maharashtra State Bureau of Textbook Production and Curriculum Research, also commonly referred to as Ebalbharati, in 1967 to take up the responsibility of providing quality textbooks to students from all classes studying under the Maharashtra State Board. MSBHSE prepares and updates the curriculum to provide holistic development for students. It is designed to tackle the difficulty in understanding the concepts with simple language with simple illustrations. Every year around 10 lakh students are enrolled in schools that are affiliated with the Maharashtra State Board.

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FAQs

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As of now, the MSCERT and Balbharti are responsible for the syllabus and textbooks of Classes 1 to 8, while Classes 9 and 10 are under the Maharashtra State Board of Secondary and Higher Secondary Education (MSBSHSE).

How many state boards are there in Maharashtra?

The Maharashtra State Board of Secondary & Higher Secondary Education, conducts the HSC and SSC Examinations in the state of Maharashtra through its nine Divisional Boards located at Pune, Mumbai, Aurangabad, Nasik, Kolhapur, Amravati, Latur, Nagpur and Ratnagiri.

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