Properties of Sea Water

Exercise

Q. 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. Slanting sunrays, melting snow.

Answer: Low.

B. Cloudy sky, rainfall throughout the year

Answer: Low.

C. Clear skies for the most part, perpendicular sunrays

Answer: High

D. Less supply of freshwater, desert area around

Answer: High.

E. Low temperatures, ample supply of river water

Answer: Low.

F. Continental location, desert around, low rainfall

Answer: High.

Q. 2 A. Give reason.

Salinity is low in the land-locked Baltic Sea.

Answer : Salinity is low in the land locked Baltic Sea because of the high temperature. The fresh water from the surrounding land gets run off and the salt density is also low. The Baltic Sea is almost land-locked and covers an area of “122415 000 km”. The volume of water is only “21 000 km” because it is shallow.

Q. 2 B. Give reason.

There is higher salinity in the northern Red Sea while lower in the southern. The northern part mainly has the Gulf of Suez water which lies to the west of the Sinai Peninsula. The water from the Gulf of Suez has a salinity of about 40 parts per thousand, owing in part to evaporation, and consequently a high density.

Answer : The Red Sea, is a seawater inlet of the Indian Ocean, lying between Africa and Asia. It is one of the saltiest bodies of water in the world, owing to high evaporation.

Q. 2 C. Give reason.

Oceans located at the same latitude do not have same salinity.

Answer : The distribution of dissolved salts in the oceans and adjacent seas varies in space and time. Salinity is changed near the sea surface by precipitation and evaporation of fresh water and by salty water produced sea ice forms and excludes salt. Geographical variations in inputs create regional differences in salinity at the sea surface. As seawater circulates down into the ocean away from the sea surface, it carries these differences along, creating large-scale salinity patterns throughout the ocean. Changes in time in the inputs at the sea surface also affect the salinity distribution.

Q. 2 D. Give reason.

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

Answer : Because at the depth of sea water sun lights can't reach so that temp of sea decreases to a certain limit with increasing its depth. So the bottom ones remains cool as compared to top one) the water at the bottom has least velocity or negligible as compared to the top ones.

Q. 2 E. Give reason.

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

Answer : West coast is coast of submergence while east coast is an emergent coast. These imply that sea is deeper in west coast than sea on east coast. So, west coast has favourable conditions for natural harbours. West Rivers form estuaries and eastern rivers form delta. Therefore it becomes difficult for ships to reach the east coast covered with sediments. High Tides hit coast real hard. So coastal erosion, natural ports, because of these conditions there are more salt-pans on the Western coast of India than its eastern coast.

Q. 2 F. Give reason.

Salinity increases in the midlatitudinal zones.

Answer : Sea water is about a 3.49% salt solution, the rest is freshwater. The more saline, the denser the seawater. As the range of salt concentration in the ocean varies from about 3.2 to 3.8% it is referred to salt content as 'salinity', express salt concentration as parts per thousand; 34.9 ppt is the average salinity. As seawater evaporates the salt remains behind, only the freshwater is transferred from the ocean to the atmosphere. A region of excess evaporation, such as the subtropics tends to become salty, while the areas of excess rainfall become fresher. Sea ice formation also removes freshwater from the ocean, leaving behind a more saline solution. And hence Salinity increases in the midlatitudinal zones.

Q. 3. Answer the following questions.

A) What are the factors affecting the salinity of the sea water?
B) Explain the distribution of salinity around the Tropic of Cancer and tropic of Capricorn.
C) What are the factors affecting the temperature of the sea water?
D) Explain the changes occurring in the temperature of sea water according to the depth.
E) Name the factors affecting salinity.

Answer : A) Evaporation of ocean water and formation of sea ice both increase the salinity of the ocean these are the are the factors affecting the salinity of the sea water.

B) The Tropic of Cancer is the circle marking the latitude 23.5 degrees north, where the sun is directly overhead at noon on June 21, the beginning of summer in the northern hemisphere. The Tropic of Capricorn is the circle marking the latitude 23.5 degrees south where the sun is directly overhead at noon on December 21, the beginning of winter in the northern hemisphere. Ocean salinity is on average 35 ppt, but can range anywhere from 33-38 ppt depending on the processes affecting it (like precipitation and evaporation). Surface salinity can even reach as high as 40 ppt in areas like the Red Sea, which is in a high evaporation latitude.

C) The salinity of water in surface layer of oceans mainly depend on evaporation and precipitation and transportation of rain water in the cycle of water.**D)** As we go down in

the sea, the intensity of sunlight will decrease due to scattering and hence the temperature will increase with the depth.

E) The salinity of water in the surface layer of oceans depend mainly on evaporation and precipitation.

Q. 4 A. Explain how temperature affects the following.

the density of sea water

Answer : Sea water gets more dense as temperature goes down. So, the colder the water, the more dense it is. Increasing salinity also increases the density of sea water. Less dense water floats on top of more dense water. Near the freezing point, water expands when it heats up. Seawater too. So increasing temperature decrease the density of seawater.

Q. 4 B. Explain how temperature affects the following.

the salinity of sea water

Answer : Salinity Affects Density. When salt is dissolved in fresh water, the density of the water increases because the mass of the water increases. The more salt there is dissolved in the water, the greater its salinity. Temp causes water to rise or sink through convection, and salinity affects the density of the water, so higher salinity water will contribute to deep water currents Density is affected by temperature and salinity. Cold water or water with dissolved salts (higher salinity) is denser than warm water or water without dissolved salts (low or no salinity).

Activity

Q. 1. 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			
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Dead Sea		Very High	Very less	Very less	Less	332‰
Caspian Sea		High	Less	Less	Less	155‰
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