

**Oceanography Section 5-6 and 5-7 Questions****Multiple Choice**

Identify the choice that best completes the statement or answers the question.

- \_\_\_\_\_ 1. The saturation value for gas
- Is a relative amount that depends on temperature, salinity, and pressure.
  - Would decline as water evaporated because there would be less water to dissolve gas.
  - Is exceeded when water is undersaturated.
  - Is exceeded when salinity decreases.
  - Is exceeded as water cools.
- \_\_\_\_\_ 2. The oxygen minimum layer exists at the depth at which it does because
- Surface water is in direct contact with the atmosphere and the deep water has abundant plants producing oxygen.
  - The deep water originates as cold oxygen-rich surface water and there are fewer organisms and less decomposition in the deep water compared with the oxygen minimum layer.
  - The pycnocline allows oxygen to enter easily.
  - No organic material can sink below the pycnocline.
  - Higher salinity and temperature of the pycnocline means oxygen has a higher saturation value in the deep ocean.
- \_\_\_\_\_ 3. The pH of ocean water
- Is buffered by the presence of CO<sub>2</sub>.
  - Decreases as the abundance of CO<sub>2</sub> increases.
  - Is lower in the deep ocean than the surface.
  - Can be altered by photosynthesis and respiration.
  - All of the above
- \_\_\_\_\_ 4. Ocean water
- Occupies 80% of the Northern Hemisphere and 60% of the Southern Hemisphere.
  - Represents 79% of all the water on Earth.
  - Is constantly recycled among the land, ocean, and atmosphere.
  - Is second in abundance to groundwater.
  - All of the above.
- \_\_\_\_\_ 5. In obtaining seawater samples from great depths,
- The sampling container must be made of an inert material.
  - Depth can be obtained by measuring the length of the cable to the sample container.
  - Samples must be recovered quickly before thermometers readjust for temperatures at shallower depths.
  - The same messenger triggers all the sample bottles on the cable.
  - All of the above
- \_\_\_\_\_ 6. All the following are methods of desalinization *except*
- Distillation and condensation.
  - Reverse osmosis.
  - Electrodialysis.
  - Freezing.
  - Dilution of salt water with fresh.

- \_\_\_\_\_ 7. Sea ice
- Begins as needles and can eventually grow into icebergs.
  - Can form pancake ice.
  - Is pure water containing no salts within the ice mass.
  - Forms pressure ridges where icebergs collide.
  - All of the above.
- \_\_\_\_\_ 8. Light in the ocean
- Penetrates to the bottom of the deep ocean.
  - Is selectively absorbed by the water, with the red light penetrating the deepest.
  - Can only travel downward to the bottom.
  - Cannot exist in the aphotic zone.
  - Is mostly absorbed and converted to heat within the first meter of depth.
- \_\_\_\_\_ 9. The speed of sound in the ocean
- Increases as salinity and pressure increase and as temperature decreases.
  - Initially decreases, then increases, and finally decreases with depth.
  - Is fairly uniform throughout the ocean.
  - Is at a maximum in the SOFAR channel.
  - Has a shallow maximum speed and deeper minimum speed.
- \_\_\_\_\_ 10. The sea surface microlayer
- Is devoid of life.
  - Extends to a depth of several centimeters.
  - Is highly distorted as bubbles pass through.
  - Is in the aphotic zone.
  - All of the above

### Completion

Complete each statement.

11. The maximum amount of gas that can remain in equilibrium dissolved in water is called the \_\_\_\_\_ and it is controlled by three factors. The maximum amount of gas increases as the \_\_\_\_\_ and \_\_\_\_\_ decrease and the \_\_\_\_\_ increases. If less than the maximum amount of gas is present, the water is said to be \_\_\_\_\_. If the maximum amount of gas is present, the water is said to be \_\_\_\_\_ and if more than the maximum amount is present it is said to be \_\_\_\_\_.
12. The area coinciding with the pycnocline where dissolved oxygen can become scarce because of over-consumption is called the \_\_\_\_\_. If oxygen is absent, the environment is said to be \_\_\_\_\_ and the organisms that live there are called \_\_\_\_\_.
13. The measure of hydrogen ion abundance in water is called \_\_\_\_\_ and varies from 0 to 14. From 0 to almost 7 indicates the solution is \_\_\_\_\_. From slightly greater than 7 to 14 indicates it is \_\_\_\_\_, and at 7 the solution is \_\_\_\_\_. Above 7 indicates that there are more \_\_\_\_\_ ions than hydrogen ions in water. Carbon dioxide in water acts as a \_\_\_\_\_ because it prevents extreme and rapid change in the amount of hydrogen ions. If an acid is mixed with a base, the two react to form \_\_\_\_\_.
14. Give the name for each of the following:  $H^+$  is \_\_\_\_\_,  $OH^-$  is \_\_\_\_\_,  $H_2CO_3$  is \_\_\_\_\_,  $HCO_3^-$  is \_\_\_\_\_, and  $CO_3^{2-}$  is \_\_\_\_\_.

15. Organisms that inhabit the neuston layer with their bodies protruding into the air above are called \_\_\_\_\_. An example of such an organism is the \_\_\_\_\_. This organism moves about using power from the \_\_\_\_\_ by extending a(n) \_\_\_\_\_ above the surface of the water.
16. A commonly used device for obtaining deep seawater samples in the \_\_\_\_\_. Normally, a special type of thermometer, called a \_\_\_\_\_, is attached to the sampling device and when inverted it records the temperature and is not altered by subsequent temperature changes.
17. Production of fresh water from salt water is called \_\_\_\_\_.
18. As ice forms from seawater, only the water freezes into ice. The \_\_\_\_\_ is excluded. Gradually large sheets of ice called \_\_\_\_\_ form. These float freely and collide, raising \_\_\_\_\_ along their edges. Masses of moving sea ice are referred to as a(n) \_\_\_\_\_. In contrast, \_\_\_\_\_ originate on land as parts of glaciers and become detached in the sea.
19. As light passes through water, various wavelengths are selectively removed in a process called \_\_\_\_\_. In the open ocean, the color that is removed the fastest is \_\_\_\_\_ and the color that penetrates the deepest is \_\_\_\_\_. In contrast, in coastal waters \_\_\_\_\_ removes light faster and light rarely penetrates deeper than \_\_\_\_\_ m. The portion of the ocean that is penetrated by light is called the \_\_\_\_\_ and the part where it is permanently dark is called the \_\_\_\_\_.
20. Three factors control the speed of sound in the sea. Sound velocity increases as \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ increase. As one descends in the water column, sound velocity initially increases because \_\_\_\_\_ increases. In the pycnocline, sound velocity decreases because \_\_\_\_\_ decreases. Below the pycnocline sound velocity again increases because \_\_\_\_\_ increases. The \_\_\_\_\_ coincides with the area of minimum sound velocity. Here, sound waves are continuously \_\_\_\_\_, preventing dispersion of the sound waves. Some sound generated here can be heard thousands of kilometers away.
21. The very surface of the ocean is called the \_\_\_\_\_. As a habitat, it is called the \_\_\_\_\_, and a general name for the organisms who live here is the \_\_\_\_\_.