

Weekly Homework
7th Week

الإدارة المركزية للتعليم العام
إدارة تنمية مادة العلوم



2026

Integrated Sciences

1st Secondary
First Term

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Ch (1): Lesson (7) Effect of Atmospheric Air Gases on Aquatic Environments**Question (1) Choose the correct answer:-**

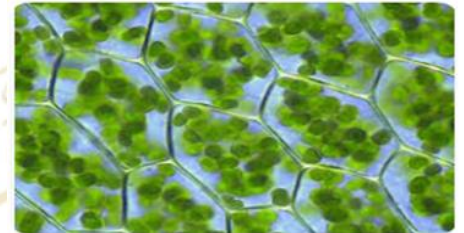
1 - What is the main factor that affects the amount of dissolved oxygen in water?

- A. Salinity
- B. Temperature
- C. Depth of water
- D. Wave movement



2- The photosynthesis process of aquatic producers is a source of

- A. Increased carbon dioxide in water
- B. Increased oxygen in water
- C. Decreased water temperature
- D. Increased salinity of water



3-. When water temperature rises, the solubility of oxygen gas:

- A. Increases
- B. Decreases
- C. Is not affected
- D. Doubles

4- Which of the following gases forms carbonic acid when dissolved in water?

- A. Oxygen (O_2)
- B. Nitrogen (N_2)
- C. Carbon dioxide (CO_2)
- D. Hydrogen (H_2)

5- Marine organisms such as corals and mollusks depend on calcium carbonate to build their

- A. Internal skeletons
- B. Shells and exoskeletons
- C. Gills
- D. Fins



6- What phenomenon describes the movement of gases from a high concentration region to a low concentration region?

- A. Osmosis
- B. Diffusion
- C. Photosynthesis
- D. Respiration

7-. Which of the following human activities directly contributes to increasing carbon dioxide levels in water bodies?



- | | |
|------------------|-------------------------|
| A. Overfishing | B. Industrial pollution |
| C. Building dams | D. Coastal tourism |

8- The relationship between water temperature and the solubility of carbon dioxide is:

- | | |
|-------------|--------------------|
| A. Direct | B. Inverse |
| C. Constant | D. No relationship |

9- In marine organisms, the symbol CaCO_3 represents:



- A. Carbonic acid
- B. Calcium bicarbonate
- C. Calcium carbonate
- D. Calcium oxide

10-. The atmosphere is the main source of which gas dissolved in water?

- A. Sulfur dioxide
- B. Oxygen
- C. Methane
- D. Argon

11- In an artificial lake, a massive fish kill was observed on a very hot sunny day. What is the most likely scientific explanation?



- A. A large increase in photosynthesis caused water toxicity
- B. A sharp decrease in dissolved oxygen due to high temperature
- C. A high decrease in pH of water
- D. An increase in salinity due to evaporation

12-If a large amount of algae is planted in a fish pond, how will the concentration of dissolved oxygen change over 24 hours (day and night) ?

- A. Remains constant
- B. Increases during the day and decreases at night
- C. Decreases during the day and increases at night
- D. Continuously increases



13-Some coral reefs suffer from the phenomenon known as “bleaching,” which is related to the increase in ocean acidity. What is the direct cause of this phenomenon?



- A. Decrease in dissolved oxygen**
- B. Increased dissolution of CO_2 forming carbonic acid**
- C. Direct rise in water temperature**
- D. Pollution by heavy metals**

14- In an experiment, tap water was boiled and then cooled, Fish placed in it died. This is due to:

- A. Change in water pH**
- B. Loss of essential mineral salts**
- C. Expulsion of dissolved gases, especially oxygen, during boiling**
- D. Formation of toxic compounds due to heat**

15-. How can a factory dumping organic waste into a river affect dissolved oxygen concentration?

- A. Waste increases water temperature, which decreases oxygen levels**
- B. Waste directly consumes oxygen through chemical reactions**
- C. Waste promotes bacterial growth that consumes oxygen during decomposition**
- D. Waste prevents sunlight from reaching the water, which reduces photosynthesis and oxygen production**

16 - In cold regions, water is richer in dissolved oxygen compared to tropical warm regions. What is the biological result of this difference?



- A. Marine organisms in cold regions are smaller in size.**
- B. Biodiversity is higher in cold regions.**
- C. Cold regions support larger and more active marine life**
- D. There is no significant biological difference.**

17-. Which of the following best describes the dual effect of increasing carbon dioxide in water on organisms with calcareous structures?

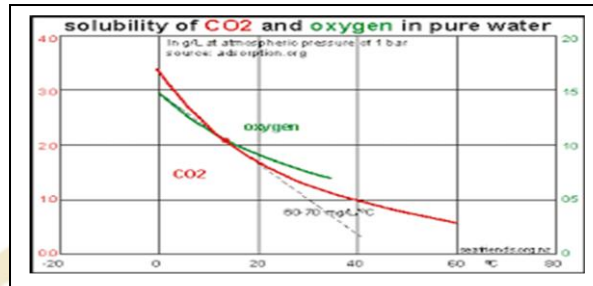
- A. It facilitates respiration and strengthens their skeletons.**
- B. It increases water acidity, hindering shell formation but providing more carbon for photosynthesis.**
- C. It lowers water acidity, dissolving shells and reducing available oxygen.**
- D. It increases pH, making shell formation easier.**

18-. Why are wave and wind movements important for aquatic life?

- A. They increase water depth.**
- B. They increase the surface temperature of water.**
- C. They enhance gas exchange between the atmosphere and water, increasing dissolved oxygen.**
- D. They prevent harmful algae growth.**



19- In the graph showing the relationship between temperature and the solubility of oxygen (O_2) and carbon dioxide (CO_2), which statement is correct?



- A. The solubility of both gases increases with temperature.
- B. The solubility of both gases decreases with temperature.
- C. O_2 solubility decreases while CO_2 solubility increases with temperature.
- D. O_2 solubility increases while CO_2 solubility decreases with temperature

20- When comparing a deep lake and a shallow lake in the same area, which one is expected to have greater daily variation in surface oxygen concentration?



- A. The deep lake, due to more water layers.
- B. The shallow lake, because temperature and photosynthesis affect a smaller volume of water.
- C. There is no difference between them.
- D. It depends on the type of fish in each lake.

21-A dense fish farm was established in a closed pond. Which of the following measures is most important for maintaining fish survival?

- A. Adding aquatic plants in abundance to increase oxygen.
- B. Installing aeration pumps (air pumps) to increase dissolved oxygen mechanically.
- C. Heating the water to speed up fish growth.
- D. Covering the pond to prevent evaporation.



22-“An increase in CO_2 in the atmosphere may benefit aquatic plants but can be catastrophic for shellfish.” Analyze this statement.

- A. Completely incorrect.
- B. Correct; plants use CO_2 for photosynthesis, while increased acidity dissolves shells of other organisms.
- C. Partly correct; plants benefit while shellfish are not affected.
- D. Reversed; plants are harmed while shellfish benefit.

23- In a balanced aquatic ecosystem, how do CO_2 levels change between day and night?

- A. Increase during the day due to animal respiration.
- B. Decrease during the day (used in photosynthesis) and increase at night (due to respiration).
- C. Remain constant due to chemical equilibrium of water.
- D. Continuously decreases throughout the day.

24- If we have two identical water tanks — one with fresh water and one with salt water at the same temperature, both aerated equally — in which tank will dissolved oxygen be higher?

- A. In salt water, because salt promotes oxygen solubility.
- B. In fresh water, because gas solubility decreases with increasing salinity.
- C. Equal concentration in both tanks.
- D. Cannot be determined without knowing air pressure.

25- Some fish, like salmon, migrate to cold, oxygen-rich river sources to lay its eggs. Why?



- A. To avoid predators in warmer waters.
- B. Because cold water provides higher dissolved oxygen levels essential for developing young fish.
- C. Because food is more abundant in those regions.
- D. Because water salinity is lower in river sources.

Essay Questions

1-. Define the concept of “gas solubility in water” and mention two main factors that affect it.

2- Briefly explain how both photosynthesis and respiration of aquatic organisms affect the concentration of dissolved oxygen in water.



3- Describe the relationship between water temperature and the amount of dissolved oxygen. Why is this relationship important for fish?



4- Explain why marine organisms that build shells and skeletons (such as oysters and corals) need an aquatic environment that is not highly acidic. Relate your answer to the increase in carbon dioxide in the atmosphere.



5- Imagine a closed aquatic ecosystem in a glass tank containing plants and fish. Describe how oxygen and carbon dioxide levels change over 24 hours, and explain the reasons.



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Model (A)

1) A 70 mg of a gas dissolves in a solvent to form a 2 L homogeneous solution at a specific temperature and pressure. So, the solubility is equal to.....

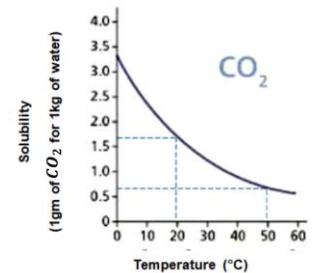
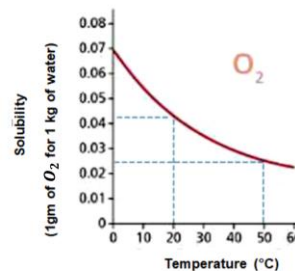
- (A) 70 mg/L
- (B) 140 mg/L
- (C) 35 mg/L
- (D) 17.5 mg/L

2) All of the following are sources of water-soluble carbon dioxide except

- (A) ☐ Atmosphere
- (B) ☐ Sea creatures
- (C) ☐ Decomposition of organic matter
- (D) ☐ Photosynthesis

3) Analyze the two graphs shown
From the figures, through the temperature range (20°C – 50°C), it is clear that by increasing the temperature, the:

- (A) ☐ O₂ solubility decreases at a greater rate than CO₂ solubility.
- (B) ☐ The solubility of CO₂ decreases at a greater rate the solubility of O₂.
- (C) ☐ The solubility of both O₂, CO₂ decreases at the same rate.
- (D) ☐ The solubility of O₂, CO₂ is increasing at the same rate.



4) Increasing the percentage of CO₂ in the water works on:

- (A) ☐ Increase acidification, increase calcification
- (B) ☐ Increase acidification, reduce calcification
- (C) ☐ Reduce acidification, increase calcification
- (D) ☐ Reduce acidification, reduce calcification

Essay Question

5- How can a factory dumping organic waste into a river affect dissolved oxygen concentration?

Model (B)

1) The mass of a gas that should be dissolved to a cup of pure water to form solution of volume 0.25 L, so that the solubility is 35 mg/L is equal to....

- (A) ☐ 8.75 mg
(B) ☐ 17.5 mg
(C) ☐ 25 mg
(D) ☐ 70 mg

2) The main source of both oxygen and carbon dioxide dissolved in water

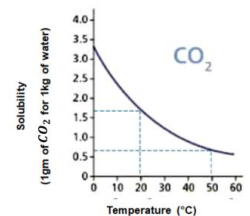
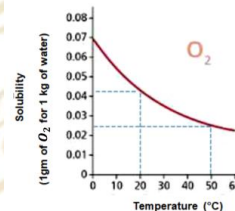
- (A) ☐ Photosynthesis.
(B) ☐ Respiration
(C) ☐ Atmosphere
(D) ☐ Hydrosphere

3) Which of the following causes a low pH of water?

- (A) ☐ Increased O_2
(B) ☐ Increased CO_2
(C) ☐ Decreased O_2
(D) ☐ Decreased CO_2

4) from the opposite figure:
when increasing the temperature,

	Solubility of O_2	Solubility of CO_2
A	Decreases	Increases
B	Increases	Decreases
C	Decreases	Decreases
D	Increases	Increases



Essay Question

5. Does the decrease in the calcification in some aquatic organisms result from an increase in carbon dioxide in the water or from a decrease in it? Explain.

Model (C)

1) The volume of the resulted solution at dissolving 60 mg of a gas in pure water, so that the solubility is 40 mg/L is equal to....

- (A) ☐ 0.7 L
(B) ☐ 1 L
(C) ☐ 1.5 L
(D) ☐ 20 L

2) Increasing the percentage of CO₂ gas in water works to convert

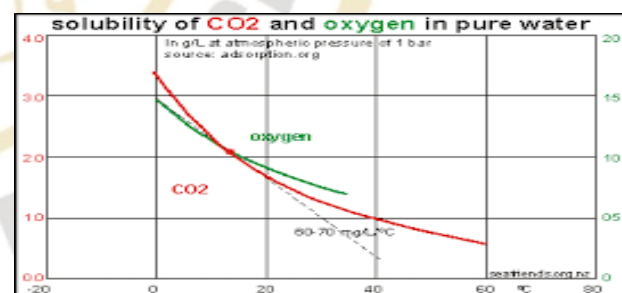
- (A) ☐ Calcium carbonate insoluble in water to calcium bicarbonate soluble in water.
(B) ☐ Calcium carbonate soluble in water to calcium bicarbonate insoluble in water.
(C) ☐ Calcium bicarbonate insoluble in water to calcium carbonate soluble in water.
(D) ☐ Calcium bicarbonate soluble in water to calcium carbonate insoluble in water.

3) What happens to the pH value at.....?

	increasing of O ₂ in water	increasing of CO ₂ in water
A	Doesn't change	Increases
B	Doesn't change	Decreases
C	Increases	Doesn't change
D	Decreases	Doesn't change

4) In the graph showing the relationship between temperature and the solubility of oxygen (O₂) and carbon dioxide (CO₂), which statement is correct?

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B. The solubility of both gases decreases with temperature.
C. O₂ solubility decreases while CO₂ solubility increases with temperature.
D. O₂ solubility increases while CO₂ solubility decreases with temperature



Essay Question

5) When studying an aquatic environment, an increase in swimming, hunting, and breeding activity is observed. Name one factor that leads to this?

