Ministry of Education and Technical Education
Central Administration for General Education
Science Consultant office





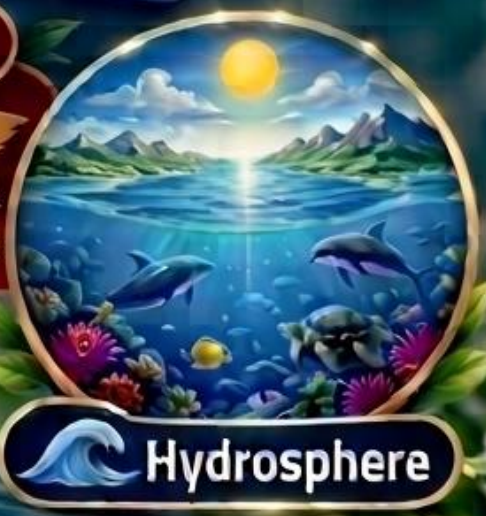
INTEGRATED SCIENCE

2026/2027

First Academic Term

1st Year of Secondary stage





Review

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Preparation

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أ/ عمرو مالي احمد

رئيس الإدارة المركزية التعليم العام
والمشرف على مستشاري المواد الدراسية
د/ هالة عبد السلام خفاجي

مستشار العلوم
د/ عزيزة رجب خليفة

Homework

First: Choose the correct answer

1) Which of the following expresses the correct definition of "ecological balance" in aquatic ecosystems according your studied? 1 mark

A) A state of static stability that occurs when predators are completely absent from the ecosystem.
B) A state of dynamic stability that occurs when living organisms interact with non-living components in a way that preserves the continuity of life.
C) The excessive increase in Nitrogen and Phosphorus levels to increase the productivity of marine Algae.
D) The process of energy flowing directly from predatory fish to growing plants and algae.

2) What are the organisms that represent the first base of the food web and from which the process of energy flow begins in the aquatic ecosystem? 1 mark

A) Herbivorous fish that feed on waste.
B) Zooplankton, which are consumed by small fish.
C) Producers such as Algae and Plants that carry out photosynthesis.
D) Large predatory fish that maintain the balance of prey numbers.

3) An imbalance in the levels of Nitrogen and P|hosphorus, and their excessive increase in lakes, leads to …….. 1 mark

A) A sharp and direct decrease in the numbers of growing small fish.
B) An abnormal bloom of Algae that negatively affects the ecological balance.
C) An increase in the photosynthetic efficiency of deep coral reefs.
D) The transformation of consumers into energy-producing organisms.

4) If a company discharges polluted water containing pesticides and heavy metals into a waterway, what is the expected direct effect on this ecosystem according your studied? **2 marks**

A) Improved water quality as a result of metals reacting with dissolved oxygen.
B) A negative effect on water quality and direct harm to the health of living organisms.
C) An increase in the migration rates of salmon to lay their eggs in rivers.
D) The complete disappearance of sea urchins and the protection of coral reefs from destruction.

5) In a marine environment, if large predatory fish are subjected to overfishing that sharply reduces their numbers, what is the expected sequence of events? **2 marks**

A) The number of small fish decreases because they have no protection.
B) The number of small fish increases excessively, leading to an unbalanced consumption of food resources and a disturbance of the ecosystem.
C) Small fish switch to self-feeding through photosynthesis.
D) Energy transfer reverses direction, from consumers to aquatic producers.

6) A factory applied the concept of "sustainable development" by introducing clean technology that recycles water and prevents industrial waste. What is the main aim of this measure, as stated in the textbook? **2 marks**

A) To meet the needs of the current generation without compromising the ability of future generations to meet their own needs.
B) To rapidly increase the numbers of endangered organisms in the Nile River.
C) To reduce the consumption of marine algae by zooplankton.
D) To change the water level of rivers and fully control seasonal floods.

7) Study the following diagram, which represents a food sequence in a marine ecosystem: [Predatory fish ⟶ Small fish ⟶ Zooplankton ⟶ Algae]. If predatory fish consume very large quantities of small fish, what is the resulting chain of ecological effects? 2 marks

A) A decrease in zooplankton numbers and an unlimited flourishing of algae.
B) An increase in zooplankton numbers, which affects algae growth and consequently leads to a failure to maintain balance.
C) Complete stability of the ecosystem and an increase in the biodiversity of coral reefs.
D) A sharp decrease in Nitrogen and Phosphorus levels in the surface layers.

8) In a coral reef environment, predatory fish play a vital indirect role in protecting the physical structure of the reefs. This is done by ..... 2 marks

A) secreting chemicals that neutralize the toxins of pesticides.
B) controlling the numbers of small organisms, such as sea urchins, which can destroy the reefs if their numbers increase abnormally.
C) increasing the penetration of the light needed for the growth of marine plants.
D) expelling zooplankton to prevent competition for coral shelter.

Second: Essay Questions

Q9: State the four main roles that humans can play to help maintain ecological balance.

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Q10: What is meant by sustainable development? And how can humans apply it in different sectors to protect the environment? **2 marks**

Q11: Explain, based on what you have studied, how overfishing of predatory fish affects the ecological stability of lakes and rivers. **2 marks**

Q12: The Nile River faces major environmental challenges that threaten its sustainability. State three main challenges facing the Nile. **1 mark**

Q13: State three examples that shows turning individuals' behavior into small, environmentally friendly daily practices that any student can apply in their daily life. **2 marks**

Q14: **Analyze the ecological mechanism by which excessive nutrient enrichment with nitrogen and phosphorus causes the deterioration of aquatic ecosystems?** **3 marks**

Q15: **Maintaining the structure of coral reefs is linked to the existence of a balanced food web. Discuss the role played by predatory fish in protecting coral reefs from physical destruction, and name the target organism.**

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3 marks

Q16: **Based on the research questions, how can humans use modern technology to adapt to the effects of climate change and protect the Nile River? Give two specific examples from your studied?** **3 marks**

Assessment

Model (A)

First: Choose the correct answer

1) **The numbers of living organisms at each level of the food chain are regulated by a specific mechanism. What is this direct mechanism according your studied?** **2 marks**

A) The natural flow of energy, starting from producers and moving to consumers.
B) The absolutely static constancy of zooplankton numbers throughout the year.
C) An increase in the levels of heavy metals in the waters of rivers and lakes.
D) The complete dependence of top consumers on non-living components only.

2) **Each species of living organisms interacts with others in multiple ways. If the numbers of predatory fish decline in a marine environment as a result of overfishing, what is the direct biological consequence?** **2 marks**

A) The number of small fish increases excessively, leading to an unbalanced consumption of food resources and a disturbance of the ecosystem.
B) Small fish automatically turn into producers that carry out photosynthesis.
C) The growth rate of algae decreases as a result of the sudden increase in chemical nutrients.
D) An immediate dynamic stability occurs that preserves biodiversity without the need for energy.

3) **Predatory fish help maintain the balance of coral reefs by controlling the numbers of certain small organisms. What are these organisms that may destroy the reefs if their numbers increase abnormally?** **2 marks**

A) Zooplankton
B) Sea urchins.
C) Green algae.
D) Herbivorous fish.

Second: Essay Questions

Q4: Explain three of the practices and policies that must be activated to protect water quality and to confront overfishing and climate change. **3 marks**

Q5: Identify precisely the four main specific roles that humans can play in their daily or professional lives to maintain ecological balance. **3 marks**

Q6: Explain scientifically how the consumption of very large numbers of small fish by predatory fish leads to a sequential disturbance in algae growth and a failure to maintain balance in the aquatic system. **3 marks**

Model (B)

First: Choose the correct answer

1) Energy begins to flow in the aquatic ecosystem from specific organisms that carry out photosynthesis. What is the scientific name of this group of organisms? — 2 marks

A) Producers (such as algae and plants).
B) Herbivorous consumers.
C) Zooplankton.
D) Top predatory fish.

2) Some facilities discharge chemicals such as pesticides and heavy metals into water. What is the direct effect of these chemicals on aquatic ecosystems? — 2 marks

A) Improving the balance levels of nutrients such as phosphorus.
B) A negative effect on water quality and harm to the health of living organisms.
C) An increase in the rate of energy flow through the food web in a normal way.
D) Stimulating the growth of coral reefs to provide a new habitat for fish.

3) In a balanced marine environment, if the numbers of sea urchins increase abnormally because of the absence of their biological controller, what direct physical damage is expected? — 2 marks

A) Destruction of the structure of coral reefs, causing a loss of diversity.
B) Increased light penetration and photosynthesis in the deeper layers.
C) A complete decrease in industrial pollution and stability of resources.
D) Sea urchins turning into primary producers that support energy.

Second: Essay Questions

3 marks

Q4: Explain in detail how sustainable development and the shift to environmentally friendly practices contribute to protecting aquatic ecosystems, showing applications related to agriculture, industry, and daily life.

Q5: Explain precisely the three main specific challenges facing the Nile River and threatening its sustainability for future generations.

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3 marks

Q6: Explain scientifically how the excessive increase in the levels of nutrients such as nitrogen and phosphorus in aquatic systems leads to a severe disturbance of ecological balance and the continuity of aquatic life.

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3 marks

Model (C)

First: Choose the correct answer

1) Ecological balance in aquatic ecosystems is known as a state of stability that occurs when living organisms interact with non-living components. What is the type of this stability as you studied? 2 marks

A) Temporary stability that disappears when human activities cease.
B) Static stability that prevents any change in numbers.
C) Dynamic stability that ensures the continuity of life.
D) Chemical stability limited to bedrock only.

2) Overfishing and the destruction of natural habitats such as swamps and coral reefs lead to severe environmental consequences. 2 marks
What is the direct result according the study book?

A) Loss of biodiversity and disturbance of ecological balance.
B) An increase in the levels of environmental awareness and education.
C) Improved energy flow through food webs.
D) A constant water level of the Nile River, protecting it from drought.

3) What is the modern technology scientifically proposed to reduce water consumption in the agricultural sector and ensure the sustainability of resources? 2 marks

A) Total reliance on untreated industrial wastewater.
B) Increased use of pesticides and heavy metals.
C) Building dams and projects that completely divert river waters.
D) Modern agricultural techniques that reduce consumption.

Second: Essay Questions

Q4: Propose a technological and administrative strategy to protect the Nile River and adapt to the effects of climate change (such as drought, floods, and fluctuating flow levels), explaining the warning and control mechanisms. 3 marks

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Q5: Identify precisely three procedures or research questions set by the study book to evaluate policies and community awareness in protecting the Nile River's ecosystem from industrial pollution. 3 marks

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Q6: Explain scientifically the ecological importance of the presence of predatory fish in the aquatic ecosystem, and its direct relationship to regulating prey numbers and stabilizing natural habitats. 3 marks

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***** End of Questions *****