ALBERTA BIOLOGY 20 · UNIT 1 · 25 QUESTIONS

Energy and Matter Exchange in the Biosphere — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **The biosphere is best described as**

- **A** the thin layer of Earth in which living organisms exist
- **B** all of the water on the surface of Earth
- **C** the layer of gases that surrounds Earth
- **D** all of the rock and soil that forms the crust of Earth

Understand It with Pulse | Flag a mistake

2 **Which process removes carbon dioxide from the atmosphere and stores the carbon in glucose?**

A Cellular respiration

B Photosynthesis

C Combustion

D Decomposition

Understand It with Pulse | Flag a mistake

3 **A deer feeds on grasses and shrubs. In this relationship, the deer is a**

A producer

B secondary consumer

C primary consumer

D decomposer

Understand It with Pulse | Flag a mistake

4 **Decomposers such as bacteria and fungi are essential to an ecosystem because they**

A capture energy from sunlight for producers

B convert nitrogen gas into usable nitrates

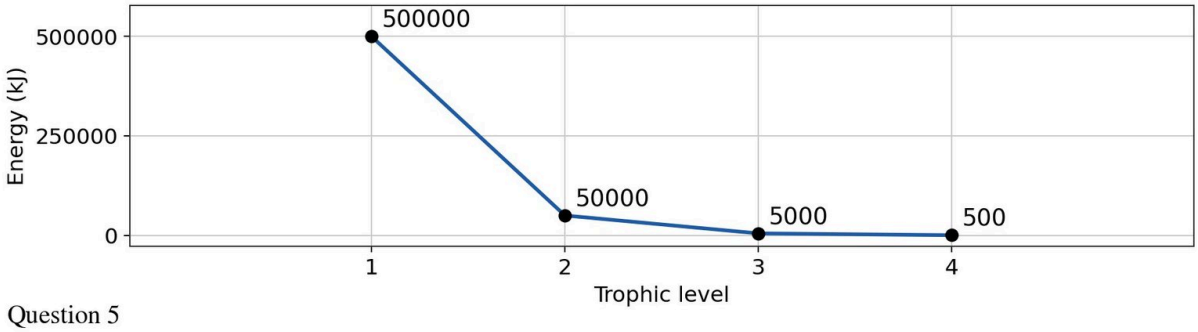
C transfer energy from consumers back to producers

D break down dead matter and release nutrients into the soil

Understand It with Pulse | Flag a mistake

5

The graph shows the energy stored at each trophic level in a grassland. The first trophic level is the producers and the second trophic level is the primary consumers. The energy stored by the primary consumers, in kJ, is _____



Question 5

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ANSWER

Understand It with Pulse | Flag a mistake

6 **A food chain in a wetland is**
cattails → snails → frogs → herons
In this food chain, the frog is a

A producer

B primary consumer

C tertiary consumer

D secondary consumer

Understand It with Pulse | Flag a mistake

7 **As energy moves from one trophic level to the next, most of the energy is**

A lost as heat to the surroundings

B stored permanently in body tissues

C converted into new producers

D recycled back to the Sun

Understand It with Pulse | Flag a mistake

8 **Nitrogen gas in the atmosphere is converted into compounds that plants can use by the process of**

A denitrification

B nitrification

C nitrogen fixation

D decomposition

Understand It with Pulse | Flag a mistake

9 **Phytoplankton in a lake capture 2400000 kJ of energy. Using the 10% rule, the energy available to the tertiary consumers (the fourth trophic level), in kJ, is ____**

ANSWER _____

Understand It with Pulse | Flag a mistake

10 **The phosphorus cycle differs from the carbon and nitrogen cycles because phosphorus**

- **A** cycles only through the atmosphere
- **B** has no important gas phase and moves mainly through rock, soil, and water
- **C** is not required by living organisms
- **D** is converted into a gas by bacteria in root nodules

Understand It with Pulse | Flag a mistake

11 **A pyramid of numbers can be inverted, with fewer organisms at the base than above it, when**

- **A** producers reproduce more quickly than consumers
- **B** one large producer, such as a tree, supports many small consumers
- **C** consumers are larger than the producers
- **D** energy is lost as heat at each transfer

Understand It with Pulse | Flag a mistake

12 **DDT sprayed on crops washed into a lake. Because of biomagnification, the organisms most seriously harmed by the DDT would be the**

A algae in the lake

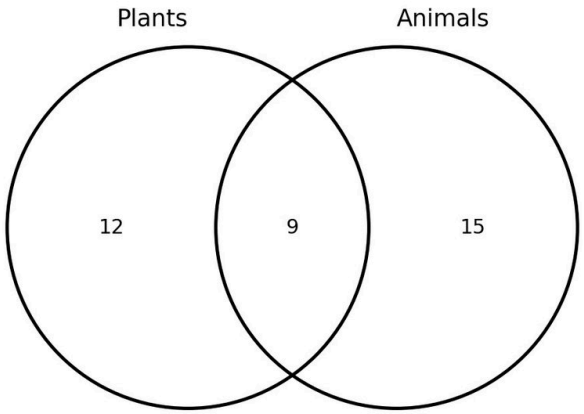
B zooplankton

C small fish

D top predators, such as ospreys

Understand It with Pulse | Flag a mistake

13 **The Venn diagram shows the diets of 36 animals in a grassland. The left circle is animals that eat plants and the right circle is animals that eat animals. The number of animals that are omnivores is _____**



Question 13

The Venn diagram shows the diets of 36 animals in a grassland. The left circle is animals that eat plants and the right circle is animals that eat animals. Animals in the overlap eat both plants and animals. The number of animals that are omnivores is ____

ANSWER

Understand It with Pulse | Flag a mistake

14 **Carbon stored underground for millions of years is returned to the atmosphere most directly by**

A photosynthesis in forests

B the respiration of animals

C the burning of fossil fuels

D the weathering of limestone rock

Understand It with Pulse | Flag a mistake

15 **Denitrifying bacteria in the soil convert**

A nitrogen gas into ammonia

B nitrates into nitrogen gas

C ammonia into nitrites

D proteins into ammonia

Understand It with Pulse | Flag a mistake

16 **Bacteria living near deep-sea vents, where no sunlight reaches, produce food by**

A photosynthesis

B cellular respiration

C fermentation

D chemosynthesis

Understand It with Pulse | Flag a mistake

17 **An earthworm that feeds on dead leaves lying on the forest floor is classified as a**

A detrivore

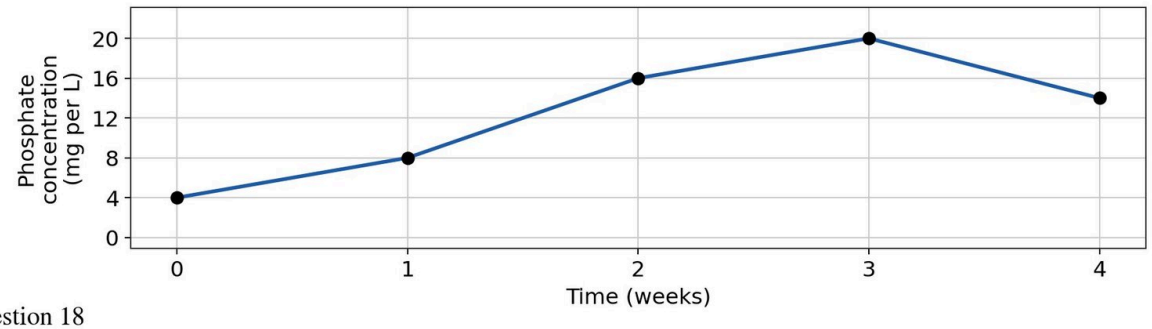
B decomposer

C producer

D parasite

Understand It with Pulse | Flag a mistake

18 **The graph shows the phosphate concentration in a lake after fertilizer runoff. The phosphate concentration in week 2, in mg per L, is _____**



Question 18

The graph shows the phosphate concentration in a lake after fertilizer runoff. The phosphate concentration in week 2, in mg per L, is ____

ANSWER _____

Understand It with Pulse | Flag a mistake

19 **Compared with a simple food chain, a food web usually makes an ecosystem more stable because**

A producers create more energy in a web

B each species feeds on only one other species

C decomposers are no longer needed

D if one species declines, most consumers have alternative food sources

Understand It with Pulse | Flag a mistake

20 **In the nitrogen cycle, nitrification is the conversion of**

- **A** nitrates into nitrogen gas by bacteria
- **B** ammonia into nitrites and then into nitrates by bacteria
- **C** nitrogen gas into ammonia by lightning
- **D** nitrates into proteins by plants

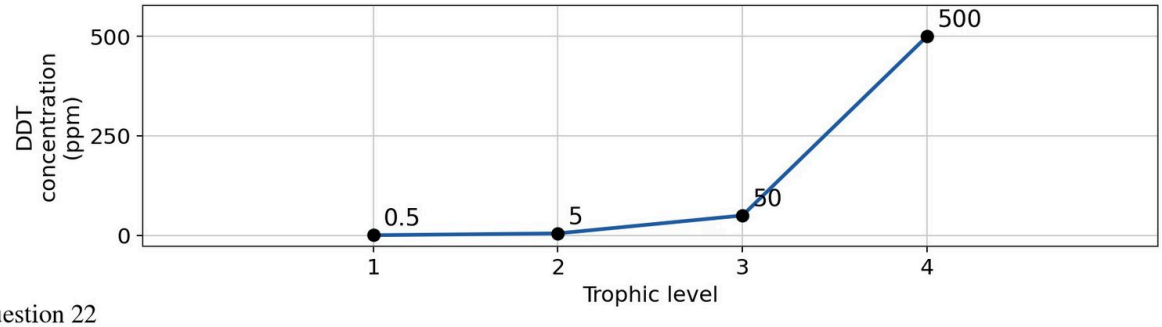
Understand It with Pulse | Flag a mistake

21 **Which sequence shows the correct direction of energy flow in an ecosystem?**

- **A** Sun → producer → herbivore → carnivore
- **B** Sun → herbivore → producer → carnivore
- **C** producer → Sun → herbivore → carnivore
- **D** herbivore → carnivore → producer → Sun

Understand It with Pulse | Flag a mistake

22 **The graph shows the concentration of DDT at each trophic level in a lake. The first trophic level is phytoplankton, the second is zooplankton, the third is small fish, and the fourth is herons. The concentration of DDT in the herons, in ppm, is _____**



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ANSWER

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23 **When nitrogen compounds are assimilated by a plant, the nitrogen is used mainly to build**

- A amino acids and proteins
- B glucose and starch
- C fats and oils
- D cellulose and lignin

Understand It with Pulse | Flag a mistake

24 **Phosphorus becomes available to plants in the soil mainly when**

- A lightning strikes the ground
- B bacteria take it in from the air
- C rocks containing phosphate weather and erode
- D animals die and decompose

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25 **In a grassland food web, grass is eaten by mice. Mice are eaten by both snakes and owls, and owls also eat snakes. The number of different trophic levels at which the owl feeds is ____**

ANSWER

Understand It with Pulse | Flag a mistake

ANSWER KEY

1. A
2. B
3. C
4. D
5. 50000
6. D
7. A
8. C
9. 2400
10. B
11. B
12. D
13. 9
14. C
15. B
16. D
17. A
18. 16
19. D
20. B
21. A
22. 500
23. A
24. C
25. 2

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