

Exercise walk-through

2.6

Adaptations

AP Environmental Science

The four kinds of ecosystem service

provisioning

products taken directly: food, fresh water, timber, fibre

regulating

processes that keep conditions stable: climate regulation, water filtration, pollination, flood control

supporting

the ones the others rest on: soil formation, nutrient cycling, photosynthesis

cultural

non-material value: recreation, beauty, spiritual and educational worth

Anthropogenic

activity disrupts these, and the cost is economic as well as ecological – which is the point the essay question wants made.

Island biogeography, and what disturbs an ecosystem

island size

a **larger** island supports more species – more habitat, larger populations, lower extinction

distance

a **nearer** island receives more colonists from the mainland

so

big, near islands hold the most species; **small, remote** ones the fewest

isolation drives evolution

island species often become **specialists**, which makes them vulnerable to **invasive species**

zones of stress

at the edges of a species' tolerance range, where individuals survive but do not thrive or reproduce well

over geological time

climate has shifted for many reasons, and sea level has risen and fallen with the amount of glacial ice

Anthropogenic

activity disrupts ecosystem services at a **real economic and ecological cost** – losing pollinators forces farmers to pay for pollination.

Exam tips

- Describe biodiversity at three levels: **genetic, species, and habitat**, and link higher diversity to greater **resilience**.
- **Specialist** species (narrow needs) are more vulnerable than **generalists** when a habitat changes.
- Distinguish **primary** succession (bare rock, no soil, slow) from **secondary** (soil intact, faster).
- Explain a **keystone species** (outsized effect) and an **indicator species** (signals ecosystem health).
- Name the four **ecosystem services** (provisioning, regulating, cultural, supporting) with examples.

Exercises 2.1-2.3

2.1 Name the three types of adaptation.

[3]

2.2 Classify thick fur on an arctic fox.

[1]

2.3 How do adaptations spread through a population?

[1]

Exercises 2.1-2.3

2.1 Name the three types of adaptation. [3]

2.1

- Structural, physiological, behavioral
-

2.2 Classify thick fur on an arctic fox. [1]

2.2

- Structural
-

2.3 How do adaptations spread through a population? [1]

2.3

- By natural selection over generations

Exercise 3.1

3.1 Hibernating through winter is a

[1]

☐

A structural adaptation

B physiological adaptation

C behavioral adaptation

D learned habit only

Exercise 3.1

3.1 Hibernating through winter is a

[1]

☐

A structural adaptation

B physiological adaptation

C behavioral adaptation

D learned habit only

3.1 C

- a behavioral adaptation

Exercise 3.2 (a)

3.2 A desert plant has a thick waxy coating and stores water in its stem.

(a) Classify each of these two features.

[2]

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(a) Classify each of these two features.

[2]

(a)

- Waxy coating = structural; storing water = physiological (or structural stem)

Exercise 3.2 (b)

3.2 A desert plant has a thick waxy coating and stores water in its stem.

(b) Explain how these adaptations help it survive.

[2]

Exercise 3.2 (b)

3.2 A desert plant has a thick waxy coating and stores water in its stem.

(b) Explain how these adaptations help it survive.

[2]

(b)

- The waxy coating reduces water loss and the stored water lets the plant survive drought, so it survives in a dry desert

Exercise 3.3

3.3 Explain how a beneficial adaptation becomes common in a population over time. [2]

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3.3

- Individuals with the adaptation survive and reproduce more, passing the trait to offspring; over generations it becomes common in the population