



Stability and change: practice questions

6 questions • 20 marks • mark scheme at the back

For IB Diploma Biology SL undefined. **HL only** is additional higher level content, for HL students only.

Name

Total / 20

1 PAPER 1A STYLE [1 mark]

When is harvesting of a wild fish population sustainable?

- A. ☐ When only adult fish are caught
- B. ☐ When the population is above its carrying capacity
- C. ☐ When the rate of harvesting is lower than the rate of replacement
- D. ☐ When the catch is the same every year

2 PAPER 1A STYLE [1 mark]

Why is a sealed glass vessel preferred to an open tank for a mesocosm?

- A. ☐ It stops light energy entering
- B. ☐ It prevents entry and exit of matter but allows energy transfer
- C. ☐ It keeps the temperature constant
- D. ☐ It prevents decomposers from growing

3 PAPER 2A STYLE [5 marks]

(a) The forest area of a part of the Amazon basin fell from 520 000 km² to 442 000 km² (practice figures). Calculate the percentage change in forest area. [2] (b) Explain how deforestation on this scale could reduce rainfall over the remaining forest. [3]

Answer =

PAPER 1B STYLE

[4 marks]

The table shows DDT concentrations in an estuary food chain (practice data). (a) Calculate how many times greater the concentration is in the fish-eating birds than in the zooplankton. [1] (b) Explain the pattern shown in the data. [3]

DDT concentration	
Sample	DDT concentration / parts per million
Water	0.00005
Zooplankton	0.04
Small fish	0.5
Large fish	2.0
Fish-eating birds	25

Answer =

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PAPER 2B STYLE

[6 marks]

Explain how the use of fertilizers on farmland can lead to the death of fish in a nearby lake.

[illegible]

Outline the effects of plastic pollution on marine life.

Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1]

C C [1]

2. [1]

B B [1]

3. [5]

- (a) $(442\,000 - 520\,000) \div 520\,000 \times 100$ [1]
- (a) -15% / decrease of 15% [1]
- (b) fewer trees so less transpiration / less water vapour released into the atmosphere [1]
- (b) less evaporative cooling / less driving of air flows that bring in moist air [1]
- (b) water vapour from transpiration normally condenses and falls as rain further inland / water is recycled [1]
- (b) longer dry season / drought stress / more fires reduce forest further (positive feedback) [1]
- max 5

4. [4]

- (a) $25 \div 0.04 = 625$ times [1]
- (b) concentration increases at each higher trophic level / biomagnification [1]
- (b) DDT is persistent / not broken down [1]
- (b) DDT is fat-soluble / stored in fatty tissue / not excreted [1]
- (b) each consumer eats many organisms from the level below, taking in all their DDT [1]
- max 4

5. [6]

- nitrate / phosphate fertilizers leach from soil (into the lake) [1]
- nutrient enrichment of the water is eutrophication [1]
- rapid growth of algae / algal bloom [1]
- algae block light so plants below cannot photosynthesise and die [1]
- algae / plants die and are decomposed by bacteria [1]
- decomposers respire aerobically / use oxygen [1]
- biochemical oxygen demand / BOD increases [1]
- dissolved oxygen concentration falls / water becomes hypoxic [1]
- fish cannot respire aerobically and die [1]
- Do not accept 'algae use up oxygen by photosynthesis'
- max 6

6. [3]

- plastics are non-biodegradable / persist for a long time [1]
- macroplastic / nets / bags cause entanglement, e.g. of seals / turtles / seabirds [1]
- macroplastic swallowed, e.g. bags mistaken for jellyfish by turtles, blocking the gut / starvation [1]
- microplastics eaten by zooplankton / filter feeders / fish [1]
- microplastics pass along food chains / carry toxic chemicals [1]
- max 3