

IB biology past essay questions HL and SL all units and mark scheme

2023 (A+)

Outline what is meant by the trophic level of an organism with three examples from one named habitat. (4 max) - Answer-feeding level for an organism in a food chain

naming of habitat (1 mark)

naming three trophic levels correctly (1 mark)

three examples forming a food chain from the named habitat (1 mark)

2. Compare the ways in which autotrophic, heterotrophic and saprotrophic organisms obtain energy. (6 max) - Answer-autotrophs use an external / non-organic energy source

(reject statements suggestion that energy is made)

(some) autotrophs use light / (some) autotrophs use photosynthesis

(some) autotrophs use inorganic chemical reactions / (some) autotrophs use chemosynthesis

heterotrophs obtain energy from other organisms

heterotrophs (usually) ingest food / consume food

saprotrophs obtain energy from non-living matter / dead organisms

saprotrophs digest organic matter extracellularly

3. Draw a labelled sigmoid population growth curve. 4 marks - Answer-x-axis (time) and y-axis (number in population/of individuals) correctly labelled; (do not accept growth on y-axis)

S curve correctly drawn;

lag phase;

exponential/log phase;

population growth slowing down / transitional phase / environmental resistance;

plateau phase;

To award marks phases must be labelled not just drawn. Award 3 max if no axes shown.

4. Explain the factors that cause a population to follow the sigmoid (S-shaped) growth curve. (8 max) - Answer-during exponential growth the population grows at an increasing rate

all / most / many offspring survive / birth rate higher than death rate

all / most / many offspring reproduce

each generation produces more offspring than the last

plateau reached eventually / population levels off / birth rate equals death rate

when carrying capacity of environment is reached

e.g. when no more food / nutrients / resources available

e.g. when no more space for nesting / space for another purpose is available

e.g. when numbers of predators have increased

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