

Answers to examination-style questions

Answers	Marks	Examiner's tips
1 a) i) a group of organisms of the same species living in the same habitat / area	1	
ii) reference to feeding role; reference to habitat role / role determined by abiotic factors	2	The niche of an organism refers to its biotic role (what it feeds on and what may feed on it) and its abiotic role (where it lives in the habitat in terms of the abiotic conditions it requires).
b) i) temperature and rainfall favourable / high in tropical forest and unfavourable / low in Arctic tundra	1	A 'physically hostile environment' will have unfavourable abiotic conditions.
ii) diversity of organisms is usually low in arctic tundra and high in tropical forest; abiotic factors dominate distribution / diversity / abundance in arctic / have little affect in tropical forest	2 max.	Few species can survive in ecosystems where the abiotic factors are unfavourable.
2 a) mixes randomly / completely in population; marking is not toxic / does not wear off; no migration / emigration / immigration; no change in population size between samples / life span longer than time between release and recapture; no births or deaths; not trap-happy / trap shy	2	The method of marking should not have an effect on the organisms in terms of their survival or distribution within the population.
b) i) correct figures used in equation; 104	2	Correct answer = 2 marks.
ii) large sample more representative of population	1	Reject accurate / statistically viable.

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<p>3 a) i) more people survive to reproductive age; better pre-natal care / health care of mother; better nutrition of mother</p>	1 max.	Any suitable reason for an increase in birth rate would be acceptable.
<p>ii) better nutrition; better sanitation; (widespread) introduction of health care; better post-natal care (mother or child); vaccination programmes</p>	1 max.	Again any suitable reason for a decrease in death rate would be acceptable.
<p>b) i) birth rate decreasing; as the death rate is constant but births minus deaths are falling</p>	2	You need to use the information provided in the stem of part (b) as well as the information provided on the graph.
<p>ii) reduces population growth until 1989/90 as more net emigration; increases population growth from 1989/90 as more net immigration</p>	2	
<p>4 a) i) A – high proportion of young, decreasing proportion in successively older groups / low proportion of older people; B – approximately same proportion of all age groups</p>	2	Must have pattern, that is, refer to whole age range.
<p>ii) a large base to pyramid / high proportion of young / high birth rate</p>	1	The ability to interpret age pyramids is an essential examination skill.
<p>b) birth rate and death rate; emigration and immigration</p>	2	You may be asked to calculate population growth rates from data on birth rate and death rate.

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5 a) interspecific competition	1	Interspecific competition is <i>between different</i> species.
b) i) population declines as experimental area has higher number than control areas / reference to Figure 1	1	When both species are together the number of tree lizards declines, as shown in Figure 1.
ii) population not affected as number is similar in both areas / in Figure 2	1	The number of canyon lizards remains similar in both the control and experimental areas, as shown in Figure 2.
c) large population fluctuation / decrease and increase for canyon lizard / in Figure 2	1	There is a far greater fluctuation in the number of canyon lizards during the four years compared to canyon lizards.
d) more intraspecific competition / high density linked to competition	1	The increase in population density in the experimental area would cause increased intraspecific competition for food and other resources.
6 a) quadrat placed (along line) at 1 metre / regular intervals; count number / calculate per m ²	2	As the data on the graph indicates per m ² , the method must indicate how this is achieved.
b) pH; linked to nutrient availability / enzyme activity; nutrient; effect of named nutrient on growth; light; adapted to lower light availability for photosynthesis; air movement; not adapted to water loss	2 max.	Allow other abiotic factors with explanation, for example temperature and enzyme activity. The named nutrient could be nitrate and its effect on protein synthesis.
c) i) number of seeds; amount of nutrients; pH; temperature; light; carbon dioxide; size of pots; spacing of seeds	2 max.	Any factor that could affect the development of the seeds needs to be controlled. In this investigation they are almost exclusively abiotic factors.

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<p>ii) A <i>Ranunculus bulbosus</i> B <i>Ranunculus acris</i> C <i>Ranunculus repens</i></p>	1	The germination of the seedlings is dependent on the soil moisture. <i>Ranunculus repens</i> is most abundant in the furrows where soil moisture is highest. <i>Ranunculus bulbosus</i> is abundant in the ridges where soil moisture is lowest.
<p>iii) breed together; production of fertile offspring (if same species) <i>or</i> use of DNA; similar base sequence / 'fingerprint'</p>	2	Organisms of the same species do occupy the same ecological niche. However, these methods clearly show that they are of the same species.