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ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Education

Environmental Studies 1441

ENVS1 The Living Environment

Mark Scheme

2009 examination – January series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

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Environmental Studies

January 2009 **ENVS1**

Instructions: ; = 1 mark / = alternative response A = accept R = reject

Question 1

Reason why condition is necessary	Condition	
solvent for the chemical reactions needed for life	**(A)**	
absorbs biologically harmful UV radiation	**E**	**;**
provides an energy source for photosynthesis	**C**	**;**
allows efficient enzyme reactions	**B**	**;**
allows aerobic respiration	**D**	**;**
helps control the Greenhouse Effect	**F**	**;**

Total marks = 5

Question 2

2 (a) Trees need pollinators/bees (to produce nuts)**;**
bees/pollinators only present when orchids present**;**
orchids only grow on mature trees/natural/intact rainforest**;**
named factor eg nutrient cycling/cover from canopy/climatic factors**;** MAX 2

2 (b) (i) (Tree) population decline**;**
no tree seed germination/dispersal/are opened without agoutis**;**
increased competition with no dispersal**;** 2

2 (b) (ii) Mark-release-recapture/Lincoln index**;**
(trap/net) representative/random/systematic sample**;**
specific described/named method**;**
appropriate marking/non harmful method**;**
allow time to mix (with remaining population)**;**
description/number marked and unmarked (in second sample)**;**

$$\frac{n_1 \times n_2}{n_m}\text{;}$$

OR

find territory size/described method eg radiotracking/photography/sand traps/ visual count**;**
repeats to calculate the mean**;**
calculation eg total area ÷ territory size/multiply for the total area**;**
any stated assumptions eg no overlap/no vacant areas**;** MAX 3

2 (b) (iii) Decomposers/detritivores/saprobionts/saprophytes/saprotrophs/ mycorrhizal fungi/bacteria/fungi/named taxon**;** 1

2 (c) Trees need intact/mature forest to be productive/depend on other forest species**;**
other wildlife benefits**;**
profits from harvest used to buy/protect rainforest**;**
intact (rain)forest has an economic value for named example eg ecotourism**;**
justification for rainforest expansion**;** MAX 2

Total marks = 10

Question 3

3 (a) Evidence**;;;**
Expansion**;;;**

eg <u>Environmental/ecological</u> impact/EIA
results of feasibility studies/CBA
public/representatives/interested parties/opponents' viewpoints
expert witness statements
examples of experts eg RSPB
scientific data assessments/surveys/information
example of data eg bird populations/pollution levels/fish populations MAX 3
[**R** inspectors report/Secretary of State]

3 (b) Increase in traffic/transportation developments/
construction phase cause traffic problems**;**
named problem eg noise/air pollution**;**
difficulties with water transport**;**
reduction in recreation potential eg bore surfing**;**
aesthetic damage**;**
mining/quarrying of raw materials**;**
raised water table causing flooding (due to slower drainage)**;**
impact on other activities in estuary eg fisheries/waste disposal**;** MAX 2

3 (c) Ramsar/SPA**;** 1

3 (d) Stated effect on named abiotic factors**;;**
eg turbidity
light penetration
accumulation of sediment
water depth
pollutant concentration
salinity
impact on named taxa**;;;** MAX 4

Total marks = 10

Question 4

4 (a) (i) Named economic benefit**;;**
eg new foods
for breeding programmes
biological control agents
medicines
physiological research
wood
oils
other named products
(eco)tourism
stated employment opportunities
named life support system <u>linked to economic activity</u> eg pollination/nutrient cycling/atmospheric balance/water cycle MAX 2
[**R** education, ethics, morals, aesthetic and recreation unless linked to economic activity]

4 (a) (ii) <u>Named</u> dependence on flagship species**;;**
habitat protected**;**
named habitat feature**;;** MAX 2

4 (b) International trade has been banned/restricted**;**
market has declined/less demand**;**
less profit for ivory**;**
reduction in poaching (linked to sales)**;** MAX 2

4 (c) Correct statement/description**;**
correct explanation**;;**
eg hunters take largest/oldest individuals/with tusks
remaining population is younger/smaller mass/smaller tusk mass/ greater proportion of tuskless
tuskless elephants not targeted/allowed to reproduce
selection leaves only tuskless/small tusked individuals/ less competition for tuskless elephants MAX 2

4 (d) Separate breeding programmes/interbreeding prevented**;**
because there are two gene pools**;**
different habitat requirements/resource provision**;**
retain genetic identity/distinctiveness of species**;**
ensure that reintroduction is into the correct places**;** MAX 2

Total marks = 10

Question 5

5 (a) Arctic foxes (will have less food)/population decrease**;**
fox predation on lemmings and skuas will increase/fewer lemmings and skuas**;**
lemmings will face less competition for food (from Brent geese)/lemmings increase**;**
weasels/owls may have fewer lemmings to eat**;**
other valid impact**;** MAX 3

5 (b) (i) Reason**;**
eg abiotic factors such as unusually poor weather/flooding
biotic factors such as large number of predators/competitors, disease

Expansion**;**
eg plant food declines/predators lost other food source/lemmings die/
failed reproduction 2

5 (b) (ii) Number of different species/species richness/total number of all species**;**
population sizes/number of individuals of each species**;**

correct formula with key–2 marks, max 1 if no key 2

5 (b) (iii) Few nutrients available to plants/slow cycling/slow release**;**
plant growth is slow/reduced/plants less abundant**;**
less food for lemming survival/reproduction**;** MAX 3

Total marks = 10

Question 6

6 (a) Variety of habitats/niches**;**
biological corridors**;**
variety of food plants/complex food webs**;**
supplementary food/resources**;**
declining quality of wider environment**;**
no/fewer damaging practices**;**
fewer predators**;** MAX 3

6 (b) Plant feature <u>with</u> explanation**;;**
eg food/nest site/nesting material/shelter/toxins/pollination/invasive/
crowding out MAX 2

6 (c) Use light traps/appropriate method/<u>named</u> moth trap**;** (1)

identify moths/count species/numbers caught**;**
set traps in representative/different areas/positions in garden/habitats/
use several traps**;**
repeat at different times/seasons**;** (MAX 2) MAX 3

6 (d) Hydrosphere**;**
colonisation**;**
sediment build up/shallow water**;**
change in other named abiotic factor**;**
competition/dominance**;**
change in other named biotic factor**;**
named taxon (linked to different aspects of succession)**;;**
reduction in (aquatic) species diversity/loss of aquatic habitat**;** MAX 5

Quality of Written Communication

Mark	Descriptor
2	All material is logically presented in clear, scientific English and continuous prose. Technical terminology has been used effectively and accurately throughout. At least half a page of material is presented.
1	Account is logical and generally presented in clear, scientific English. Technical terminology has been used effectively and is usually accurate. Some minor errors. At least half a page of material is presented.
0	The account is generally poorly constructed and often fails to use an appropriate scientific style to express ideas.

MAX 2

Total marks = 15