AQA

A-LEVEL
Environmental Studies

ENVS1: The Living Environment
Mark scheme

2440
June 2016

Version 1.0: Final Mark Scheme

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

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this Mark Scheme are available from aqa.org.uk

Environmental Studies

June 2016 **ENVS1**

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

AO = Assessment Objective

<table>
<tr><th>Question</th><th colspan="2">Answers</th><th>Mark</th><th>AO / Spec. Ref.</th></tr>
<tr><td>1</td><td></td><td>
<table>
<tr><th>Name of method</th><th>How land-use conflict is managed</th></tr>
<tr><td>Space Zoning</td><td>Allocates different areas to different land uses</td></tr>
<tr><td>Cost benefit analysis/CBA;</td><td>Assesses the economics of a development by assigning a monetary value to all aspects of a development</td></tr>
<tr><td>Green Belt designation</td><td>Strict planning control/ restricts development/ prevents urban expansion/sprawl/encourage use of brownfield sites;</td></tr>
<tr><td>Public inquiry;</td><td>A government inspector collects evidence to recommend whether planning permission should be granted</td></tr>
<tr><td>Leopold Matrix</td><td>Quantitative comparison of the (environmental) impacts of a development;</td></tr>
<tr><td>Time Zoning;</td><td>Allocates different times to different land uses in the same area</td></tr>
</table>
</td><td>5</td><td>AO1
3.1.4</td></tr>
<tr><td>Total</td><td colspan="2"></td><td>5</td><td></td></tr>
</table>

Question	Answers	Mark	AO / Spec. Ref.
2(a)(i)	CO_2 has reduced/used in photosynthesis/dissolved into oceans/ stored in sedimentary rocks/fossil fuels**;** CO_2 is a greenhouse gas/absorbs IR**;** [**R** absorbs/retains heat] [**R** if CO_2 is not mentioned]	2	AO2 3.1.1
2(a)(ii)	development of ozone (layer)**;** absorbed UV**;** less DNA damage/fewer mutations**;** enabled aerobic respiration**;**	max 2	AO2 3.1.1
2(b)	high heat capacity**;** liquid**;** solvent**;** low albedo (of liquid water)**;** cohesion/adhesion/surface tension**;** anomalous expansion/ice less dense/ice floats**;** change of state (over small temperature range)**;** transparent**;**	max 2	AO1 3.1.1
2(c)(i)	(large) region with characteristic climate **and** community/vegetation**;**	1	AO1 3.1.3
2(c)(ii)	low(est) species diversity/low(est) species richness**/**fewer interdependent relationships/simple food webs/chains**;** the change in population of one species has a large impact on other populations**;** [**R** lack of food/low productivity]	2	AO2 3.1.3
2(d)	habitat provision/modification**;** (inorganic) nutrient supply/symbiotic nutrition**;** protection from predators/parasites**;** [**A** qualified reference to disease]	max 1	AO1 3.1.3
Total		**10**	

Question	Answers	Mark	AO / Spec. Ref.
3(a)	compete for food/water**;** compete for breeding site/territory**;** predation**;** disease vector**;**	max 3	AO2 3.1.2
3(b)	control of (agricultural) pests**;** pollination of crop/economically important plant**;** [**A** seed dispersal] biomimicry**;** manufacture of medicine/medical research**;** food source/named resource for humans/other economically important species**;** flagship species for conservation funding/ecotourism**;**	max 2	AO1 3.1.2
3(c)(i)	2008**;**	1	AO2 3.1.3
3(c)(ii)	food**;** (above CC) reduced food availability increases mortality/reduces population**;** (below CC) increased food availability reduces mortality/increase population**;** density dependent limiting factor/homeostatic regulation**;** [**A** dynamic equilibrium] **OR** predation**;** (above CC) more food for predators increases ladybird mortality/ reduces population**;** (below CC) less food for predators reduces ladybird mortality/ increase population**;** density dependent limiting factor/homeostatic regulation**;** [**A** dynamic equilibrium] **OR** disease**;** (above CC) disease spreads more easily increasing mortality/reducing population**;** (below CC) disease spreads less easily reducing mortality/allows population increase**;** density dependent limiting factor/homeostatic regulation**;** [**A** dynamic equilibrium]	4	AO2 3.1.3
Total		**10**	

Question	Answers	Mark	AO / Spec. Ref.
4(a)(i)	**3 cm**: (increase) plant (wild thyme) to lay eggs on/ food for caterpillar **and** *(M. sabuleti* provides) food source/shelter/ carried to nest**;** **OR** (increase) able to lay eggs (on wild thyme) **and** no predation**;** **7 cm**: (decrease) predators present/no food source/ shelter over winter (from *M. sabuleti)***;** [**R** if predator named as *M. rubra*] **25 cm**: (decrease) no plant (wild thyme) to lay eggs on/ food for caterpillar**;**	3	AO2 3.1.3
4(a)(ii)	niche partitioning/different niches/low niche overlap**;** reduced competition for named resource eg food/nesting site**;** different range of tolerance to named abiotic factor**;**	max 2	AO2 3.1.3
4(b)	succession deflected/climax community prevented by human management/named human activity**;** [**A** farming, mowing] [**R** grazing, burning]	1	AO1 3.1.3
4(c)(i)	120 × 97 = 11640 **and** 11640 × 5 /100 = 582**;**	1	AO3 3.1.5
4(c)(ii)	co-ordinates/grid sampling area**;** random/systematic locations**;** quadrat**;** grid/point (quadrat)/specified size of quadrat (10 cm to 1 m square)**;** multiple samples for reliable/valid/representative results**;** find mean**;**	max 4	AO3 3.1.5

Question	Answers	Mark	AO / Spec. Ref.
4(d)	appropriate change in named abiotic factor**;;;;** eg light levels decrease humidity increases wind velocity decreases temperature decrease (in day/near ground) temperature increase (at night) temperature range decreases nutrient availability decreases temporarily nutrient availability increases soil moisture decreases/increases soil depth increases soil pH decreases different causes of change**;;**	max 4	AO1 3.1.3
Total		**15**	

Question	Answers	Mark	AO / Spec. Ref.
5(a)(i)	habitat change for named land use**;** eg agriculture, forestry, urban expansion, mining, reservoirs, energy generation, golf course [**A** deforestation] lack of management/named management technique**;** eg coppicing, burning	max 1	AO1 3.1.2
5(a)(ii)	burning/swaling**;** coppicing/pollarding**;** mowing/cutting**;** use of herbicide**;** scrub/vegetation removal**;** dredging**;** [**R** ploughing]	max 1	AO1 3.1.2
5(b)	food source**;** nesting site**;** shelter from predators/weather**;** biological corridor**;**	max 1	AO1 3.1.2
5(c)(i)	transect**;** regularly spaced samples**;** soil samples**;** same sized soil sample/same depth**;** multiple transects (at least 3) to increase reliability/find mean**;** repeat at different times of year**;** max 4 Tüllgren funnel/hand sorting**;** [**R** Tüllgren if referenced to equipment used in field] standardisation of Tüllgren funnel/hand sorting**;** identify species **AND** count number of each species**;** diversity index**;** max 3 [max total 3 if incorrect collecting method used]	max 5	AO3 3.1.5
5(c)(ii)	close to the hedge: lower pesticide concentrations**;** higher soil organic matter content (food source)**;** higher soil moisture (shelter from hedge)**;**	max 2	AO2 3.1.2
Total		**10**	

Question	Answers	Mark	AO / Spec. Ref.
6(a)(i)	access to countryside/higher slopes**;** provides opportunity for (informal) recreation**;** information/education on conservation/environment**;** support the rural economy/cultural heritage**;**	max 1	AO2 3.1.4
6(a)(ii)	named conflict with landscape conservation**;** eg aesthetic problems of buildings, ski lift, new roads named conflict with wildlife conservation**;** eg habitat destruction, car exhaust fumes, road salt, litter, erosion, noise, disturbance of feeding/breeding, road kill named conflict with other recreational users**;** eg walkers	max 1	AO2 3.1.4
6(b)	1. named example of legislation/scheme to protect species**;** Eg W&CA, CITES, SAP, SRP, EPS, EU Common Fisheries Policy 2. named example of legislation/designation/ /scheme to protect habitat**;** eg EU Habitat Directive, SSSI, ESS, HAP 3. example of named designated area**;** eg Exe estuary, Lundy Island 4. seed banks**;** 5. named seed bank**;** 6. education by named organisation/activity carried out by NGO**;** 7. captive breeding (and release)/reintroduction programme**;** 8. named management practice**;;** eg coppicing/pollarding, culling, grazing, burning, nesting sites 9. how practice controls named abiotic factor**;;** eg light, water 10. method to control named biotic factor**;;** eg control of competitors/predators, provision of interspecies relationships, provision of food 11. named taxon to illustrate two different examples**;;** [**R** taxon if in name of organisation] [**R** unlinked points]	max 6	AO1 3.1.2

	Quality of Written Communication **Mark** / **Descriptor** **2** – All material is logically presented in clear, scientific English and continuous prose. Spelling, punctuation and grammar are almost always correct. 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 and continuous prose. Minor errors occur in spelling, punctuation and grammar. Technical terminology has been used effectively, and is usually accurate. 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. Spelling, punctuation and grammar contain many errors.	2	
Total		**10**	