

Mark Scheme (Results)

Summer 2012

ELBS Environmental and Land-Based Studies
Sustainable Development
ES307 01

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Question Number	Answer	Mark
1(a)	Credit each valid trend identified with 1 mark e.g. rising global demand (1); rising Chinese supply (1); increasing ROW supplies (1); higher auto demand (1) Award 2 nd mark where trend described e.g. data or where trends compared e.g. Chinese supply rising faster than global demand (1).	(3)

Question Number	Answer	Mark
1(b)(i)	For max marks meaning of “ethical” to be clear either explicitly or implicitly and more than one rare-earth production issue to be addressed (e.g. Chinese monopoly > export limits > rising prices; environmental risks > radio-activity > health ...). Award 2-3 marks per developed ethical issue.	(4)

Question Number	Indicative Content	
1(b)(ii)	This item requires candidates to apply their understanding of environmental and economic sustainability to a natural resource which is becoming shorter in supply as demand rises, and whose production is environmentally risky. Candidates need to be writing about shortage and its implications as well as about environmental risks and damage at mining and processing sites.	
Level	Mark	Descriptor
	0	No rewardable material
1	1-2	Expect simple statements about environmental risk and shortage of supply based on reading of Figure 1b
2	3-4	Expect some development of one of these aspects e.g. dirty, dangerous radio-active mining sites; threats to supply of electronic goods posed by global shortage given role of rare-earths in modern manufacturing ..
3	5-6	Expect strong development of at least one aspect with clear reference to its sustainability significance e.g. environmental damage; compromise to living standards with resource shortage ..

Question Number		Indicative Content
1(b)(iii)		This item is a process question requiring candidates to explain how government (national and local) and waste-handling companies achieve safe and comprehensive waste collection, treatment and disposal. Expect to read about different types of waste (sewage; toxic; household ...), local authority collection infrastructure (e.g. bins/lorries/house-to-house/rotas), recycling, sewage treatment works, incinerators, land-fill, waste-minimisation programmes ...
Level	Mark	Descriptor
	0	No rewardable material
1	1-3	Expect basic statements about either treatment (e.g. recycle as much as possible..) or disposal (e.g. minimise land-fill ..)
2	4-6	Expect some development of at least treatment (e.g. waste separation > differential treatment ...) or disposal (e.g. tax land-fill to minimise; science & engineering involved in safe disposal of toxic waste, sewage ..). Infrastructure for secure collection systems as basis of secure treatment/disposal may be evident.
3	7-8	Expect a developed account of procedures for guaranteed collection and safe treatment and disposal of one type of waste e.g. UK household with reference to classifying hazard, government regulation, infrastructure and some underpinning science/engineering.

Question Number		Indicative Content
1(c)		This item is designed to assess candidate's ability to develop an SRD management plan for the rare-earth mine and processing site described. Basic responses will offer SRM actions to each description bullet in turn e.g. regulate & landscape open-cast site; maximise life of mine for job permanency ... Better answers will refer to management techniques e.g. site audit; interested part consultations ... in relation to concept of SRM.
Level	Mark	Descriptor
	0	No rewardable material
1	1-3	Expect simple action points to each description bullet e.g. clean-up of waste and safe disposal; extend life of resource ..
2	4-6	Expect action points to issues described to be developed so that semblance of plan evident with environmental and economic sustainability at its heart, and some detail for each action given e.g. tree planting; acids and radio-active material removed by licensed handling company ...
3	7-9	Expect a coherent SRM plan with some reference to management techniques such as auditing and consulting to achieve sustainability.

Question Number	Answer	Mark
2(a)(i)	<p>Award 1 mark to each valid, stated relationship e.g. population growth and rising use of natural resources (1); since 1985 rapid population growth and unsustainable resource use (1) ...</p> <p>Award 1 mark for appropriate data support of stated relationship.</p> <p>Max = 2 +2 (i.e. data-supported relationships) or 4x1 (i.e. distinctive relationships stated)</p>	(4)

Question Number	Indicative Content	
2(a)(ii)	<p>This item explores the value of resource use, including SRD in supporting economic development. Basic reading of Figure 2a suggests that economic development might be limited once resource use exceeds replenishment rate, and that previously when use less economic development supported. The process behind this resource-economic development relationship i.e. industrialisation and technology (e.g. energy use) likely to be explored by many candidates. Better candidates would be expected to explore of SRD in sustaining economic development by, for instance, prolonging resource supply.</p>	
Level	Mark	Descriptor
	0	No rewardable material
1	1-2	Expect identification of the basic relationship between resource use and economic development i.e. use supports development
2	3-4	Expect either exemplification of the basic relationship (e.g. industrialisation and energy use) or explanation of the value of SRD, especially once sustainable limits shown on Figure 2a reached
3	5-6	Expect explanatory response with both exemplification of use-development process and reference to value of SRD in sustaining future economic development

Question Number		Indicative Content
2(b)		This item looks for specific policy and practice recommendations from candidates. Such valid recommendations might range from slowing population growth, cutting economic development targets, inventing alternatives to natural resources; encouraging waste recycling to developing legal and international frameworks for conservation and efficiency. Better candidates will not only explain their recommendations but also show analysis in their answer, analysis related to SRD objectives and which leads to their recommendations.
Level	Mark	Descriptor
	0	No rewardable material
1	1-4	Expect some valid practices recommended as statements e.g. recycle and re-use more; pass conservation laws; find substitute raw materials ...
2	5-7	Expect some explanation of valid recommendations set against SRD objectives e.g. the role of international/legal conventions in conserving and managing scarce resources, including endangered plants, animals, habitats ...
3	8-10	Expect both explanation and analysis in the answer. The analysis to relate to the imperative for SRD policy and practice. Recommendations should be explained as if conclusions drawn from analysis of the need for SRD. Examples of the recommendations may be offered.

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