Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

ENVIRONMENTAL MANAGEMENT **0680/21**

Paper 2 Management in Context **May/June 2019**

MARK SCHEME

Maximum Mark: 80

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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Question	Answer	Marks
1(a)(i)	82 400;	**1**
1(a)(ii)	1 511 451;	**1**
1(b)(i)	*any three from:* some areas / glaciers, have no people; most of island **AND** has low population density (1–25 people per km^2); high density around, Reykjavik / capital city; high density around towns; high density areas are around, the coast / the roads;	**3**
1(b)(ii)	line plotted at 87; key completed **AND** bars match key;	**2**
1(b)(iii)	*any two from:* health care / disease; access to clean water / sanitation; economy of the, country / individual; diet / availability of food; conflict; (named) natural disasters;	**2**
1(c)(i)	October;	**1**
1(c)(ii)	4.7;	**1**
1(c)(iii)	*any three from:* low temperature, throughout the year / all year / most months; ground / crops, may freeze (in some months); high number of precipitation (days); snow / ice, melt may cause, flooding / water logging; short growing-season / growth between April to October; (because) higher temperatures / more daylight hours;	**3**

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Question	Answer	Marks
1(d)(i)	carbon dioxide **AND** water;	**1**
1(d)(ii)	*any two from:* light (energy) needed for, photosynthesis / for plants to grow; not enough hours of light for, part of the year / in winter; plants, grow faster / reach maturity faster;	**2**
1(e)(i)	**B** | **A** | **C** | **E** | **D** (*given*) ;; *4 correct [2]* *2–3 correct [1]*	**2**
1(e)(ii)	*any three from:* (geothermal) does not produce, carbon dioxide / greenhouse gases (at point of use); does not contribute to, global warming / (enhanced) greenhouse effect / climate change; does not produce, sulfur dioxide / SOx / NOx (at point of use); does not contribute to acid rain; renewable (energy resource) / will not run out / has unlimited supply; hot water (from rocks) can be used for other purposes (other than electricity);	**3**
1(e)(iii)	biofuel / bioethanol / biogas / biomass / wood / hydro-electric / tidal / wave / solar / wind / nuclear;	**1**
1(f)(i)	*allow answer within range* 75–80;	**1**
1(f)(ii)	*any one from:* electricity not used from grid or generated on land; boats do not use (much) electricity; boats use engines or fuel (rather than mains electricity); only small amount of electricity is used to handle nets; Iceland is cold enough not to use (much) refrigeration;	**1**

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Question	Answer	Marks
1(g)(i)	*any two from:* supply of (fresh) water (from lake / river); water can be used, for HEP / to generate electricity; transport / roads / easy to get to and from; town could supply workers;	**2**
1(g)(ii)	*any two suitable questions related to expanding the aluminium industry written in a similar style, e.g.* Do you think the smelter / aluminium industry, will impact on the environment? Do you think the smelter / aluminium industry, will impact on people? Do you think the smelter / aluminium industry, will affect agriculture? Do you think the smelter / aluminium industry, will affect tourism? Do you think the location is suitable for the smelter? Are you in favour of the smelter / the aluminium industry?	**2**
1(g)(iii)	*any three from:* sampled people do not live in Iceland; the people are not familiar with Iceland; biased / have vested interest; did not use random or systematic sampling / not representative of population / only asked, workers / people living in China;	**3**
1(g)(iv)	(because 50 m sample is) closest sample point to smelter;	**1**
1(g)(v)	yes **AND** safe level for goats is 50 mg per kg, which is above crop level of 29 mg per kg;	**1**

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Question	Answer	Marks
1(h)(i)	*any two from:* loss of habitat / loss of biodiversity; noise pollution; water pollution; land pollution; air pollution; visual pollution; waste disposal; employment opportunities; improvements in local or national economy; improvements in facilities and infrastructure;	**2**
1(h)(ii)	*any two from:* limited demand / supply too great; (so) price of aluminium falls; (so) not economical to extract / company would not profit; licences / permits, needed to extract / local laws;	**2**
1(h)(iii)	*any three from:* filling in the hole with, waste / overburden; topsoil added; soil improvement, e.g. add fertiliser; bioremediation (to remove pollutants); vegetation planted / tree planting / make into a nature reserve; water can be used to fill hole / make into a reservoir or lake;	**3**

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Question	Answer	Marks
2(a)(i)	*two arrows drawn moving apart*;	**1**
2(a)(ii)	*any two from:* magma rises; lava flows out (onto sea floor); lava, solidifies / is cooled (by the water); (solid) rock, builds-up / forms an island;	**2**
2(a)(iii)	*any three from:* people not allowed to visit / it's a protected area / people don't live there; no species are introduced by people / only natural colonisation; (isolated as) surrounded by sea / protected marine area / buffer zone; started from bare rock / no species on the island when it formed;	**3**
2(b)	*any four from:* reduced visibility for flying; damage planes (engines); dangerous to fly; air in planes could, become a health risk / aggravate lungs / aggravate asthma; affects many countries / wind carries ash cloud (long distances); (eruption) went on for a long time;	**4**
2(c)(i)	successful **AND** no deaths in modern times;	**1**
2(c)(ii)	*any three from:* mining industry / extraction of minerals, e.g. sulfur / employment in mining; geothermal energy; tourism / employment in tourism; fertile soil (for growing crops) / employment in agriculture; high(er), yields / incomes for farmers; scientific research;	**3**

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Question	Answer	Marks
2(d)	*any four from:* winds carry this long distances; SO_2 dissolves or reacts with water; (forms) acid rain / precipitates out in rain; lower pH (of rain / lakes / rivers / groundwater / soil) / forms sulfurous acid / sulfuric acid; kills aquatic life; kills or reduces growth of, trees / crops / plants / vegetation / defoliation; erodes rock;	**4**

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Question	Answer	Marks
3(a)(i)	*any three from:* removal of trees, exposes soil / bare soil; tree roots, bind / act as anchor for soil; (soil is easily) washed away by rainfall / increased surface run-off; (soil) blown away by wind; forest canopy, protects soil / allows interception;	**3**
3(a)(ii)	*any two from:* terracing hillsides into steps removes slopes and prevents run off, a bank stops soil being washed away; contour ploughing (around slope instead of up and down) slows down run off and helps retain soil (on slopes); bunds create a barrier (out of soil / stones) to prevent soil being washed or blown away; wind breaks using, hedges / trees / walls can, prevent / slow soil being blown away; addition of organic matter gives better soil structure, improving water infiltration and preventing soil erosion;	**2**
3(a)(iii)	*any three from:* sustainable forestry / agroforestry / extractive reserves / sustainable harvesting (of wild plants or animal species); wildlife / ecological / nature, reserves or corridors / national parks; seed / gene, banks; zoos / captive breeding; sustainable tourism / ecotourism; legal protection, e.g. rules / laws; enforcement of rules, e.g. park rangers, fines, patrols;	**3**
3(b)	*any four from:* *agree with statement because:* (Alaskan lupine plant) reduces soil erosion / (root structure) binds soil / (root structure) creates an anchor; which improves soil, quality / drainage / aeration; better than other plants as not eaten by grazing animals; reduces dust storms so reduces road closures; *disagree with statement because:* (Alaskan lupine plant) competes with native plants / reduces biodiversity / is an invasive species; (Alaskan lupine plant) is not controlled by grazing (as bitter taste); less grazing land (available); cannot be used to feed animals / risk of malnutrition in animals / animals less productive;	**4**

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Question	Answer	Marks
3(c)(i)	1; 14;	**2**
3(c)(ii)	*6 represented as a tally in the table*;	**1**
3(c)(iii)	(region) 8;	**1**
3(c)(iv)	120;	**1**
3(c)(v)	*any three reasons for **not** agreeing with the conclusion from:* too small a sample size / not enough evidence to support this conclusion; no pattern (in data); only one sample in, north east of field / region 27; the number of plants are approximately the same in all regions of the field; higher number in, west / region 8; experiment did not look at conditions or biotic or abiotic factors;	**3**
3(c)(vi)	*any one from:* increases validity; one field might not be representative; to check for anomalous results; different parts of Iceland will have different numbers of plants; parts of Iceland are covered with, glacier / rock;	**1**

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