Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

ENVIRONMENTAL MANAGEMENT **0680/23**

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)	*any three from:* no roads through the centre; coast is easy to access by boat; central area is unused land / coastal area is used for agriculture; central area has, glaciers / permanent ice and snow; coast has fishing ports; economic area or employment associated with the sea or coast / imports and exports by sea;	**3**
1(a)(ii)	*allow answer within range* 167 000–168 000;	**1**
1(b)	*any three from:* overall decrease / fluctuation; increase 1952–1956; highest rate in 1956; then decrease to 1969; fluctuates 1969–2004; decrease from 2009 to 2015; lowest rate 2015;	**3**
1(c)(i)	July;	**1**
1(c)(ii)	5(.0);	**1**
1(c)(iii)	*any three from:* ground will freeze / temperature below zero (in winter / 5 months year); soil becomes water logged; food crops / grass, can't grow / die; lack of, quality / quantity of food; limits stocking rate or production; animals would need to be moved inside; disposal of animal waste (from housing inside);	**3**

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Question	Answer	Marks
1(d)(i)	*any three from:* heated soil optimum temperature for growth; heat from soil warms the air; artificial light used as photosynthesis requires light; carbon dioxide used for photosynthesis / used for production of glucose or food for plants; photosynthesis equation, e.g. carbon dioxide + water → oxygen + glucose;	**3**
1(d)(ii)	*any four from:* cold water pumped underground; hot (ground)water from, rock cracks / volcanic areas / radioactive isotopes; hot water pumped from ground; hot water pumped around the greenhouse / used in radiators or underfloor heating; hot water warms, soil / air;	**4**
1(d)(iii)	fossil fuel / coal / oil / (natural) gas;	**1**
1(d)(iv)	*any three from:* waste products radioactive; risk of radiation related health issue; danger of, accidents / leaks; visual pollution; increased traffic;	**3**
1(e)(i)	9.0% and 3.0% correctly plotted; key completed and segments match for both ferrosilicon industry and domestic;	**2**
1(e)(ii)	*any one from:* electricity consumption / graph, doesn't give any information about, size / importance, of industry; doesn't give you value or economic worth of product;	**1**

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Question	Answer	Marks
1(e)(iii)	*any three from:* insulation; double / triple, glazing; turning off electrical devices; using energy efficient devices; education on energy conservation; financial incentives; use renewable energy;	**3**
1(f)(i)	*any two from:* roads / transport at **B**; accessible water supply at **B**; availability of workers (in town) at **B**;	**2**
1(f)(ii)	*any two from:* questions are, open ended / free response / not yes no answers; answers will not be able to be quantified; the questions are unclear;	**2**
1(f)(iii)	*any one from:* random sampling / method where equal chances of everyone in target population being picked; systematic sampling / method where every Nth name is selected from target population;	**1**
1(f)(iv)	*any three from:* vegetation cleared in surface mining / loss of habitats / loss of biodiversity; larger area of land is used in surface mining (than subsurface mining) / visual pollution; overburden / soil and rock, needs to be removed; more noise; more dust;	**3**
1(f)(v)	recycle / re-purpose / reuse;	**1**
1(g)(i)	<table><tr><td>**D** (*given*)</td><td>**A**</td><td>**C**</td><td>**B**</td></tr></table> ;	**1**

Question	Answer	Marks
1(g)(ii)	no because safe level for cattle is 30 mg per kg which is below the crop level at **D** or below 32 mg per kg; safe at **A B C** as level here is lower than 30 mg per kg;	**2**
2(a)(i)	*any two from:* (plates move apart / constructive boundary) magma fills the gap; magma cools; (magma) solidifies to form (new) rock; process is ongoing / ridge is growing / plates still moving apart;	**2**
2(a)(ii)	centered on the ridge / at plate boundary / in same places as volcanoes / where plate boundary splits;	**1**
2(b)	*any three from:* national park / biosphere reserve; create, marine exclusion zone / buffer zones; stop people going there / limit / ban, tourism / sustainable / ecotourism; international agreements; legislation / laws / fines (to stop people going there); patrol the boundaries / enforcement officers;	**3**
2(c)(i)	*any two from:* ash in sky reduced visibility; ash damages planes; ash on runways / planes couldn't take off;	**2**

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Question	Answer	Marks
2(c)(ii)	*any two from:* *ash:* plants get covered in ash / can't grow / limited growth; ash blocks out light / plants can't photosynthesis; *flooding:* waterlogged soil; crops washed away; *leads to:* harvest will fail; harder for livestock to, find food / graze;	**2**
2(c)(iii)	eruption happened in the south or was 300 km away; ash cloud travelled south(east) / wind direction blew it south(east);	**2**
2(c)(iv)	*both benefits and limitations must be covered for maximum credit:* *maximum three from, benefits:* alerted quickly; can save lives; gives people a chance to evacuate; (sent in different languages) so people can understand the message; it is established / well-rehearsed / practiced / pre-planned; *maximum three from, limitations:* depends on people understanding one of the three languages; depends on having a phone or working phone; tourists may not have practiced the plan or know about the mobile (cell) system;	**4**
2(c)(v)	*any one from:* (analysed for) dust / particles / ash layer / sulfates (from eruption); to find out when an eruption occurred;	**1**

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Question	Answer	Marks
2(d)(i)	*any two from:* the VEI value, of many / 24, of the eruptions is unknown; most less than VEI 2; most eruptions did not spread a lot of ash; quoted data, e.g. only 3 eruptions had VEI value of 3–8 / none above VEI of 6 / none at VEI 5, 7 or 8;	**2**
2(d)(ii)	*any two from:* not recorded; happened before records started; the eruption was over very quickly;	**2**
3(a)(i)	*any two from:* (trees cut down for) building materials / timber / fuel; land cleared for agriculture / settlements / roads / homes; areas mined for, rocks / minerals;	**2**
3(a)(ii)	*any three from:* habitat loss; desertification; food chains disrupted / loss of biodiversity; genetic depletion; loss of, food / crops; loss of (potential) source of medicine;	**3**
3(a)(iii)	*any two from:* agroforestry; ecotourism; afforestation; reforestation; education on importance of forests; forest reserves; selective logging / monitoring of existing logging; legislation and regulations;	**2**

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Question	Answer	Marks
3(b)(i)	*any two from:* improves the fertility of soil; allows other plants to grow (better); as plants need mineral ions or nitrate to grow; increases (future) agricultural yield; plants more likely to, seed / complete life cycle; less artificial fertiliser needed / part of organic farming;	**2**
3(b)(ii)	*any four from:* *disagree with statement because:* (Alaskan lupine plants) die out after 20 years; improve the soil composition; allow other species of colonise; biodiversity increases; *agree with statement because*: (Alaskan lupine plants) compete with native plants or bilberry; (lupines shade as) reduces growth / reduces photosynthesis / reduces number, of native plants; lupines, widespread / have spread to many areas / not died out (in all areas); (leaves are bitter) not eaten by animals / no natural control / cannot be used for pastoral farming;	**4**
3(b)(iii)	*any five from:* position quadrat, along transect / at random / systematically / using a grid (to determine the location of the quadrats); use stated size of quadrat between 0.25 m^2 – 1 m^2; take repeated quadrat readings; count all the lupines in the quadrat / estimate (percentage) coverage of lupines; determine the area of a field; calculate the average number of lupines per quadrat or unit area; multiply by area of field; record results in a suitable format, e.g. table or tally (chart);	**5**

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