Cambridge Assessment International Education

Cambridge IGCSE™

ENVIRONMENTAL MANAGEMENT **0680/13**

Paper 1 Theory **October/November 2021**

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.

Cambridge International is publishing the mark schemes for the October/November 2021 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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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.

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.

Science-Specific Marking Principles

1	Examiners should consider the context and scientific use of any keywords when awarding marks. Although keywords may be present, marks should not be awarded if the keywords are used incorrectly.
2	The examiner should not choose between contradictory statements given in the same question part, and credit should not be awarded for any correct statement that is contradicted within the same question part. Wrong science that is irrelevant to the question should be ignored.
3	Although spellings do not have to be correct, spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. ethane / ethene, glucagon / glycogen, refraction / reflection).
4	The error carried forward (ecf) principle should be applied, where appropriate. If an incorrect answer is subsequently used in a scientifically correct way, the candidate should be awarded these subsequent marking points. Further guidance will be included in the mark scheme where necessary and any exceptions to this general principle will be noted.
5	‘List rule’ guidance For questions that require ***n*** responses (e.g. State **two** reasons …): • The response should be read as continuous prose, even when numbered answer spaces are provided. • Any response marked *ignore* in the mark scheme should not count towards ***n***. • Incorrect responses should not be awarded credit but will still count towards ***n***. • Read the entire response to check for any responses that contradict those that would otherwise be credited. Credit should **not** be awarded for any responses that are contradicted within the rest of the response. Where two responses contradict one another, this should be treated as a single incorrect response. • Non-contradictory responses after the first ***n*** responses may be ignored even if they include incorrect science.

6 Calculation specific guidance

Correct answers to calculations should be given full credit even if there is no working or incorrect working, **unless** the question states 'show your working'.

For questions in which the number of significant figures required is not stated, credit should be awarded for correct answers when rounded by the examiner to the number of significant figures given in the mark scheme. This may not apply to measured values.

For answers given in standard form (e.g. $a \times 10^n$) in which the convention of restricting the value of the coefficient (a) to a value between 1 and 10 is not followed, credit may still be awarded if the answer can be converted to the answer given in the mark scheme.

Unless a separate mark is given for a unit, a missing or incorrect unit will normally mean that the final calculation mark is not awarded. Exceptions to this general principle will be noted in the mark scheme.

7 Guidance for chemical equations

Multiples / fractions of coefficients used in chemical equations are acceptable unless stated otherwise in the mark scheme.

State symbols given in an equation should be ignored unless asked for in the question or stated otherwise in the mark scheme.

Question	Answer	Marks
1(a)	*any three from:* convection currents move plates; two plates moving away from each other / divergent; molten magma rises to fill the gap; magma becomes lava; underwater mountains / volcanoes / new land formed / sea floor spreading; shield volcanoes can form along the edge of the boundary;	**3**
1(b)	*any three from:* damage to buildings and infrastructure; fire; tsunamis; landslides; loss of land / habitats; water related disease; loss of life; trauma; financial losses; homelessness / relocation / evacuation (of people);	**3**

Question	Answer	Marks
2(a)(i)	pronatalist;	**1**
2(a)(ii)	*any two from:* tax advantages; free schooling; subsidised housing; social reward, e.g. medal; free / subsidised healthcare for families; AVP;	**2**

Question	Answer	Marks
2(b)	*any two from:* availability of medicine / vaccines; availability of health care / doctors / hospitals; availability of clean / safe water; availability of food; lower infant mortality; better / lesser resourced – qualified;	**2**

Question	Answer	Marks
3(a)	chlorofluorocarbons / CFCs;	**1**
3(b)	*any one from:* skin cancer; cataracts;	**1**
3(c)	*any one from plus one description:* international agreement and policies; so unified / coordinated approach; CFC replacement / banning; so less emissions; taxation; encourages the change to better solutions;	**2**

Question	Answer	Marks
4(a)	*any two from:* net types, e.g. (larger) mesh size / mesh shape; introduce / reduce quotas; closed seasons; protected areas / reserves; conservation laws; international agreements;	**2**
4(b)(i)	*any two from:* better able to meet demand; consistent supply / controlled; easier to control predators / disease; more profitable; provides cheap protein; employment; easier / more efficient / safer to catch; no bycatch;	**2**
4(b)(ii)	*any one from:* water pollution / effluent; increase risk of disease (due to stock density); (increased) use of antibiotics required / risk of antibiotic resistance; possibility of escape;	**1**

Question	Answer	Marks
5(a)(i)	sandy;	**1**
5(a)(ii)	*any two from:* (sandy because): larger particles; bigger air spaces / porous and permeable; which hold more water when wet / which drain more freely; sandy has less water content so has drained more freely;	**2**

Question	Answer	Marks
5(a)(iii)	*any two from:* increase microorganisms / biotic content; increase water holding capacity; increases air spaces (in heavy soils); more nutrients / fertile; so less expenditure on other fertilisers;	**2**
5(b)(i)	potassium (ions);	**1**
5(b)(ii)	(20 ÷ 100 × 50 =) 10 (kg);	**1**
5(b)(iii)	*any two from:* different soils deficient in different minerals; different crops require different minerals; avoid nutrient enrichment / eutrophication / ban on certain ratios; AVP;	**2**

Question	Answer	Marks
6(a)	vector; female; parasite; human;	**4**

Question	Answer	Marks
6(b)	*any two strategies described, e.g.:* eradicate / kill mosquitoes by; using insecticide; using larvae-eating fish; prevent bites by; wearing long clothes / covering skin; using nets; using repellent; using screens for windows / doors; prevent breeding by; releasing sterilised males; putting oil on water surfaces; kill malaria parasite; using anti-malarial drugs;	**4**
6(c)	*conclusion based on* developed *evidence:* (yes because) draining swamps reduces the number of breeding sites; mosquitoes need water to breed / to complete life cycle; (no because) mosquitoes can still breed in reservoirs; cannot drain these as needed as source of water / power / food; (no because) mosquitoes can still breed in paddy fields; we cannot drain these as they are needed for food; (no because) draining swamps is expensive and difficult to do; other control methods may be easier / cheaper / more effective;	**4**

Question	Answer	Marks
7(a)(i)	bar line correctly completed at 31%;	**1**
7(a)(ii)	26 500(.23);	**1**
7(a)(iii)	*any three from:* climate change / getting hotter / getting wetter / getting drier; vegetation changes; sea levels rise; acid rain; disease / epidemic; spread of invasive species; increased human population; destruction of habitats; pollution; hunting / poaching;	**3**
7(a)(iv)	*any two from:* breeding programs; maintaining genetic diversity; education; reintroduction; funding conservation / research; veterinary assistance / training / support; prevents predation / hunting;	**2**
7(b)(i)	*any three from:* (north) Asia; Canada / north of North America; east / west sides of North America; south of North America; north of South America; central Africa; Indonesian islands; Japan; AVP;	**3**

Question	Answer	Marks
7(b)(ii)	*any two from:* (leaves) reduce interception; (leaves) reduce force of wind / wind speed; roots hold soil; reduce run-off;	**2**
7(b)(iii)	*any two from:* increasing human population; (which means increased): timber extraction and logging; farming; roads; settlements; mining / rock / mineral extraction;	**2**

Question	Answer	Marks
8(a)	sensible linear scale for *y*-axis using at least half the graph paper; *y*-axis – energy consumption / MTOE; *x*-axis – resource; bar plots;	**4**
8(b)(i)	388.8;	**1**
8(b)(ii)	*any two from:* change / decrease in population; better insulation; more efficient devices used; change in climate / getting warmer; fuel is more expensive;	**2**

Question	Answer	Marks
8(b)(iii)	*any two from:* no new nuclear power stations built; nuclear power stations take a long time to build; nuclear powers stations are costly to build; change in government policy; public opinion;	**2**
8(c)	*any two from:* rich / higher standard of living; meaning more electrical devices / domestic / white goods; more infrastructure; greater demand; greater supply; high level of development;	**2**

Question	Answer	Marks
9(a)(i)	7.75;	**1**
9(a)(ii)	*any two from:* to conserve resources (for future generations); amount of resources are finite; finding more resources has: environmental impact; financial impact; social impacts;	**2**

Question	Answer	Marks
9(a)(iii)	*any three from:* increased efficiency in the extraction of minerals; increased efficiency in the use of minerals; recycling of minerals; use other alternatives (if suitable); laws / legislation / rules; reducing outputs / waste; reducing inputs / energy / water; reducing footprint / infrastructure;	**3**
9(a)(iv)	*any two from:* land restoration; soil improvement; bioremediation; tree planting; making lakes and nature reserves; using as landfill sites;	**2**

Question	Answer	Marks
9(b)	*Level of response marked question:* Level 3 [5–6 marks] **A coherent response is given that develops and supports the candidate's conclusion using relevant details and examples.** Indicative content and subject-specific vocabulary are generally used precisely and accurately. Good responses are likely to present a balanced evaluation of the statement. Level 2 [3–4 marks] **Development and support of the conclusion is evident, though the response may lack some coherence and / or detail.** Irrelevant detail may be present. Indicative content and subject-specific vocabulary are used but may lack some precision and / or accuracy. Responses contain evaluation of the statement, but this may not be balanced. Level 1 [1–2 marks] **The response may be limited in development and / or support.** Contradictions and / or irrelevant detail may be present. Indicative content and subject-specific vocabulary may be limited or absent. Responses may lack structure or be in the form of a list. Evaluation may be limited or absent. No response or no creditable response [0 marks]	**6**

Question	Answer	Marks
9(b)	*Indicative content for:* Some people in my village are unhappy about the quarry being opened, but I think everybody should be pleased there is going to be a new quarry. *reasons to be pleased:* employment; improvement to infrastructure, e.g. power supplies roads etc.; improvement to facilities, e.g. improved transport; economy of the town / more money spent in the town; provide a source of energy for cooking / heating; provide materials for building; opportunities to supply the mine / workers with services; *reasons to be unhappy:* pollution / dust can cause health problems; visual pollution from spoil heaps; noise from quarry and transport; road congestion from transport; damage to environment; deforestation; loss of farmland; need to relocate homes; loss of existing jobs; mineral extraction is dangerous; insufficient accommodation for influx of workers resulting in informal settlements;	