Cambridge Assessment International Education

Cambridge IGCSE™

ENVIRONMENTAL MANAGEMENT **0680/11**

Paper 1 Theory **October/November 2020**

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 2020 series for most Cambridge IGCSE, Cambridge International A and AS Level and Cambridge Pre-U 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.

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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.

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.

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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.

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Question	Answer	Marks
1(a)	*any three in a correct order:* (weathering / erosion of) existing / surface rocks ; accumulation / transportation of, (mineral) particles / fragments (by water / rivers / streams); burial / deposition / sedimentation, of particles <u>in layers</u> (in lakes / seas); <u>heat and pressure</u> causes, compaction / cementation, of layers (of minerals / particles / sediment) into rocks;	**3**
1(b)	*any three from:* loss of farmland; loss of industry; loss of tourism; noise pollution; visual pollution; air pollution / dust; land contamination; water pollution; increased traffic; may need to relocate;	**3**

Question	Answer	Marks
2(a)	solar (power / farm);	**1**
2(b)	*any one advantage from:* renewable resource / not finite; less atmospheric pollution / green energy / no CO_2 / no greenhouse gases / no contribution to global warming; lower running costs (once installed); lower maintenance; less waste; *any one disadvantage from:* weather-dependent / work less well in low-light levels; do not work at night; more visual pollution; more loss of land for, farming / other uses;	**2**

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Question	Answer	Marks
2(c)	*any two from:* use insulation / reduce heating; increase number of windows to reduce lighting costs; turn electrical devices off when not in use; use / buy, energy-efficient devices; use devices more efficiently;	**2**

Question	Answer	Marks
3(a)	*any three from:* (to achieve) higher wages; (to improve) career opportunities / employment opportunities; (to achieve) a higher standard of living / more wealth; (to benefit from) lower taxes; (for reduced) cost of services, e.g. education, health care; (for improved) national economic stability, qualified, e.g. lower inflation;	**3**
3(b)	for a different climate / to move away from a named natural disaster, e.g. drought, flooding, volcano, forest fires;	**1**

Question	Answer	Marks
4(a)	*any two from:* removal of natural vegetation / deforestation; overcultivation; overgrazing; water / rainfall / flood / rivers; land relief / steep slopes;	**2**
4(b)	*any one from:* desertification; silting of rivers; loss of, habitat / biodiversity; displacement of, people / animals; malnutrition / famine;	**1**

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Question	Answer	Marks
4(c)	*any two from:* wind breaks; maintaining vegetation cover / intercropping; addition of organic matter to improve soil structure; planting trees;	**2**

Question	Answer	Marks
5(a)(i)	**X** mesosphere; **Y** stratosphere;	**2**
5(a)(ii)	idea of, increase in acidity / acidifying / acidification / lower pH of, bodies of water / soil; *plus max two from:* stated effect on aquatic organisms, e.g. decrease in fish populations; stated effect on land organisms, e.g. damage to crops and vegetation; additional stated effect, e.g. damage to buildings;	**3**
5(b)(i)	*(list rule applied)* USA **AND** Japan **AND** Germany;	**1**
5(b)(ii)	(difference, 8.3 – 7.5 =) 0.8; (percentage increase, 0.8 ÷ 7.5 × 100) = 11 / 10.7 / 10.6(67) (%);	**2**
5(b)(iii)	*any two from:* not all countries are shown / data is not representative; data is per person / population data is not given; 2030 is only a prediction; unknown future factors may affect CO_2 concentrations / example of future factor given;	**2**

Question	Answer	Marks
5(c)	no physical borders in atmosphere / wind blows pollution (around world); so lack of international agreement is a problem; *max two from:* idea that some effects of atmospheric pollution are global; sea level rise from global warming; climate change affecting all weather systems in world; idea of effect being distanced from the source of the pollution; acid rain can be caused by pollution in other countries; ozone depletion areas occur in specific regions;	**3**

Question	Answer	Marks
6(a)	*any three from:* low pressure, warm and wet: causes rising moist air; warm air can hold more water (vapour); high levels of rainfall; possible formation of, cyclones / storms; can lead to storm surges; causes sea level to rise; wind direction east to west: winds blow rain / storm surges, onto land / onshore; wind comes from sea and carries lots of water vapour; sea level is high: storm surge / cyclone effects, more severe / extreme; chances of flooding increased;	**3**
6(b)(i)	*any three from:* location is between 5° and 20° North and South of Equator; ocean surface temperature of at least 27°C; ocean depth of at least 60 m; increased chance of formation due to, El Niño / climate change;	**3**

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Question	Answer	Marks
6(b)(ii)	*any three from:* monitoring **AND** warning; improved structure of buildings; fast evacuation; disaster preparation plans/drills; availability / preparation, of, emergency supplies / rescue teams; availability / preparation, of shelters; rebuilding of damaged areas; international aid; building flood defences;	**3**

Question	Answer	Marks
7(a)(i)	24.5 bar correctly completed;	**1**
7(a)(ii)	*any one from:* (Japan is an) MEDC; money invested in infrastructure; piped water supply; industrialised / urbanised, country;	**1**
7(b)	1.5, 1.5, 1.6;	**1**

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Question	Answer	Marks
7(c)	*any four from:* flooding / loss, of land; displacement of, people / wildlife; noise pollution; destruction of biodiversity; downstream effect; tourism / recreational use; irrigation; fishing; creation of jobs; source of, electricity / HEP; reducing / managing, flooding; development of, roads / infrastructure;	**4**
7(d)	*any two from:* (insecticides are) toxic; build-up of insecticide in aquatic life / bioaccumulation ; impact on food chain / death of insects; leading to death of other aquatic life;	**2**

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Question	Answer	Marks
7(e)	*max five marks for points made from student comment bubbles:* *<u>effective:</u>* produces large amounts of, good-quality / potable, water; continuous supply of sea water; 97% of water on earth is in sea and oceans; *<u>not effective:</u>* plants are expensive to, build / run; process uses a lot of energy; fresh water produced is expensive to buy; do not know what future, costs / availability, will be; harmful to environment; produces a lot of salt waste (which is put back into the sea); other harmful chemicals such as chlorine are involved; *plus max five marks for candidate's own valid points, e.g.:* *<u>additional examples of effective</u>:* safe (qualified), e.g. no high levels of heavy metals, water pollution; reduces risk of water-related diseases (qualified), e.g. malaria from mosquitoes breeding in standing water; provides jobs; can be used when no other water sources available ; 3% of other water often inaccessible (underground, frozen); water does not need to be treated further; established technology; *<u>additional examples of not effective</u>:* damage to marine ecosystems (due to waste salt); only economically viable for coastal areas / transportation costs of (salt / fresh) water; can only be implemented in wealthy countries;	**7**

Question	Answer	Marks
8(a)(i)	11.8;	**1**
8(a)(ii)	axis labels and units; sensible linear scale that uses over half the plotting space; bars correctly plotted; bars for different years clearly identified, e.g. key added;	**4**
8(a)(iii)	overall trend identified: increase (in mass of farmed fish between 2010 and 2015) for <u>all</u> countries; other correct trend identified, e.g. Madagascar greatest increase / Portugal smallest increase;	**2**
8(b)	*any two from:* change / increase, in demand; greater uptake of fish farming worldwide; shortage of wild stock; disease; better technology (for farming fish); government, investment / restrictions; ethical reasons / public pressure; more, fish farms / aquaculture;	**2**

Question	Answer	Marks
9(a)	table drawn; column / row, headings with units; three sets of data recorded correctly; country / area of forest / km^2 Russia(n Federation) / 8 149 300 Brazil / 5 173 689 Canada / 4 916 438	**3**

Question	Answer	Marks
9(b)(i)	the, variety / range / different types / number, of <u>different</u>, organisms / species / life, in a (particular), habitat / ecosystem / environment ;	**1**
9(b)(ii)	*(list rule applied)* pitfall trap / pooter / quadrat / transect;	**1**
9(b)(iii)	biotic / abiotic, factor / example, stated; different biotic / abiotic, factor / example, stated;	**2**
9(c)	*Level of response marked question:* <u>Level 3</u> [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. <u>Level 2</u> [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. <u>Level 1</u> [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. Responses may lack structure or be in the form of a list. Evaluation may be limited or absent. <u>No response or no creditable response</u> [0 marks]	**6**

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Question	Answer	Marks
9(c)	*Indicative content for:* *'The reasons for cutting down trees are more important than the problems caused by deforestation.'* *reasons for cutting down trees:* clearance for dwellings clearance for land to, grow crops / raise livestock provide a source of income provide a source of energy for, cooking / heating provide materials for building timber extraction and logging, subsistence and commercial farming, roads and settlements, rock and mineral extraction *problems caused by deforestation:* impacts: habitat loss, soil erosion and desertification, climate change, loss of biodiversity and genetic depletion growing forests act as carbon sinks and mature forests act as carbon stores link to, role in water cycle, prevention of soil erosion, biodiversity as a genetic resource, food, medicine and industrial raw materials, ecotourism strategies for managing deforestation: sustainable harvesting of wild plant and animal species, sustainable forestry / agroforestry, national parks, wildlife / ecological reserves and corridors, extractive reserves, world biosphere reserves, seed banks, sustainable tourism and ecotourism	

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