Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

ENVIRONMENTAL MANAGEMENT **0680/12**

Paper 1 Theory **March 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.

Cambridge International is publishing the mark schemes for the March 2019 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.

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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)	(surface) run-off;	**1**
1(b)	*any four from:* Sun heats Earth('s surface) / source of energy is from the Sun; water is evaporated from, oceans / rivers / lakes; water evaporates from plants or leaves or trees / water (vapour) is lost from plants or leaves; warm air or less dense air, rises; condensation (as water vapour) cools / condensation (of water vapour) into (water) droplets or named precipitation / water or vapour cools / clouds form; (named) precipitation when water droplets get bigger or heavier;	**4**

Question	Answer	Marks
2(a)	*from top of page down:* thermosphere; mesosphere; stratosphere; troposphere; *4 correct [3]* *2–3 correct [2]* *1 correct [1]*	**3**
2(b)	*any two from:* higher levels of UV or ultraviolet (radiation reaching Earth); (increased rate of) skin cancer; cataracts; damage to vegetation; increased mutations;	**2**

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Question	Answer	Marks
3(a)	*any two from:* family planning / named method; availability / choice / affordability, of contraception; improved health; improved education (of men and / or women); national population policies / antinatalist policy / named national policy, e.g. one or two child policy;	**2**
3(b)(i)	*any one from:* provides, essential nutrients or minerals / named elements, N P K / named compounds, nitrates, phosphate, potassium (for plant growth); increases the rate or growth (of crops);	**1**
3(b)(ii)	*any three from:* leaching / run-off / nutrients get into rivers; nutrient enrichment / eutrophication; *idea of* increased algal growth / algal bloom; sunlight blocked; reduces photosynthesis; algae die or decay or decomposed; decomposition / decomposers / bacteria, uses up oxygen; aquatic life dies (due to lack of oxygen);	**3**

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Question	Answer	Marks
4(a)	*any two from:* no or limited carbon dioxide emissions (at point of use); does not cause global warming (at point of use); does not cause acid rain / no SOx or NOx emissions (at point of use); small amount of fuel produces large amount of energy; uses less raw materials;	**2**
4(b)	*any two from:* reduction in heat loss, e.g. insulation / double glazing / triple glazing; turn off electrical devices / do not use stand-by or sleep mode / limit time using electrical devices; use energy efficient devices; use alternative or renewable energy sources; heat recovery schemes; improve natural light; better natural ventilation (rather than air conditioning); ICT control of the living environment, e.g. smart devices;	**2**

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Question	Answer	Marks
5(a)	*category*: 4 **AND** *reason:* winds reached 230 km / h or (within range of) 209–251 km / h;	**1**
5(b)(i)	*no clear strategy or ineffective strategy based on any six evidence:* regular hurricanes in area / hurricanes should have been expected; lack of disaster preparation or planning; limited food and water after the hurricane; mobile phone network failed / no communication; no, electricity / power; no (previous) early warning or monitoring system / monitoring system now in place; long wait for aid or help after the hurricane; country had limited money to help / help came from, international aid / charity support;	**6**
5(b)(ii)	*any three from:* (increased risk of) bacteria(l) disease / bacteria entering water / named bacterial disease, e.g. typhoid / cholera; (increased risk of standing water leading to) parasitic disease / named parasitic disease, e.g. malaria; dehydration; large numbers of people living in the open or in shelters; lack of adequate sanitation; drinking water contamination (by flood or brown water or human or animal waste); no money to repair infrastructure; limited access to medical care facilities;	**3**
5(c)	*any three from:* (initial) food shortage; longer term lack of food / famine; malnutrition / illness / disease; lag between planting new crops and yield; will need to import or buy food / price of food increases; high level of poverty / unemployment / income loss; leading to migration;	**3**

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Question	Answer	Marks
5(d)	*any two from:* confidence in, prediction / early warning systems / disaster prevention measures; poverty / too poor to move / housing or land is cheap; nowhere else to go / no other options; family connections; job choice; (after flooding) silting improves soil / nutrients added to soil;	**2**

Question	Answer	Marks
6(a)(i)	open-pit / opencast / open-cut / strip (mining) / surface (mining);	**1**
6(a)(ii)	(tungsten is) close to or on the surface;	**1**
6(b)	*any three from:* loss of habitat; loss of biodiversity; loss of farmland; loss of homes; noise / water / land / air / visual / dust, pollution; management of waste / run-off / leaching (into water); increase in traffic; reduction in tourism; employment opportunities; improvements in local economy; improvement in facilities and infrastructure;	**3**
6(c)	*any one from:* increased efficiency of extraction; increased efficiency of use; legislation qualified;	**1**
6(d)(i)	electrical or electronic, equipment / components **AND** unwanted or thrown away;	**1**

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Question	Answer	Marks
6(d)(ii)	*any two from:* CFCs **AND** ozone depletion / UV (radiation); burning (plastics) or acidic / toxic / harmful, gases **AND** acid rain / respiratory problems / erosion of buildings; (heavy) metals / mercury / lead / chromium **AND** toxic (to humans / aquatic life) / bioaccumulation; (e-waste or metals in e-waste) are thrown away / are not recycled **AND** need more extraction of minerals or metals / need more mining / depletion of resources;	**2**
6(d)(iii)	*any two from:* take-back systems / recycle e-waste; reuse or repair; e-waste collected from homes; (introduce) legislation / fines;	**2**
6(e)(i)	(8.1(0) / 41.9 × 100 =) 19.3 ;; *(if answer incorrect, allow one mark for 50.0 – 41.9 = 8.1 [1])*;	**2**
6(e)(ii)	table drawn with, column / row headings; unit in Mt or million tonnes; 6 sets of data recorded correctly;	**3**
6(f)(i)	correctly plotted bar at 19.6 kg and 4 squares wide **AND** shaded correctly;	**1**
6(f)(ii)	USA; highest value for e-waste × population / 6800–7100 kg of e-waste;	**2**

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Question	Answer	Marks

7(a)(i)	*any three from:*
	
	warm currents flow from equator;
	cold currents flow from the poles;
	
	North Atlantic:
	mostly warm currents;
	clockwise circulation;
	warm currents flow, north(east) / along North American coast / along north South-American coast;
	warm currents flow west (in tropics);
	cold currents, flow south(west) / along European **AND** African coast;
	
	South Atlantic:
	mostly cold current;
	anticlockwise circulation;
	warm currents flow, south(west) / along South American coast;
	cold currents flow, north / along African coast;
	cold currents flow east in south South-Atlantic;
		3

7(a)(ii)	*any two from:* currents take oil around the world / water cannot be stopped; oil spill has (negative) impact on, ocean ecosystem / birds / marine mammals / coral reefs / beaches; affects tourism in other countries;	**2**
7(a)(iii)	cold current or cold water, brings in nutrients / (nutrient) upwelling; nutrients support large food web;	**2**

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Question	Answer	Marks
7(b)	*opinion based on any four evidence:* as human population increases, species extinction has increased; quoted data on population or total species extinction, e.g. rapid rate increase from 1950 / over 50 000 species extinct / exponential increase; (population increase means) more fish are eaten / demand for fish has increased; leading to, overfishing / fish removed from sea before reproduction; 10% or 0.75 billion people rely on fisheries or sea for food or livelihood; 8 out of 10 largest cities are coastal / half world's population live within 200 km of coast, **AND** many people have easy access to the sea; the data does not give information about fish extinctions / *idea of* data not giving enough information to make a decision;	**4**

Question	Answer	Marks
8(a)(i)	*any one from:* grass → mice → foxes; grass → mice → wolves; grass → mice → owls; grass → deer → wolves; grass → insects →(small) birds → foxes; grass → insects →(small) birds → owls; grass → insects →(small) birds → wolves; grass → (small) birds → owls; grass → (small) birds → foxes; grass → (small) birds → wolves;	**1**
8(a)(ii)	4 / four;	**1**
8(b)(i)	(reactants) carbon dioxide + water; (products) glucose + oxygen;	**2**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>8(b)(ii)</td><td>
<table>
<tr><th>feature of soil</th><th>description of sandy soil</th></tr>
<tr><td>ease of cultivation</td><td>easy</td></tr>
<tr><td>organic content</td><td>poor nutrient retention / low chance for particles to bind mineral ions / more leaching;</td></tr>
<tr><td>water content</td><td>low water-holding capacity;</td></tr>
<tr><td>drainage</td><td>free draining / large air spaces between particles;</td></tr>
</table>
</td><td>3</td></tr>
</table>

Question	Answer	Marks
8(c)	*any one benefit from:* clears land quickly ; makes land available for named use, e.g. urbanisation or homes / farming / industry; clears land for animals to be reintroduced; regeneration; encourages animals when fresh or young plants start to regrow; fire break; kills pests / controls spread of pests; increase in, (short term) soil fertility / nutrient level; *any one negative effect from:* habitat loss / deforestation; loss of crops; soil erosion / desertification; respiratory problems; release of carbon dioxide / climate change; loss of biodiversity / genetic depletion; reduces (long term) soil quality; fire could get out of control;	**2**

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Question	Answer	Marks
8(d)	*Level of response marked question:* Level 3 [5–6 marks] Responses give a clear and detailed description. The response includes the importance of forests **or** effects of deforestation **or** ways of managing forests sustainably. Responses will discuss the global importance of forests. The response will reach a conclusion and may agree or disagree with the statement. The best responses will give a balanced argument, and include specific examples or developed ideas. Level 2 [3–4 marks] Responses include a description but may lack detail or structure. The response includes the importance of forests **or** effects of deforestation **or** ways of managing forests sustainably **or** global importance of forests. The response may agree or disagree with the statement. The best responses will include specific examples or developed ideas or reach a conclusion. Level 1 [1–2 marks] Responses include a brief description or list of the importance of forests **or** effects of deforestation **or** ways of managing forests sustainably **or** global importance of forests. The response may not include a conclusion. Responses may include irrelevant material, repetition or contradictions. Irrelevant or no examples may be given. No response or no creditable response [0]. *Level of response indicative content:* Responses are likely to **agree** with the statement due to the global decrease in forest coverage and problems of deforestation.	**6**

Question	Answer	Marks
8(d)	Responses may consider the **importance of forests** or the **effects of deforestation**. For example, trees acting as carbon sinks and carbon stores, role in the water cycle and preventing soil erosion, or as habitats and link this to biodiversity. Responses may also consider benefits to humans, for example forests providing food, medicine, industrial raw materials and a source of income. Responses may consider how these needs can be met, by discussing ways of **managing forests sustainably**. For example, the possibility of ecotourism, environmental payment schemes, quotas, limits on removal of trees, or replanting schemes. Responses may consider reasons that this is a **global problem** rather than a problem that can be considered at individual country level. For example, world-wide demand for timber and effects of deforestation are global in terms of atmospheric carbon dioxide concentrations and global effect on biodiversity. The best answers may consider the challenges of reaching a global agreement. Some responses may **disagree** with the statement. They may discuss the fact that global deforestation is slowing down and in some areas is being reversed. These responses may focus on human needs, for example for land for housing or farming, and the need for raw materials such as timber. They may suggest that different countries have the right to make their own rules and the idea that differences in the wealth of countries may make this more or less of a priority. The best responses may include specific examples. For example, the sustainable management of areas of the Amazon rainforest / Norway / Costa Rica. Do not expect every aspect to be covered, even for answers in the top level.	

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