Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

ENVIRONMENTAL MANAGEMENT **0680/13**

Paper 1 Theory **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)	all 4 bars correct ;; (*allow one mark for 2–3 bars correct* [1]);	**2**
1(b)	14;	**1**
1(c)	Sub-Saharan Africa;	**1**
1(d)	*any two from:* availability of contraception / lack of education on contraception / lack of education on family planning; many women of child bearing age; tradition of many children / many children as high infant mortality rate / many children to help on farm / care for parents as they age / early marriage; lack of education (for woman); lack of employment opportunities;	**2**
1(e)	*population pyramid sketch is any two from:* straight-sided; narrowing at old age; more females than males at top end;	**2**

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Question	Answer	Marks
2(a)	*any three from:* soil and / or overburden, removed; explosives / blasting of ore; mining down a series of (open), levels / layers; machines / draglines / diggers, remove ore; loaded onto trucks / transported away;	**3**
2(b)	*any three from:* natural vegetation destroyed / deforestation; causing, loss of habitats / reduces biodiversity / impact on food chain; dust in air causing air pollution; water courses polluted from mining run-off; machines cause noise pollution so animals migrate; soil movement causes visual pollution;	**3**

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Question	Answer	Marks
3(a)	both axes labelled including units; sensible linear scale and plotted points uses more than half the grid; 4 or 5 bars correct ;; (*allow one mark for 2–3 bars correct* [1]);	**4**
3(b)	*any two from:* big increase in, plastic production / products made from plastic; lack of recycling / careless disposal of plastics; (plastics are) long lasting / slow to break down; dumped from ships / oceans used as a dump; washed into sea from rivers;	**2**

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Question	Answer	Marks
4(a)(i)	1155×10^{12};	**1**
4(a)(ii)	*any two from:* increase in population; increase in wealth; so more electrical goods, purchased / used; more, houses / industry;	**2**
4(a)(iii)	*in 1984, but **not** in 2014* oil; *in 2014, but **not** in 1984* wind;	**2**
4(a)(iv)	(391 / 180 × 100 =) 217(.2) ;; (*if answer incorrect allow one mark for,* 571 – 180 = 391 [1]);	**2**
4(a)(v)	*any three from:* they do not produce carbon dioxide; which is a greenhouse gas; (international) agreement to decrease greenhouse gas emissions; price of oil has increased; fossil fuels produce gases that cause acid rain; renewable energy technology more available; (have become) more efficient; incentive schemes from governments; change in public awareness / interest, in environmental issues;	**3**
4(a)(vi)	*any two from:* solar; tidal; waves; geothermal; biofuels;	**2**

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Question	Answer	Marks
4(a)(vii)	*any three from:* water from / through, dam; water flows; turns a turbine; which turns the generator (generating electricity);	**3**
4(b)	*opinion based on any five evidence:* *ways of reducing domestic energy use:* insulation; energy efficient devices; switching off devices when not being used; generating own electricity through, e.g. solar, wind; (reducing domestic energy use is) effective if widespread uptake; (however) industry is also a large user of electricity; (industry) uses large machinery; *reducing electricity consumption needs improving by:* promoting energy efficiency; developing renewable resources; recycling to cut fuel costs; using rubbish / waste-oil, to generate electricity; government legislation;	**5**

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Question	Answer	Marks
5(a)(i)	*interception:* precipitation that does not reach the soil, but is instead intercepted by the leaves and branches of plants; *infiltration:* the process by which precipitation / water, soaks into soils; *surface run-off:* water (from rainfall / snowmelt) that flows over the ground;	**3**
5(a)(ii)	*any three from:* increase in population means an increase in demand for food; *so,* increased need for arable land; increased need for grazing land; increased demand for wood; urbanisation; uses (of land), such as mining / HEP / roads / industry / infrastructure;	**3**
5(a)(iii)	*any four from:* fewer plants / roots, to bind soil; with less vegetation more water reaches ground; less vegetation to take water from soil through roots; so more surface run-off; soil dried by the Sun; so blown away by the wind; less vegetation to act as a wind break;	**4**

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Question	Answer	Marks
5(a)(iv)	*Level of response marked question:* Level 3 [5–6 marks] Answers must evaluate other methods of reducing soil erosion and reach a conclusion. Answers will be detailed, rounded and balanced demonstrating a clear explanation of contour ploughing. Level 2 [3–4 marks] Answers may look at both sides of the argument; but with only limited detail. Responses will include a description of contour ploughing. Level 1 [1–2 marks] Answer may well be a list or descriptive rather than an explanation or may provide a basic explanation. More likely they will be one-sided. No response or no creditable response [0]. *Level of response indicative content:* Mark on quality and depth of discussion. There is no one 'correct' answer. Even the best answers will not cover all aspects. The best answers will describe and evaluate contour ploughing as well as look at other ways of reducing soil erosion such as terracing, planting tree crops with ground cover crops underneath, the use of trickle drip irrigation to reduce surface run-off, and the addition of organic matter. Answers may discuss the fact that contour ploughing is only effective if there is a slope and that soil erosion is also caused by wind as well as water.	**6**

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Question	Answer	Marks
5(b)(i)	1 (mm);	**1**
5(b)(ii)	*any two from:* air; water; organic material;	**2**
5(b)(iii)	*any four from:* sandy soils drain more easily / clay soils retain water better; sandy soils contain more / larger, pore spaces / air spaces; clay soils (generally), more fertile / richer in minerals; sandy soils warm up / cool down, more quickly; sandy soils easier to work (than clay soils); texture of soil is different / moist clay soil is sticky whereas moist sandy soil is gritty or loose;	**4**

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Question	Answer	Marks
6(a)(i)	19 (°C);	**1**
6(a)(ii)	*any four from:* heavy rainfall in April; precipitation will fall as snow / ice from Nov – Feb or Mar; temperatures above freezing in, Mar / April; so snow / ice, melts; steep slopes for rapid run-off; valley impedes water flow / no visible lake or river; correct use of data, e.g. rainfall in April is 105 mm;	**4**
6(a)(iii)	*any three from:* homes damaged; forced to evacuate; livestock / crops, damaged; high cost of clear-up; communications / electricity / water supplies, cut-off; comment on health risk / risk of injury / risk of death; disruption to transport in / out, of area;	**3**
6(b)(i)	*allow answer within range* 15–25;	**1**
6(b)(ii)	*any two from:* rapid increase; then decrease; relevant data, such as peak flow volume / time;	**2**
6(b)(iii)	*any three from:* only some water fell directly into river; water takes time to flow into river; much will infiltrate soil, which slows its speed of flow; intercepted by vegetation, which slows down flow; water takes time to flow down river to measuring point;	**3**

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Question	Answer	Marks
6(b)(iv)	*any three from:* dams to hold back water; levees / raised banks, to increase channel size; dredging channel to increase channel size; straightening channel to allow water to flow away quickly; restoring wetlands as natural stores of water / overflow areas upstream; afforestation to increase, interception / take up of water by plants; sewage systems / storm drains with overflows;	**3**

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