Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

ENVIRONMENTAL MANAGEMENT **0680/12**

Paper 12 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)	*allow answer within range* 31–33;	**1**
1(b)	*country* China **AND** *percentage of greenhouse gas emissions allow answer within range* 21–25;	**1**
1(c)	*any two from:* water vapour; carbon dioxide; methane; oxides of nitrogen; CFCs / HCFCs; ozone;	**2**
1(d)	*any three from:* (many) people are poor / poor country / LEDC / developing country; vehicle ownership low / use public transport; electricity not available for many; less ownership of energy-using equipment, e.g. TVs, central heating; limited industry / not as technologically advanced;	**3**

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Question	Answer	Marks
2(a)	along west coast / Chile / Peru; south / south east / east Argentina;	**2**
2(b)	*any two from:* high latitude / long periods of cold weather / low temperature; low population; water frozen / low evaporation / less risk of drought; plentiful, rainfall / precipitation / snow;	**2**
2(c)	*any two from:* large / dense, population; in areas with low rainfall; crops need much irrigation / agricultural use; high water use industries; example of an extravagant use, e.g. swimming pool / car washing;	**2**
2(d)	*any two from:* drought resistant crops; irrigation from, aquifers / wells / rivers / reservoirs / water tanks; building, dams / wells; water conservation, e.g. rainwater harvesting; efficient irrigation techniques, e.g. trickle drip irrigation; growing crops outside of drought season;	**2**

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Question	Answer	Marks
3(a)	cracks / channels / gullies, have developed;	**1**
3(b)	*any two from:* on a slope; water will flow over the slope / surface run-off dislodges soil; wind will sweep across field / no wind breaks dislodges soil; little vegetation to hold soil together / over cultivation / overgrazing / deforestation;	**2**
3(c)	*any two from:* terracing; contour ploughing; bunds; wind breaks; maintaining vegetation cover (all year); addition of organic matter to improve soil structure; planting trees / mixed cropping / intercropping / crop rotation;	**2**

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Question	Answer	Marks
4(a)(i)	*allow answer within range* 4.7–5.1 billion;	**1**
4(a)(ii)	slows / levels off;	**1**
4(a)(iii)	*any two from:* the future can't be certain / hard to predict; birth rates / death rates, may change; catastrophic event may occur, e.g. pandemic / war; population policies / example of; medical advances;	**2**
4(b)(i)	Asia (*largest*) Africa South America Europe North America Oceania (*smallest*) ;; *6 correct [2]* *4–5 in correct order [1]*	**2**
4(b)(ii)	Europe;	**1**
4(b)(iii)	82 ;; (*if answer incorrect allow one mark for,* 71–39 or 32 [1]);	**2**

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Question	Answer	Marks
4(b)(iv)	*any four from:* high birth rate; lack of education for women; lack of contraception / knowledge of contraception; due to, tradition / religion; pronatalist government policies; migration / immigration; falling / low, death rates; due to better sanitation; due to improved health care; due to improved diet;	**4**
4(b)(v)	*any two from:* war / conflict; famine / drought / natural disaster; economic / employment; lifestyle choice / quality of life; family;	**2**

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Question	Answer	Marks
4(b)(vi)	*Level of response marked question:* Level 3 [5–6 marks] A detailed and balanced answer covering an evaluation of education as a strategy and including other strategies. The best answers will include detailed examples. Responses will reach a conclusion that education is important but cannot be the only solution to population size. Level 2 [3–4 marks] Answer will discuss education strategies and may describe other strategies. The response may reach a conclusion but there is a lack of supporting evidence or examples. The response may provide a detailed description of strategies but does not consider a wide range of different strategies. Level 1 [1–2 marks] Basic descriptive points covering education with little or no evaluation. No response or no creditable response [0]. *Level of response marking indicative content:* Many will agree that education is important but may conclude that it is not enough on its own. Candidates may cover the education of women in particular and the fact that education is better in MEDCs than LEDCs. Knowledge of the cost of raising children may be discussed. Good answers will cover other strategies that can be used, such as availability of contraception, family planning clinics and improved healthcare, meaning children are more likely to reach adulthood. Others will cover government strategies (pronatalist or antinatalist) and may give specific examples, e.g. the old antinatalist 'one-child policy' in China, or sterilisation in India, or the pronatalist Singapore policy of three or more children if you can afford it. Education also brings an awareness of the global issues of human population size.	**6**

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Question	Answer	Marks
5(a)	*any three from:* millions of years ago; (coal is formed from) the remains of, trees / plants; (when the plants died,) they settled to the bottom of swamps; forms peat; covered by, sediments / mud / sand; pressure and heat (over millions of years turned plant remains to coal);	**3**
5(b)	*both advantages and disadvantages must be covered for maximum credit:* *maximum three from, advantages:* plenty of supplies / readily available / near surface; cheapest fossil fuel / cheap method of extraction (open-pit mechanical); coal-fired power stations relatively, easy / cheap to build; constant supply of energy as can be burned 24:7 / reliable energy resource; high-energy fuel; easy to, store / use; *maximum three from, disadvantages:* non-renewable; cannot be pumped or piped (unlike gas or oil) / difficulty and cost of transporting solid coal; (high carbon content means) emits CO_2 leading to, (enhanced) greenhouse effect / global warming; emits, sulfur dioxide / oxides of nitrogen leading to acid rain; dangerous to, mine / extract;	**4**
5(c)(i)	all four plots correct ;; (*allow one mark for 2–3 plots correct* [1]);	**2**
5(c)(ii)	Asia and Oceania;	**1**
5(c)(iii)	Europe;	**1**

Question	Answer	Marks
5(c)(iv)	*any three from:* increase from 1965 to 1988–1990; decrease until 1995 / decrease after 1990; little change / small fluctuations to 2015; relevant quoting of data / increase over the period 1965 to 2015;	**3**
5(c)(v)	*both Europe and Asia and Oceania must be covered for maximum credit:* *maximum three from, Europe:* stable / decrease in, industry; increased, fuel efficiency / conservation of energy; decreased fuel consumption due to insulation of buildings; energy efficiency measures, e.g. turning appliances off; slower population increase / stable population; *maximum three from, Asia and Oceania:* rapidly growing population; economic growth; urbanisation / growth of cities; increase in industry; increase in vehicles; greater wealth so can afford electronic, appliances / equipment;	**5**

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Question	Answer	Marks
6(a)	*any three from:* (steep) increase from 1990–1994 to 1995–1999 / peak at 1995–1999; decrease from 1995–1999 / (sharp) fall to 2000–2004; gradual decline until 2010–2014; use of data to support the change described;	**3**
6(b)(i)	all segments correctly plotted ;; shaded as per key;	**3**
6(b)(ii)	*commercial agriculture* – the production of, crops / animals for sale; *subsistence agriculture* – farming that provides enough food for the farmer and their family;	**2**
6(b)(iii)	*any one from:* roads / transport; settlements / urbanisation; rock and mineral extraction; industry; fuel-wood;	**1**
6(b)(iv)	*any four from:* forests / trees, act as carbon stores / carbon sinks / less photosynthesis; loss of habitats; increase in CO_2 from, burning / decomposition; (increase in CO_2) contributes to, (enhanced) greenhouse effect / global warming / climate change; effect on water cycle; increased, soil erosion / flooding (due to lack of, tree cover / roots); visual pollution; source of food / source of (potential) medicine; loss of tree species / reduces biodiversity / causes extinctions / food chains or food webs, disrupted;	**4**
6(c)(i)	*producer* algae **AND** *tertiary consumer* large fish;	**1**

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Question	Answer	Marks
6(c)(ii)	decreasing bar width; centered bars **AND** labels;	**2**
6(c)(iii)	leaves absorb / use, energy from sunlight **AND** by means of chloroplasts / chlorophyll; to convert water and CO_2 **AND** into glucose and oxygen;	**2**
6(d)	*any two from:* both increased and then decreased; inland highest in 1975–1990, coastal highest in 1941–1974; inland lowest in 1991–2010, costal lowest in 1900–1940; correct comparison of the inland and coastal wetlands within a time period;	**2**

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