Cambridge O Level

ENVIRONMENTAL MANAGEMENT **5014/12**

Paper 1 **October/November 2016**

MARK SCHEME

Maximum Mark: 120

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.

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This document consists of **12** printed pages.

Question	Answer	Marks
1(a)(i)	5;	1
1(a)(ii)	20;	1
1(a)(iii)	rocks;	1
1(b)	*any 4 of:* *bacteria* break down dead organic matter; convert organic matter to a form that can be used by plants; fix nitrogen in root nodules of legumes; fix nitrogen in the soil; change / nitrify ammonium into nitrites; change / nitrify nitrites into nitrates; *earthworms* consume organic matter; mix it into the soil; burrows help the infiltration of water / air; improve soil structure / stability; by mixing humus with mineral particles; allow max 3 from any one section	4
1(c)	*any 3 of:* add clay / add silt; add organic matter; add fertiliser; add lime / add calcium;	3

Question	Answer	Marks
2(a)(i)	*any 2 of:* 3 700 000 tonnes in 2010 compared with 2 400 000 tonnes in 1980: it has increased; by about 1 300 000 tonnes;	**2**
2(a)(ii)	*any 4 of:* quotas; licences; control net types; control net sizes; control mesh sizes; patrol vessels; inspection of vessels at sea; laws on illegal fishing / fines / penalties; obtain international cooperation; exclusion zones / reserves / marine conservation areas; limit to harvesting / fishing season;	**4**
2(b)(i)	*any 1 of:* sheltered harbours / sheltered inlets; long coastline; controls a large area of sea; large coastal fishery;	**1**
2(b)(ii)	Svalbard (Islands);	**1**
2(b)(iii)	*any 2 of:* allow fish to reproduce; increase fish stocks; to reduce overfishing; to make fishing sustainable; economic reasons;	**2**

Question	Answer	Marks
3(a)(i)	bar at 479 mm;	1
3(a)(ii)	erratic / variable / varies / unpredictable / description of data;	1
3(a)(iii)	more rain fell in one day than year to date / 22 mm in one day compared to 17 mm in previous 8 months;	1
3(a)(iv)	*any 3 of:* drought / little rainfall; long period / seven months without rain; shortage of water for domestic use; shortage of water for, industry / farming; ground baked hard; dusty; possibility of (flash) floods on days with rainfall;	3
3(a)(v)	desert;	1
3(a)(vi)	rain gauge	1
3(b)(i)	it evaporates / infiltrates quickly;	1
3(b)(ii)	rainfall infiltrates / passes down through the soil into rocks;	1

Question	Answer	Marks
4(a)(i)	*any 2 of:* descriptions of, grass; trees; savannah animals;	**2**
4(a)(ii)	*do not drive off the roads* damage habitats / endanger animals; *do not litter* dangerous for wildlife / some toxic / sharp / unsightly / prevent disease / food attracts wildlife to go where they are not wanted; *ensure that entrance and accommodation fees have been fully paid* income used for wildlife conservation / employment of local people to maintain the park etc.;	**3**

Question	Answer	Marks
4(a)(iii)	*any 3 of:* speed limit – to reduce danger to animals; beware of dangerous animals – to prevent harm to tourists; stay in your car – to prevent harm to tourists; read your permit – because it reminds of, the rules / regulations; report to the nearest office before proceeding into the Park – so can check that no one has been left in the Park; do not feed the animals – to prevent harm to animals; no motorbikes / quad bikes – to reduce noise; no pets – to avoid transfer of illness to animals; stay in vehicle except in designated areas – to allow access to facilities; no person in back of open vehicle / no window/door open – to avoid danger from animal attack; no driving after sunset / before sunrise / at night / in dark – because lights frighten animals;	3
4(b)(i)	WWF / CITES / UNEP / IUCN / Friends of the Earth / Greenpeace;	1
4(b)(ii)	to preserve biodiversity / prevent genetic depletion / prevent loss of habitat / generate income / employment for people;	1

Question	Answer	Marks
5(a)(i)	(the number of live) births per 1000 population per year; average/expected number of years that a person can expect to live for;	2
5(a)(ii)	3.0	1
5(a)(iii)	highest natural increase: country A; a natural population decrease: country E;	2
5(a)(iv)	rank order: A, D, C, B, F, E; correct plots;;	3
5(a)(v)	immigration / in-migration;	1
5(b)(i)	3; 6; country X;	3
5(b)(ii)	narrower base / wider section moves up through pyramid (in time);	1
5(b)(iii)	*any 3 of:* country X has a narrower base than country Y; country X has a more rectangular shape / where country Y has a narrowing shape; country X has a wider top than country Y; country X has more males in relation to females, country Y is equal; country X has a larger population at 25–39 / middle of chart compared to country Y;	3
5(b)(iv)	*any 3 of:* higher birth rate in country Y / reason to explain; lower infant mortality in country Y / reason to explain; longer life expectancy in country X / reason to explain; population boom in country X approximately 30 years ago;	3
5(b)(v)	*any 4 of:* population policies;	4

Question	Answer	Marks
	improved healthcare so births are reduced as more children survive; availability of contraception; education in contraception migration controls; improved education so women are able to access jobs / improve education so income increases / less need for large family to provide income;	
5(b)(vi)	*any 3 of:* more healthcare needed; longer waiting lists in hospitals; more money for medicines; pressure on governments for pensions; more nursing homes needed; strain on those active in the economy; increased taxation; AVP;	**3**
5(c)(i)	falls / decreases / declines;	**1**
5(c)(ii)	stage 3;	**1**
5(c)(iii)	*any 3 of:* improved medicines / cures for diseases / vaccinations; more / better, doctors / nurses / medical staff; more / better, hospitals; cleaner water; improved sanitation; improved economic situation / can buy resources; improved food supplies; lack of wars; people have healthier lifestyles;	**5**
5(c)(iv)	*any 1 of:* does not take account of time taken for each stage;	**1**

Question	Answer	Marks
	no stage 5; does not predict natural decrease; does not account for migration;	
5(d)	*any 6 of:* overgrazing; more cattle / people in (limited) area; less opportunity for crop / land rotation; increased compaction / trampling; loss of soil structure; over-cultivation; reduction in quality of soil / soil loses fertility; mono-cropping issues / mineral nutrient depletion; overuse of artificial fertilisers / lack of organic matter; irrigation poor practice; leaching / soil erosion; deforestion; Population growth / space needed for agriculture / settlement; salinisation; (due to) poor irrigation practice; explanation of impact of salinisation; land disputes causes population displacement; soil is exposed; lack of roots to bind; lack of organic matter / humus degrades soil structure; can be washed away in heavy rain; wind can blow soil away:	6
6(a)(i)	line positioned in correct place on pie graph;	2

Question	Answer	Marks
	correct shading according to key;	
6(a)(ii)	*any 2 of:* carbon dioxide / water vapour / argon / methane / ozone / CFCs / AVP;;	**2**
6(a)(iii)	*any 2 of:* carbon dioxide; deforestation / burning trees / fossil fuel use; sulfur dioxide; power stations / burning fossil fuels; nitrogen oxides; vehicle exhausts; methane; paddy fields / landfill; CFCs; aerosols / refrigerators; lead oxide; burning petrol; AVP for gas; or source;	**2**
6(a)(iv)	*any 3 of:* breathing difficulties / asthma / bronchitis; exposure to ultra violet radiation; eye cataracts; increased risk of cancer / skin cancer; malnutrition or named example of deficiency disease, etc; malaria / diseases; decreased water supply / dehydration; heat stroke;	**3**
6(b)(i)	stratosphere;	**1**
6(b)(ii)	50 (km)	**1**
6(b)(iii)	100–1000 (mb)	**1**
6(b)(iv)	temperature decreases as the height in the troposphere increases;	**1**
6(b)(v)	where the weather occurs;	**2**

Question	Answer	Marks
	greenhouse gases occur; zone where many aircraft fly; dust; AVP;;	
6(c)(i)	thermometer; sunshine recorder (accept named item); barometer / barograph / manometer;	**3**
6(c)(ii)	*any 4 of:* three cups facing different directions; cups blown by the wind and rotate; held away from, body / buildings / obstructions; cups linked to a meter which records rotations / cups linked to a scale which shows wind speed; measured in km per hour / other named units; on a pole so can be lifted into the wind;	**4**
6(c)(iii)	*any 5 of:* For: renewable / will not run out / alternative energy source; does not cause, air pollution / global warming / acid rain; cheap once set up; Against: can cause noise; takes up land; unreliable – wind does not always blow; looks unsightly; expensive to set up especially for LEDCs; takes up large areas of land; kills birds;	**5**
6(d)(i)	correctly placed lines;; shading according to key;	**3**

Question	Answer	Marks
6(d)(ii)	67 (%);	**1**
6(d)(iii)	Oil;	**1**
6(d)(iv)	France (given) Switzerland Finland (given) South Korea UK China 4 correct = 2, 3 correct =1, 1/2 correct = 0	**2**
6(e)	Level of response marking Indicative content: Fossil fuels are running out Plentiful supplies of uranium Does not cause air pollution / fossil fuels cause air pollution Fossil fuels give out CO_2 and SO_2 Will not cause global warming Conserves fossil fuels for other uses such as transport Risk of oil spills Lack of suitable sites for alternative energy Unreliable nature of alternatives Expensive to set up	**6**