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Cambridge International General Certificate of Secondary Education

ENVIRONMENTAL MANAGEMENT **0680/21**

Paper 2 **October/November 2016**

MARK SCHEME

Maximum Mark: 80

Published

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Question	Answer	Marks
1(a)(i)	*any 3 of:* close to / around / along / north of, the Arctic Circle; 60–75 degrees north (accept figure within latitude range); in the northern hemisphere; along the northern margins (of continents); in North America / Europe / Asia / named country;	**3**
1(a)(ii)	*any 1 of:* the area of tundra will reduce / shrink / become smaller; the margin / edge of tundra will move further north;	**1**
1(a)(iii)	*any 4 of:* carbon dioxide: factories / power stations / burning fossil fuels / burning rainforests / deforestation / vehicle exhausts; methane: intensive cultivation / paddy fields / landfill; nitrous oxide / nitrogen oxides: vehicle exhausts / transport; CFCs: aerosols / fridges; water vapour: power stations;	**4**
1(b)(i)	both points correctly plotted; correct completion of the line:	**2**
1(b)(ii)	number of months below freezing: 9 the month with the highest precipitation: July annual temperature range: 34 (^{o}C)	**3**

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Question	Answer	Marks
1(b)(iii)	*any 4 of:* low growing / close to the ground; for protection against the wind; short roots; t to avoid the permafrost / frozen ground; small leaves; t to reduce loss of water by transpiration; life cycle is short; to flower and set seed in short growing season; cup / rosette shape; efficient light collection in centre of plant / retains heat; reproduce by budding / division; to make maximum use of short growing season;	**4**
1(c)(i)	an animal that eats green plants / an animal that eats another animal	**1**
1(c)(ii)	*any 4 of:* disrupts current food chain; more food for polar bear and wolves; less food for arctic fox and snowy owl; less territory for arctic fox; numbers of arctic fox may decrease: red fox might out compete arctic fox; numbers of primary consumers would reduce / named example;	**4**

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Question	Answer	Marks
1(d)(i)	*any 3 of:* from dead organisms; on sea beds / swamps; covered (in sediments); compressed / pressure; reference to millions of years;	**3**
1(d)(ii)	Prudhoe Bay; Valdez; Yukon;	**3**
1(d)(iii)	*any 1 of:* route too dangerous / risk of oil spill; north part of the sea would be frozen for much of the year; more direct route / faster transport; cheaper once built;	**1**
1(e)(i)	*any 3 of:* vegetation would be damaged / habitat loss; vegetation will take time to recover; oil spills / any impact of oil spills; caribou cannot migrate and look for food / caribou would have less food / forced to migrate; could disturb breeding of the caribou; might frighten caribou away; visual pollution / ruin the view / noise pollution/ air pollution (if qualified); melting permafrost / boggy ground;	**3**
1(e)(ii)	*any 2 of:* to stop the warm oil coming in contact with the ground / prevent melting of the permafrost; so caribou (and other animals) could pass underneath the pipeline ; reduces heat loss from oil in pipeline; easier to build / maintain;	**2**

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Question	Answer	Marks
1(f)	Level marked question Indicative content: Fossil fuels will run out / are non-renewable / alternative energy sources are renewable / will last into the future Fossil fuels cause global warming / air pollution / acid rain / alternative energy sources are cleaner / less polluting Fossil fuels are subject to price fluctuations / security of supplies / conflicts Fossil fuels can cause problems during transport, e.g. oil spills Dangers of mining accidents / extracting fossil fuels Scars on the landscape from mining Use of alternative fuels will make fossil fuels last longer Some alternative energy supplies are cheaper to run Sites for alternative energy are limited Some need a lot of land to generate a small amount of energy Costly to set up Some countries may not have the technology – developing Unreliable, e.g. sun does not always shine idea Abundant supplies of fossil fuels locally Fossil fuels are energy rich	**6**

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Question	Answer	Marks
2(a)(i)	correct plot	**1**
2(a)(ii)	8500 million	**1**
2(a)(iii)	*any 5 of:* declining infant mortality rate; high / increasing birth rates; lack of available contraception; people (in LEDCs) cannot afford contraception; lack of education about how to use contraception; high infant mortality rate so people have more children in the hope that some will survive; death rates are falling / high life expectancy / people live longer; cures for diseases / better medical facilities; vaccinations; improved sanitation; improved water supply; government incentives; religious beliefs / ban on abortion / contraception; abundance of food / better farming methods;	**5**
2(b)(i)	*any 5 of:* fuel wood / for heating and lighting; subsistence farming / slash and burn / shifting cultivation / to provide food; commercial farming / cash crops / plantations; urbanisation / settlement; timber / commercial logging; mineral extraction; cattle ranching / to sell beef to other countries; roads / for communication;	**5**
2(b)(ii)	20676 (km^2)	**1**

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Question	Answer	Marks
2(b)(iii)	*any 2 of:* it has decreased / fallen; approximately halved in 3 years; correct data quote;	**2**
2(b)(iv)	greater concern for environmental issues / concerns over global warning / new rules or laws;	**1**
2(c)(i)	*any 3 of:* fewer trees to photosynthesise; (therefore) less carbon dioxide removed; increased levels of carbon dioxide in the atmosphere; carbon dioxide released from burning rainforests;	**3**
2(c)(ii)	*any 4 of:* soil has no protection from trees / soil left bare; (less interception so) more surface run-off; sun can dry soil; (less humus / decaying vegetation so) soil becomes infertile; rainwater leaches minerals from soil; less humus so soil less cohesive / loses structure; no roots to bind the soil; soil is eroded;	**4**
2(d)	*any 4 of:* draining of wetlands; dam building; (intensive) agriculture / grazing; trawling; tourism or specific example; named type of relevant pollution, e.g. heavy metal, fertilisers, oil spill, acid rain; mining; construction / road building;	**4**

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Question	Answer	Marks
2(e)(i)	suitable scale and *y*-axis labelled; correct labelling of countries; correct plots;;	**4**
2(e)(ii)	Kenya;	**1**
2(e)(iii)	*any 1 of:* more land available; more wildlife / more endangered species; government supports / invests in national parks; more concern for the environment; AVP;	**1**
2(e)(iv)	*any 1 of:* sustainable harvesting; wildlife reserves; world biosphere reserves; gene banks; education; laws: zoos; AVP;	**1**

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Question	Answer	Marks
2(f)	Level marked question Indicative content: agroforestry community forestry reforestation sustainable harvesting fuel wood planting genetic engineering efficient use of timber recycling alternatives materials to timber education prevention of deforestation laws and permits / licensing monitoring introduction of eco-tourism forest reserves protected areas	**6**

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