

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International General Certificate of Secondary Education

**MARK SCHEME for the October/November 2015 series**

**0680 ENVIRONMENTAL MANAGEMENT**

**0680/13**

Paper 1, maximum raw mark 60

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1 (a) 6 (six)

December/January

January/December

July

26.5–27 °C

June

*Six correct for three marks. Four or five correct two marks. Two or three correct one mark. [3]*

(b) are evergreen/trees have leaves all year;  
do not lose nutrients in lost leaves;

are able to photosynthesise at low temperatures/(trees grow in) short growing season;  
so can continue to grow even though growing season would be short if they could not;

(waxy) needle-shaped leaves; reduce water loss by transpiration; in freezing winter temperatures; when there is little rain in summer;

pyramid/conical shape; gives trees stability/trees bend in the wind;

downward sloping/flexible branches; to stop snow from collecting/snow slides off easily;

straight/upright trunk/growth; to receive maximum sunlight;

thick bark; insulates/protects tree in cold winters; fires in summer;

[4]

(c) *Credit two strategies with one developed correctly.*

sustainable harvesting of wild plant and animal species;  
so as not render them extinct;

wildlife/nature reserves;

protected by law;

example, e.g. panda in China/tiger in India;

world biosphere reserves where plants and animals can be protected in their natural environment;

internationally recognised by UNESCO;

to use sustainably;

support with research;

monitoring;

education;

international network for information exchange;

gene banks to preserve plants and animals in danger of extinction;

plant genes as seeds/whole plants/pollen/cell cultures;

animal genes by freezing sperm and eggs;

[3]

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- 2 (a) (i) most/five are north of the Equator/in northern hemisphere/Tropic of Cancer/one is south of the Equator/in southern hemisphere/found on east and west coastline of North America/found west coastline of Europe/North Africa/South America/found east coastline of Asia;  
generally near coasts;  
on all continents except Oceania;

*Credit two accurate descriptive points.* [2]

- (ii) some years the cold current reverses;  
event is called 'El Niño';  
surface water becomes warm;  
the warm current is low in oxygen/minerals/nitrates/nutrients;  
plankton and fish die/move away/migrate to colder waters;

Peruvian current is off the coast of area X;  
this current brings cold water from the Antarctic;  
upwelling of cold water to the ocean surface makes the surface water cold;  
the cold current is rich in minerals/nitrates/nutrients;  
which support (phyto)plankton;  
which (zooplankton)/fish feed on;

*Credit the below ideas in context.*

temperature changes;  
nutrient level changes;  
oxygen level changes;  
plankton/fish food changes;

[4]

- (b) *Credit two causes with two marks for development/explanation.*

new technology / satellites / radar / sonar equipment;  
locate shoals of fish quickly and accurately;

very large nets;  
trap larger shoals of fish;  
mature and immature fish / bycatch / discards;

mesh sizes used have decreased;  
smaller and smaller fish caught;

large ships;  
travel further from land / to more difficult locations;  
catch more fish;

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factory ships;  
 process/freeze fish/fish products while at sea;  
 allow fishing all year round;  
 catch juvenile fish;

increasing demand for food by growing world population;

few international fishing regulations, e.g. quotas;  
 those that exist are not always implemented/enforced;

pirate fishing;  
 illegal/unregulated/unreported;

[4]

**3 (a) (i)** over a million;

[1]

**(ii)** lava/ash produces fertile soils for farming;  
 family/friends live there/have always lived there (in Sicily)/part of (Sicilian) community;  
 jobs/investments are there/cannot afford to move;  
 many/over a million people live there so risk not great enough to move;  
 good forecasting/protection schemes;  
 (volcanic) tourism/scenery;  
 minerals; e.g. copper/gold/silver/lead/zinc;  
 valuable gems; e.g. diamonds/opals;  
 (volcanoes provide) building materials;  
 geothermal energy can be generated (in volcanic areas);

*Allow development marks.*

[3]

**(b)** monitoring/warning/predicting the eruption;  
 instruments/satellites measure changes in temperatures/heat in the crater/observations of  
 emissions of gases/steam/seismographs record small earthquake shocks caused by  
 moving magma/tilt meters/global positioning satellites/surveying instruments/satellite radar  
 maps to record changes in ground shape/deformation;  
 evacuation/re-location;  
 redirecting lava flow;  
 by digging diversion canals/halting advance of lava by dropping concrete slabs/making a  
 wall of concrete blocks/spraying water;  
 avoids damage to buildings/deaths/injury;  
 education/training/emergency action plans/drills;  
 reinforcing buildings, e.g. sloping roofs;  
 reduces damage to buildings/protects people in buildings;  
 zoning;

*Allow development marks.*

[4]

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- (c) small in magnitude/strength/low on Richter scale;  
 distance of area/population away from epicentres/fault lines;  
 depth of earthquakes from surface/focus;  
 time of day/time of year in context;  
 earthquake-resistant buildings/quality of building construction/design;  
 population density/urban or rural;  
 existence of warning systems/speed of relief/aftercare;  
 damage to infrastructure/water/gas;  
 rescue response times;

*Allow other valid suggestions.* [2]

4 (a) (i) migration

*Accept emigration/immigration.* [1]

- (ii) push factors:                      pull factors:  
 C    A  
 D    B  
 E    G  
 F    I  
 H    J

*Award one mark for any three push factors and one mark for any three pull factors.* [2]

(b) (i) *Credit one or two ideas developed.*

more people using energy/more power stations;  
 more factories;  
 more vehicles;

developed with reference:  
 emission of carbon dioxide from industry/vehicles;  
 increase greenhouse gases;  
 unburnt smoke particles;  
 lead emissions from vehicles;  
 sulfur dioxide/nitrogen oxides;  
 smog etc.;

[3]

(ii) *Credit two strategies with two marks available for development/explanation.*

demolition by city authorities;  
 residents homeless;  
 move somewhere else;  
 authorities plan new use for land;  
 e.g. fewer high cost houses for wealthy people;

relocation of people to other parts of the city/areas of new housing;  
 in some cities too expensive for city authorities;  
 unrealistic as so many people;  
 in other cities too expensive for people;  
 people cannot afford houses;

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community participation / self-help schemes;  
 making settlements legal;  
 authorities provide (cheap) loans / building materials;  
 advice / technical assistance;

environment improvement with essential services;  
 electricity / roads / piped water / sewers;

planning a city's physical expansion;  
 zoning of land for new housing;

[4]

5 (a) (i) 21

5

6

*All three correct for one mark.*

[1]

(ii) 44;

[1]

(b) distance from the Equator / latitude;  
 distance from ocean / sea / large lake;  
 amount of snow / albedo;  
 altitude;  
 cloud cover;  
 warm / cold ocean currents;  
 warm / cold winds;  
 smog / temperature inversion;

[2]

(c) (i) ice caps melt;  
 sea levels rise;  
 coastal flooding;  
 cost of sea defences;  
 cities / holiday resorts / islands covered;

the habitats of plants and animals will change;  
 loss of biodiversity; some animals may migrate, other animals / plants lose their  
 habitats / become extinct;

changes ocean currents / e.g. Gulf Stream / North Atlantic Drift cools;  
 climate of N Europe colder in winter, etc.;

more flash floods;  
 more water evaporated into the atmosphere;

more extreme weather events;  
 stronger tropical storms;  
 heatwaves;  
 forest fires;

melting permafrost;  
 releases large amounts of methane in the atmosphere;  
 increases greenhouse effect;

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more fresh water in oceans;  
affects ocean currents;

droughts;  
desertification;  
crop failure;  
famines;

[4]

(ii) *Credit one advantage with explanation.*

lower deaths / injuries; named cold climates warm up;  
more crops grown; world famine reduced;  
water held in ice caps and glaciers melt giving water supplies;  
more accessible resources in Arctic / Antarctica, e.g. oil / gas / etc.;  
Arctic ice melts improving trade between Scandinavia, Russia, Canada and USA, etc;  
less energy required to heat homes;  
reduced demand for gas and electricity;  
reducing amount of greenhouse gases being released;

[2]

6 (a) (i) Middle East;

[1]

(ii) (10.4 / 10.3) – 3.0);

7.3–7.4 thousand million barrels per year;

[1]

(iii) in the Asia Pacific region consumption is (much) higher than production;  
by about 8 million barrels;  
Asia Pacific region has the low(est) oil reserves / less than 100 thousand million barrels;

[3]

(b) (i) pipeline / oil tanker / train;

[1]

(ii) *Credit two problems about transport of oil with two marks available for development / explanation.*

pipelines can break;  
oil seeps into ground; polluting the land;  
destroying crops / pasture land;  
contaminating the soil;  
polluting water supplies;

oil tankers run aground or sink, oil leaks into sea;  
kills animals / plants / fish / birds;  
destroys habitats;  
damages (tourist) beaches / bays / lagoons;  
oil spills can disrupt power stations / desalination plants that require a continuous supply of clean seawater;  
interfere with the safe operation of coastal / industries ports;  
clean-up operations can lead to further problems;

[4]

[Total: 60]