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

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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CAMBRIDGE
International Examinations

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]

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;

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]

(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;

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;

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]