CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the May/June 2015 series

5014 ENVIRONMENTAL MANAGEMENT

5014/11 Paper 1, maximum raw mark 120

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

Section A

1 (a) (i) name: open cast / open pit / quarrying;
method: remove soil / overburden;
blasting / explosives;
remove rock in layers;
broken rock removed by bulldozers / diggers;
= 2 [3]

(ii) noise of blasting / bulldozers;
heavy lorries in roads;
dust / air pollution;
ugly / visual pollution / scar on the landscape / eyesore;
vibrations from blasting;
loss of land for other purposes;

One mark for basic statement and allow second mark for development. [4]

(iii) employment / income improves standard of living;
shops / services develop (to serve the workers);
roads improved; [1]

(b) plant trees around it;
remove quarry buildings;
fill it in and put the soil back;
so vegetation regrows / grass it over (development);
make it into a lake;
use it as a nature reserve / recreation; [2]

2 (a) (i) A: water evaporates (into the air) / water changes to water vapour;

B: water vapour condenses / changes to water droplets / precipitation / rainfall;

C: the rain runs off (down slope) back to the sea; [3]

(ii) infiltration; [1]

(iii) leaves intercept rain and it evaporates;
roots extract water from the soil;
space between roots and soil particles allow infiltration;
leaves provide shade so less evaporation occurs; [2]

(iv) extraction for irrigation;
extraction for industrial water;
extraction for domestic water;
water taken into canals for navigation;
dammed rivers / reservoirs reduce flow downstream;
climate change (impact explained); [3]

(b) too far inland / heart of continent / too far from a sea / ocean;
flat / no relief to make the air rise / other causes of uplift and rainfall;
rain shadow regions,
cold so precipitation falls as snow / rivers / lakes freeze;
areas of impermeable rock have no infiltration / percolation;
areas of bare rock have no infiltration;
deforestation reduces infiltration / increases run-off / decreases interception;
not a closed system; [1]

3 (a) (i) Wilma Megi Yasi;;

Three correct for two marks. Two correct for one mark. [2]

(ii) August to October; [1]

(iii) the sea is at its warmest / hot / 27 °C / above 27 °C; [1]

(b) strong winds uproot trees;
strong winds destroy crops;
strong winds damage / destroy buildings / homes / industries;
strong winds destroy power lines / telephone communications / other;
strong winds / floods result in deaths of people / animals;
strong winds cause storm surges;
heavy rain causes flooding;
flooding pollutes water supplies / disrupts sewage treatment;
flooding disrupts transport;
etc. [3]

(c) differences in advance warning times given;
differences in the strength of the buildings;
different population densities;
differences in the provision of shelters stocked with water / food;
differences in the ability to pay for preventative measures / post-cyclone help;
differences in the amount of provision of emergency relief / aid;
differences in the numbers evacuated;
differences in the relief of the coastline / delta / low / cliffs; [3]

4 (a) (i) two correct lines plotted for two marks;;
correct use of key; [3]

(ii) any sensible land use, such as:
urban / transport / water storage / H.E.P. / mining; [1]

(b) (i) displaced from their homes;
way of life changed / loss of livelihoods;
loss of source of fuel;
lack of forest products for food;
lack of traditional medicines from the forest;
conflicts with the logging companies; [2]

(ii) replant after felling;
selective logging / clear only the individual tree species needed;
select only the mature trees;

Allow development marks. [2]

(c) (i) P / core area to conserve the ecosystem / species / landscape; [1]

(ii) eco-tourists / small groups / people interested in nature / always with a ranger / official guide; [1]

Section B

5 (a) (i) temperatures increase then decrease;
precipitation increases then decreases;
cold winters / below freezing in winter;
warm / hot summers;
low rainfall / approx. 120 mm per year;
max. rainfall is 20 mm per month / max. temp is 23 °C;
less than 5 mm per month in winter;
rainfall lowest in winter / highest in summer;
allow one mark for average temperature or precipitation;
data from graph to a max. of two marks;; [4]

(ii) insufficient rainfall (for crops or pasture);
high evaporation in summer;
cold winters – no pasture for animals; [2]

(b) decreased in size;
split into two or more 'seas';
mainly disappeared from the east / now mainly on the west;
more disappeared from south than north;
most rapid decrease since 1984;
c.25% loss by 1984;
c.60–70% loss by 2007;
allow width measurements to show reduction; [3]

(c) (i) correct scale on *y*-axis;
correct labelling of axes;
all three bars correct;;
one or two correct;

If line graph then max. three marks.
If cumulative bar graph, max. two marks. [4]

(ii) 12 (km^3); [1]

(iii) evaporation;
more water evaporated than flowed into the Aral Sea;;
some lost by infiltration; [2]

(d) (i) fertilisers will lead to growth of algae;
eutrophication;
reduced oxygen in water causes fish to die;
algal blooms block sunlight;
plants die due to lack of photosynthesis;
pesticides will poison fish;
increase in salt will cause fish / plants to die;
fewer fish means fewer birds that feed on fish;
disruption to food chain;
less water surface so less evaporation and so less rainfall;
desertification;
vegetation around lake changes to salt-tolerant vegetation; [5]

(ii) less fish means loss of work / income for fishermen / farmers;
less rain so more difficult to grow crops;
reduction in food supply (either fish or crops);
health problems from poor diet;
health problems from chemicals in the water / inhaled;
birth defects;
desalination plants cannot cope with increased salinity; [3]

(e) (i) trees (deciduous) / shrubs / bushes; [1]

(ii) little vegetation;
animals have grazed it bare;
rain washes soil away / soil erosion (by wind or water);
deep gullies (where soil washed away);
desertification; [2]

(iii) *Basic explanation such as 'terracing' for one mark; and extra detail for second mark.*

terracing, to stop water and soil flowing down the slope;
contour ploughing, to stop water and soil flowing down the slope;
mixed cropping, so soil never left completely bare;
plant tree crops with grass underneath, so soil always covered;
prevent overgrazing, by reducing stock levels; [4]

(iv) *Allow development marks for detailed responses.*

with no soil crop growth reduced;
soil loss containing nutrients leads to infertile land / soil;
leads to farmer going out of business / malnutrition;
once soil lost cannot be replaced / irreversible;
soil may be washed / blown into rivers;
leading to flooding;
and decline in water quality; [3]

(f) wide range of possibilities concerned with:

soil conservation
integrated pest control
improved irrigation
organic fertilisers
genetic plant breeding
reducing meat / dairy consumption

however, world population growing fast so more food needed
and demand for meat / dairy increasing
desertification, salination, soil erosion, etc. decreasing agricultural land

Do not expect every aspect to be covered, even for answers in the top level.

Level 3 5–6 marks

Answers the question giving at least two ways sustainable agriculture can meet growing demand and one reason why it cannot or other way round (one that it can and two that it cannot). But can achieve five marks on one view only if done very well.

Level 2 3–4 marks

Some detail of at least two ways agriculture can be sustainable or two ways that it cannot or one each way. With a basic explanation will lift it to the top of the level. Max. three marks if limited detail.

Level 1 1–2 marks

Basic descriptive points with little or no explanation. May just be a list or just one view of sustainable agriculture or problems due to population growth.

No response or no creditable response scores zero marks. [6]

6 (a)

term	letter
food chain	W
habitat	Y
population	Z
producer	X

All four correct for three marks.
Three correct for two marks.
Two correct for one mark. [3]

(b) (i) *All four correctly plotted for two marks.*
Two or three correctly plotted for one mark.
One or none correctly plotted scores zero marks. [2]

(ii) 11 (°C); [1]

(iii) 18 (mm); [1]

(iv) winter / cool season; [1]

(v) March:
leaves on trees;
tall / green grass;

August:
some trees have lost leaves;
sparse brown / yellow grass;

Max. two marks on either.
One mark for general comment more / less grass / leaves. [3]

(vi) March – wet season; August – dry season;
rainfall / water availability; [1]

(c) (i) for water / mud bath; [1]

(ii) (large area) destroyed / vegetation trampled / eaten / debarking trees / overgrazed; [1]

(iii) more vegetation destroyed / less vegetation;
loss of biodiversity;
loss of habitats for other animal species;
less food for other herbivores;
therefore less food for predators;
soil erosion as no interception, no plants to absorb soil moisture;
increased compaction of the soil;
increase in dung so more dung beetles; [4]

(d) WWF is a nature conservancy / environmental organisation / wildlife protection;
elephant population already under threat / endangered / to prevent extinction;
elephants are part of the ecosystem;
so reducing their numbers upsets the balance of the ecosystem; [2]

(e) **(i)** fewer than 700 000; [1]

(ii) scattered;
none in extreme north / North Africa / north of Tropic of Cancer;
few in West Africa;
spread through other regions;
largest areas in: East Africa, northern parts of Southern Africa, around Equator in West Africa;
most between Equator and Tropic of Capricorn;
savanna regions;
etc.;
Credit any three valid points. [3]

(iii) *Increasing because:*
hunting is banned;
creation of national parks / reserves;
trade in ivory banned;
stable government to enforce ban;
more severe penalties for poaching;

Decreasing because:
poaching still goes on;
loss of natural habitat;
farmers killing elephants to stop them eating / destroying crops [3]

(f) **(i)** 2.5 (billion); [1]

(ii) 8.9 (billion); [1]

(iii) Asia and Oceania; [1]

(iv) 12–18 (years); [1]

(v) vaccinations / eradication / reduction in diseases (such as smallpox);
improved medical care;
improved sanitation / water supply;
so people living longer;
fewer die as infants / more infants survive;
so grow up to reproduce;
better nutrition;
role of education explained;
etc. [3]

(vi) wide range of possibilities concerned with:

loss of biodiversity and habitats on land and / or in oceans
soil exhaustion, erosion
increasing pollution leading to global warming, eutrophication, etc.

Do not expect every aspect to be covered, even for answers in the top level.

Level 3 5–6 marks

At least two environmental problems described and explained in detail, or three in less detail, but still needing explanation.

Level 2 3–4 marks

Some detail of at least a couple of environmental problems. With a basic explanation will lift it to the top of the level.

Level 1 1–2 marks

Basic descriptive points with little or no explanation. May just be a list or just one environmental problem.

No response or no creditable response scores zero marks. [6]

[Total: 120]