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Cambridge International General Certificate of Secondary Education

MARK SCHEME for the May/June 2015 series

0680 ENVIRONMENTAL MANAGEMENT

0680/22 Paper 2, maximum raw mark 80

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1 (a) (i) up then down;
very low Jan to May;
starts increasing (rapidly) in June;
reaches peak in August;
then declines (rapidly);
max. two marks for quoting data from the graph: peak ca.36 000, lowest <1000, below 2500 Jan to May etc.;; [4]

(ii) discharge increase with rainfall / positive relationship;
peak a month later than peak rainfall;
because water takes time to reach / flow down the river; [2]

(iii) end of / mid July; to start of / mid October;
August and September; [2]

(iv) *Allow one mark per point plus one mark for development where appropriate.*

loss of life;
crops / livestock destroyed;
lack of food / malnutrition / starvation;
water supplies contaminated;
may lead to cholera / typhoid;
stagnant water for breeding mosquitoes;
increasing risk of malaria;
houses and contents damaged / lost;
homelessness;
infrastructure / transport disrupted;
cost to government;
businesses damaged;
people out of work;
loss of income;
food costs increase;
time / effort / cost of restoration when floods recede; [5]

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(b) (i) 3% [1]

(ii) $1390 \times \frac{3}{100}$ (million)
41.7 million km^3

*Accept ECF from **(b)(i)**.* [2]

(iii) most water not available for use;
as it is in glaciers and ice caps;
or deep underground;
only small amount in rivers;
water not evenly spread over the Earth / wide variations in rainfall;
rapid population growth;
increasing demand for industry / irrigation / etc.;
rivers / lakes polluted; [4]

(c) (i) 2; [1]

(ii) *Max. one mark for a list of where. Requires some description of clustering, so two clusters described and a list of others would give max. three marks.*

not evenly spread;
mainly close to coasts;
some clusters such as south of N America (Gulf of Mexico); W Europe;
a few on W coast of Africa;
most in N hemisphere;
many / most in Atlantic (includes Gulf of Mexico); [3]

(iii) mainly on shipping routes;
more likely near to where oil produced;
or where it is to be used; [3]

(iv) oil poisons marine life;
reduces ability of gills to absorb oxygen;
and causes them to die;
oil penetrates feathers of sea birds;
so they no longer insulate birds / cannot fly;
can blind birds / fish / sea mammals; so they cannot find their prey;
affects ability to smell; so cannot find prey;
blocks filter feeding apparatus, e.g. corals;
layer on surface blocks sunlight;
so reducing photosynthesis;
and reducing gaseous exchange / oxygenation;
disrupts food chain; [4]

(d) Two marks for accurate pie graph.
One mark if one or two sectors inaccurate.
One mark for correctly completed key. [3]

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(e) Indicative content:

Wide variety of ideas to be explored, such as:

Ocean currents and winds cause pollution to spread (required for top level).
Pollution caused by all nations bordering oceans and by landlocked countries via rivers and wind.
Outside territorial waters there is no individual country ownership of or responsibility for the ocean / sea.
Ships often under 'flags of convenience' so little control by that nation.
Often hard to identify polluter so all need to take responsibility.
Many nations need the oceans resources of fish so all need to work together to preserve environment.

Do not expect Level 3 answers to cover all aspects. Mark on quality of response.

Level 3 5–6 marks

Answers the question and provides at least two reasons explained well or three in less detail. Must cover the fact that pollution is spread to all parts of the oceans no matter where it originates.

Level 2 3–4 marks

Some detail of at least two reasons with some explanation. If both done well the answer will reach the top of the level.

Level 1 1–2 marks

Basic descriptive points with little or no explanation. May just be a list or one good point.

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

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2 (a) (i) 380–390 ppm [1]

(ii) temperature: 20 °C;
how long ago it occurred: 125 000 to 130 000 years ago; [2]

(iii) similar shapes / when one goes up or down so does the other;
recent increase in CO_2 not matched by such a large temperature increase; [2]

(b) (i) Two marks for all four correct.
One mark for two or three correct. [2]

(ii) largely dependent on fossil fuels / example of a fossil fuel;
which contain a large amount of carbon;
which when burnt produces CO_2,

May answer in terms of why renewables / nuclear unable to provide sufficient electricity, or are costly for max. two marks. [3]

(c) (i) doubled / 4 billion tonnes / from 4 to 8 billion tonnes; [1]

(ii) all increased;
largest / massive increase in Asian emissions;
small increase in Europe and / or in N America;
others more than doubled;
S America and Oceania and Africa still small emissions but much larger than in 1970;

Max. one mark on data.
Max. one mark if just a list with no comparisons. [4]

(iii) *Must be able to be seen as possible strategies. Allow development marks.*

change to renewables / nuclear for electricity generation;
increased efficiency of engines;
insulation to reduce heat loss and energy demand;
recycling materials uses less energy than primary processing;
public transport policy;
banning of old vehicles;
policy for reducing deforestation;
etc.

Two points well explained can achieve all four marks. [4]

(d) (i) fuel derived from prehistoric / ancient plants and animals;
formed by anaerobic decay / heat / pressure;
carbon (hydrocarbon) based; [2]

(ii) two from oil (petroleum), coal, gas; [1]

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(e) (i) soil / overburden stripped away;
loosened by explosives;
mineral extracted using diggers / mechanical shovels / etc.;
taken away by trucks; [2]

(ii) visual pollution;
waste heaps;
noise pollution from blasting / machinery;
loss of habitat / wildlife;
atmospheric pollution / dust;
transport of mineral causing air pollution;
pollutants seeping into groundwater / lake / rivers; [4]

(f) (i) does not produce carbon dioxide / contribute to enhanced greenhouse effect;
less transport of fuel needed; [2]

(ii) in favour because:
provides employment;
and social / economic benefits as a result;
provides power supply;

against because:
risk of leaks / accidents;
so releasing radioactive materials / radiation;
radioactive waste problem;
which may cause cancer / illness / death;

Max. three marks on either side of the debate. [4]

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(g) Indicative content for:
Long lasting supplies.
Fossil fuels diminishing rapidly.
Renewables such as solar or wind not reliable.
Access to resources not a limiting factor for siting.
Biofuels cannot meet demand.

Indicative content against:
No solution to waste problems.
Risk of leak, accidents, terrorism.
Expensive to build and decommission.

Do not expect Level 3 answers to cover all aspects. Mark on quality of response.

Level 3 5–6 marks

Answers the question and provides at least two reasons explained well or three in less detail. Must look at both sides of the argument.

Level 2 3–4 marks

Some detail of at least two reasons for and/or against. May answer the question but provide only reasons with limited development.

Level 1 1–2 marks

Basic descriptive points with little or no reasoning. May just be a list of for and / or against

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

[Total: 80]

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