

MARK SCHEME for the October/November 2007 question paper

0680 ENVIRONMENTAL MANAGEMENT

0680/02

Paper 2, maximum raw mark 80

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.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

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- 1 (a) (i) 1000 million
- (ii) The only continent with a decrease
- (iii) Africa [1]
- (b) (i) Frame drawn and bars used = 1 mark
Accurate plots for China = 1 mark
Accurate plots for India = 1 mark [3]
- (ii) India overtakes China as the largest country [1]
- (iii) Possible reasons for low population growth
- Government implements population policy e.g. '1-child' in China
 - Increased use of family planning / provision of clinics in rural areas
 - Social changes e.g. improvements in education of women
 - Economic development changes attitudes towards children
 - References to migration or increased death rates (e.g. from AIDs) could also be relevant (since it is population growth, not just birth rate)

Possible reasons for higher population growth in other countries are largely the opposites of those given above. The emphasis should be on reasons why high birth rates persist, for which poverty and culture, (including the role of women in society and religion), are very significant factors.

Credit references to both higher and lower for the same reason, provided that they are stated in a two sided manner.

Reward depth especially if provided by use of a relevant example.

Mark according to overall worth of the answer;

- Answer worth 1 or 2 marks
It may be over-dependent upon use of one reason, unsupported by detail or reference to an example. Or a number of reasons are given, but almost list-like without elaboration or comment towards the question theme.
- Answer worth 3 or 4 marks
Reasons for low population growth given with some development; an example might be used in better answers. More likely to refer to low population growth than to lower population growth (i.e. the relative element isn't included).
- Answer worth 5 or 6 marks
Effectively conveys reasons why population growth is lower in some/higher in others; use or reference to examples will help for full marks. [6]

- (c) In sub-Saharan Africa income per head has gone down and % living on less than a dollar a day has increased, whereas in Asia (both South and East) both measures have improved, income in sub-Saharan Africa has fallen by about 300 dollars, from being the richest among the three before 1980 it is now the poorest, numbers on less than a dollar a day have gone up 1-2% in sub-Saharan Africa, whereas they have halved/fallen from 30% to 15% in East Asia, so that sub-Saharan Africa moves backwards while Asia makes economic progress.

General points (such as 1, 2 and 7 above) = maximum 3 marks

Use of values from both graphs (relevant to question theme) = maximum 4 marks [5]

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- (d) (i) 25% sector/90° angle shown in pie graph for hunger, attempt to show tiny p (not more than 5°) in health workers pie graph, key completed with shading identify sub-Saharan Africa as the minimum. 3 @ 1mark
- (ii) % of health workers is tiny compared with number of people, inadequate/non-existent health services means that diseases will spread, hungry people have less resistance to disease than those well-fed, young and old are ones who are most vulnerable.

Points made along these lines 3 @ 1 mark [3]

- (e) cycle keeps repeating itself/once it starts it becomes self-perpetuating, often help/investment from outside source (e.g. government, charity) is needed, examples of outside help that cannot be afforded by poor people (e.g. well, clinic).

Poverty trap idea shown to be well understood = 2 marks
Some understanding/only one basic point made = 1 mark [2]

- (f) (i) Food aid is the least good choice; it could be justified only as a short term measure to feed people, build up strength and improve resistance to disease. Max 1 mark

Development aid is probably the best choice for this question because it addresses 'no access to clean drinking water. Examples of water related diseases that reduce capacity to work could be given or comment could be made about why well water is usually safe – up to 3 marks

Farm aid is the middle choice, likely to lead to 1 or 2 mark answers. The best explanation would be in terms of increasing food supply and improving resistance to disease; increased income would generate income for improvements e.g. wells.

Minimum 2 marks, maximum 3 marks for this part

- (ii) Food aid is the obvious answer here because it solves an immediate problem, but does not address the underlying problems of unsafe water, much disease and low food output – up to 3 marks, including 1 mark for choices made if it follows from development aid above.

Farm aid is again a middle choice.

Minimum 2 marks, maximum 3 marks for this part [4]

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(g) (i)

- Only a few trees, haphazardly distributed (– so unlikely to give shelter against wind)
- Some steep slopes, many variations in relief (– more likely that soil will move down slope after rain)
- Bare ground can be seen in places e.g. middle and bottom left (– no protection for ground against wind and rain)
- General absence of vegetation cover, even in the fields

All marks can be obtained by describing physical features as asked by the question; in the best answers there will be some attempt to locate or give an idea of extent. Reward elaboration which places the observation in context for soil erosion similar to the comments in brackets above; however, it must start with description to be credited.

Any mixture of 1 mark (description) and 2 mark (description + context) answers up to 4 marks. [4]

(ii) Terraces = 1 mark

2nd mark for describing location or extent, or for elaboration such as the creation of level land on sloping terrain [2]

(iii) Other relevant soil conservation strategies named in syllabus are tree planting, contour ploughing, dry land farming and windbreaks. Also, if the terraces were not recognised in part (ii) above, they could be used here.

Name of strategy plus description = 2 marks. Most likely 2 + 2 marks for two strategies. Allow 3 + 1 marks if one strategy is well described in relation to area shown on photo [4]

[Total: 40]

2 (a) (i) sedimentary clearly selected [1]

(ii) decomposition of plants and dead creatures [1]

(iii) Anticline/upfold in rocks,
sandstone is a permeable/porous rock,
trapped between impermeable clay layers,
oil present towards the top of the rock layer above denser water.

Three points made along these lines. [3]

(iv) Drill down vertically from surface above,
oil derrick erected on the surface,
pipes are drilled into the ground until oil is reached, oil forced out by pressure/forcing down liquids.

Three points made along these lines. [3]

(v) explosions/blow-outs/wells catching fire [1]

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(b) (i) minus 12.4 / 12

(ii) plus 19.2 / 20
Third mark for making clear the negative/positive

(iii) Demand exceeds supply in the three developed regions, sometimes by a considerable amount / values used, although supply exceeds demand in all three developing regions, amount of supply and size of the difference are greatest in the Middle East, Middle East has amount to supply developed regions without oil like Japan.

Points made should be directed towards the Middle East theme in the question.
Three points along these lines

[3]

(iv) The answer can be based around one tanker or pipeline disaster, or it can be general with passing mention of an example (either local or internationally well-known such as the Exxon Valdez in Alaska)

Initial damage from marine pollution – birds and fish die as a result of ingesting oil, being coated in it, marine and plant life is damaged, beaches are covered thereby ruining both marine and coastal ecosystems.

Land pollution from pipelines – additionally oil can seep into the ground and find its way into rivers used for water supply.

Max. 2 marks without any references to areas or an example

Max. 3 with just a passing reference to an example

4 mark answers should contain precise information for the chosen example

[4]

(v) Relevant factors are

- size of the spill
- how close it is to populated areas/clean-up services
- wealth of country/effectiveness of clean-up operations
- speed with which clean-up operations begin
- natural conditions/type of environment e.g. slower repair to damage in cold environments, stormy seas can break up spills more quickly, whether wind direction/ currents take the spill towards or away from land

Points made along these lines for at least two factors.

For 4 marks some reference needs to be included to the comparative element i.e. it is best if factors are stated in a two-sided manner

[4]

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- (c) (i) Tundra climate – very cold winters, cold summers, little precipitation, most falls in winter. Figures used to illustrate these e.g. -40°C in winter, never more than 10°C in summer, under 250 mm total precipitation.

Min. 1 mark Max. 2 marks for any of the points made above

Tundra vegetation – absence of trees, surface cover dominated by mosses/lichens/grasses, summer bloom mats of flowers, all plants short/close to ground, examples of named plants e.g. dwarf willow, cotton grass

Min. 1 mark Max. 2 marks for any of points made above [3]

- (ii) Fewer than 300 people, tiny in relation to size of area/use of scale/covers hundreds of sq. km., Inuits mainly live by hunting, fishing and whaling, activities which use natural resources/no industry or cultivation, only one settlement shown – Katovik on the coast, area lies north of the Arctic Circle so will have a cold climate, types of animals such as polar bears, arctic foxes etc. confirm coldness, National Wildlife Refuge created to control / keep out human settlement.

Four points made along these lines = 4 @ 1 mark.
Some points are capable of elaboration and development into two mark points, such as taking together points one and two in the scheme. [4]

- (d) (i) Economic arguments
- Increases domestic reserves of oil meaning less dependence on imports
 - USA is an energy-hungry country which needs the oil
 - Provides work for Inuit people/local people in area where other work opportunities are scarce/not successful/difficult to create

Minimum 3 marks Maximum 4 marks

Environmental arguments

- Modern methods of drilling are far less damaging to the environment
- Will affect only a tiny part of Alaska so that plenty of untouched environments will remain/only 0.7 m hectares out of 7.7 – less than 10% of area

Minimum 2 marks Maximum 3 marks [5]

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- (ii) There are no marks for repeating the arguments; marks are for comment.
- Need for oil in the USA – already seen great gap between supply and demand in North America, how reliable is dependence on places such as the Middle East for supplies, the economic argument for more domestic supplies of oil are strong
 - Needs of local people for economic opportunities are great, hence support from an Inuit and the Senator from Alaska
 - Creation of other economic activities would save whales and other animals from being hunted
 - How worthwhile is permanent/long-term environmental damage for short-term economic gain? Is it worth it?
 - The oil industry does not have a high reputation for avoiding spills e.g. nearby at Prudhoe Bay in Alaska. Oil spills can affect a much wider area and the oil has to be transported out
 - Some environmentalists want to stop all developments, even when only a tiny area will be affected/won't allow any new economic developments

These are merely examples of some of the comment that could be made/lines of argument used. Mark according to the overall worth of the answer.

- Answer worth 1–2 marks
Limited comment without an opinion being clearly expressed or supported. Alternatively an opinion may be stated (and perhaps restated) without strong support.
- Answer worth 3–4 marks
Opinion or views made clear so that worthwhile arguments can be used to support them. The answer may be heavily dependent upon just one or perhaps two lines of thought.
- Answer worth 5 marks
Clear approach to answering; answer supported by comment using two or more of the approaches suggested above. Thought and understanding of the issue show through. [5]

[Total: 40]