CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2

0680 ENVIRONMENTAL MANAGEMENT

0680/22 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, 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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

1 (a) (i) 1800

(ii) persistent but steady increase until 1900,
noticeable increase in rate / speed of population growth b
population take-off from 1950 / 60 onwards,
this very rapid growth continued to 2011 to take the popul
use of values which support acceptable statements such
1960 to 2011 / more the doubled in 50 years

Three descriptive points made along these lines = 3 @ 1

(b) (i) **A** – continuation of current high rates of growth / no let-up in high rates of growth, taking total population to 15 billion
B – continued high rates of growth until about 2050 / 60, then signs of a slow down so that the population only reaches 10 billion by 2100
C – population peaks around 2030 / 40 and then goes into decline so that it falls below the current value / down to 6 billion by 2100.

Totals in 2100 given without any supporting description = 1 mark
Description of lines without reference to population totals, or accurate totals with limited descriptive support = max. 2 marks
Mixture of description and use of totals = up to 3 marks **[3]**

(ii) general point(s) made about them all being estimates and nothing more,
no one really knows what is going to happen to fertility rates in future.

more specific points about the assumptions on which the three estimates are based.
A based on the assumption that the trend of high rates of natural increase seen from 1960 will carry on throughout the next 90 years,

B based on the knowledge that there are already signs in some developing countries of family size coming down, especially those making progress with economic development, much in the same way that happened previously in developed countries (hence the stages in the Demographic Transition Model),

C relies upon some change / catastrophe causing a great increase in death rates, such as crop failures, massive droughts, significant climate change or new infections in the way that AIDS / HIV once threatened to increase mortality rates significantly.

Simple statements showing some understanding, perhaps more general than specific, or concentrating on only one of the estimates without a broader understanding being shown = 1 or 2 marks

Clear understanding about what these population estimates are showing and that estimates / opinions vary = 3 marks **[3]**

(iii) **B** is the easiest choice – because it is more closely relat happening already; in global terms fertility rates / birth ra is even natural decrease in a few countries in Europe.

for **A**, the candidate would have to put forward optimistic world food supply and technological breakthroughs to supported on the Earth's surface by its natural resources.

for **C**, suggestions would be needed for what will force th trends – disasters could be tectonic, climatic, disease re or both, exhaustion of natural resources.

No marks for choice; both marks for explaining why. Mark on the basis of the strength and precision of the reasoning.

[2]

(c) (i) 40 years **[1]**

(ii) the most obvious answer is improved medical treatment / examples of primary and secondary healthcare can be given to support this, leading to a great reduction in death rates worldwide.

1 mark for choice, 2nd mark for some further explanation

also allow the choice of wealth / poverty, especially if the supporting explanation leads to references on access to medical treatment. **[2]**

(iii) if not used in **(ii)**, wealth and poverty which control access to medical care; also wealth increases access to better diet, clean water and sanitation and improved living conditions. Where these do not exist, notably in rural areas of poor developing countries, death rates tend to be high.

other factors to explain low life expectancies include:
– wars / civil and political unrest, which disrupt normal living, faming, access to clean water supplies, make worse the effects of natural disasters / classic current example is Somalia with civil wars and drought.
– diseases for which treatment is not available or cannot be afforded, such as HIV / AIDS, which has greatly reduced life expectancies in many southern African countries such as Botswana and South Africa.
– special factors such as high rates of alcohol consumption in Russia and some of the other old Soviet Republics.

Points made along these lines; references to at least a second cause for all three marks.

[3]

(d) (i) Japan's pyramid is taller / Nigeria's is shorter,
Japan's is more straight up and down / rectangular represented,
Nigeria's is more of a pyramid / has a wide base and narr

Descriptions such as these about overall shape, as o shape; the statement can be precise for one country and for the other country to bring out a difference.

Two valid differences in shape = 2 @ 1 mark

(ii) both males and females needed to be shaded in both graphs. **[1]**

(iii) old and young are the non-working population / they are dependents,
15–64 year olds are working population / the independent population,
they provide the revenue / pay taxes to pay for pensions and schools for 65+ and under 15.

Some understanding = 1 mark
Clearer and fuller understanding of the difference = 2 marks **[2]**

(iv) 42% **[1]**

(v) disadvantages: young are expensive in terms of their needs for public services, such as health and education
– young people grow up and marry / reach child bearing age; large numbers of them mean that population increase is likely to continue in the country for many more years, increasing the pressure of numbers
– problem of numbers puts a great strain on a country's economic resources; food output, services and industry need to increase just to keep the country and its people on the same economic level as previously; in rural areas large numbers of young people to feed increases pressure on the land and natural environment.
Maintains the poverty trap among poor people in rural areas.

Advantages: today's young are tomorrow's human resources for a country; their efforts and energy will be needed for future economic development; young are more likely to be willing to change, and adopt new technology as it becomes available. Many a country benefits from remittances from young people reaching working age and going overseas to work. Might allow a country's empty areas to be settled and their resources developed.

Minimum of 1 mark reserved for advantages and disadvantages.
Otherwise 4 @ 1 mark. **[4]**

(vi) conclusion 'disadvantage': best justified not in terms of continuing future population pressure on resources – fin to be shared between greater numbers of people. economically developed countries mean a larger share o people and therefore greater wealth.

conclusion 'advantage': supported by reference to the ne the future wealth of a country; a big problem in deve children to support their ageing populations by creating t needed for state pensions. Some governments still b numbers increase a country's international status and power e.g. the big populations in China and India mean that they cannot be ignored internationally.

No mark for the view – up to 2 marks for how well the view is supported. **[2]**

(e) (i) increasing percentage of old people (65+) in a country
If not as precise as this, idea of large numbers / proportion must be included **[1]**

(ii) bars divided up correctly for stated percentages = 2 @ 1 mark
sectors identified in the bars and key = 1 mark **[3]**

(iii) tradition in developed countries that people are given pensions once they retire from work; many pensions are paid by governments. Money that governments have mainly comes from taxes; as the percentage of retired people increases, the percentage of those working and paying taxes decreases i.e. less money is coming when more needs to be paid out.
health and other care costs increase as people get older and live longer; for many old people this means reliance on government provision. Forecasts about future population structures in Japan and Europe suggest that future economic problems are set to worsen.

3 points made along these lines = 3 @ 1 mark **[3]**

(iv) candidates could sit on a fence, or even argue in favour of the UK, from the point of view of population structure in 2010; both have the same percentages above 60 and the UK has 4% fewer of its population of working age.

Maximum 1 mark for this

the key evidence which supports the answer Japan is the much lower fertility and birth rates, also lower percentage of under 15s already in 2010 (4% lower). This population data suggests a progressive decrease in the percentage of potentially economically productive 15–60 year olds during the next 15 years, who are the key economic providers for government costs to support old people.

credit comment along these lines in the terms of the future, as well as use of the data in support of the answer.
Up to 3 marks for this **[3]**

[Total: 40]

2 (a) (i) D condensation
E precipitation
F percolation
G groundwater flow
H surface run-off
I evaporation
J transpiration

All 7 correct = 3 marks
4–6 correct = 2 marks
2–3 correct = 1 mark **[3]**

(ii) rocks below level of water table are saturated,
may be useful for underground / groundwater sources of water such as aquifers / wells,
supplies clean water for drinking / fresh water for irrigation,
if it touches the surface spring water may reach the surface naturally,
if surface is saturated in lowland areas may lead to surface flooding,
adverse consequences of this for people.

Two points made such as these = 2 @ 1 mark **[2]**

(iii) rainfall / precipitation **[1]**

(iv) steep sided / narrow / mountain valley,
explanation why this is better for dam building and reservoir construction,
steep slopes around it for fast surface run-off of rainfall,
mountain references in terms of higher precipitation / melting snow.

Two explanatory points = 2 @ 1 mark **[2]**

(b) (i) name of dam and its location, anywhere in world. Most likely examples include Aswan High Dam in Egypt, one of the large dams in the west of the USA such as the Hoover Dam, large dams on the upper Indus in Pakistan such as Tarbela Dam, Three Gorges dam on the Yangtse in China. **[1]**

(ii) source of fresh water supplies / domestic uses,
recreational activities such as sailing / tourist activities,
food source from fishing.

Two uses = 2 @ 1 mark **[2]**

(iii) hydro-electric power / electricity **[1]**

(iv) for irrigation / growing crops,
with further details about it such as reference to the canal and regular pattern of water channels leading the water into the fields.

2 @ 1 mark **[2]**

(c) (i) lost their farmland and thus their source of income / liveli
often given replacement land elsewhere which is of inferi
land on valley floors is often the flattest and most fertile l
living community of people broken up / destroyed / forced
may be forced to move a long distance from known peop

Minimum of 1 mark reserved for each of economic and s
Otherwise 3 points made along these lines = 3 @ 1 mark

(ii) loss of land in valley floor / on lower slopes will lead to g
valley sides,
this is steeper / less productive land naturally more at risk from soil erosion,
pressure of people looking for farmland in the same area will lead to over-use,
over-cultivation / overgrazing / clearance of vegetation all speed up soil erosion,
soil sediment / pollution waste / fertilisers will enter mountain streams and be transferred downslope to the reservoir.

Three points such as these showing understanding of the possible knock-on effects.

3 @ 1 mark **[3]**

(iii) accumulation of sediments behind the dam, resulting reductions with time in the volume of water that can be held in the reservoir, life expectancy reduced even faster if catchment areas for the streams are over-used by people, leading to increased surface run-off.

The dam being a solid wall traps all the sediment behind it, whereas previously it was progressively carried downstream by the river and deposited in the sea. In other words, dams interfere with natural river processes.

Understood (however expressed) and well explained = 2 marks
Some understanding, but probably with a great dependence on the content of boxes R & S = 1 mark **[2]**

(d) (i) environmental:
Many river channels / water everywhere (total width 5k
one water channel in 2010 (only 300m wide, many times
Water replaced by deposits of sand where river channels
Soil characteristics have changed; silt soils, kept fertile
replaced by brackish soils.
Falling water levels in the soil.

economic:
Livelihoods of delta dwellers have disappeared. No more
only chance is to go out to sea to fish. Water no longer available for crop farming,
not enough river water and water levels too low for pumps to work. Most crops will not grow in salty soils. Forced into less profitable alternatives such as collecting firewood.

Incomplete / part answer. Relies on direct use made of information given in the table.
Content selected not always successfully arranged under the headings environmental and economic = 1 or 2 marks

Complete answer in terms of use of what is in the table and correctly arranged under the headings environmental and economic = 3 marks

Not only complete, but better described in terms of using headings or language which helps to emphasise the scale and range of the problems caused = 4 marks **[4]**

(ii) population decrease (from 15,000 to 3,000) **[1]**

(iii) the clearest push factor is the loss of employment with the disappearance of jobs in river fishing and difficulties in farming after the loss in water supplies,
future for farming looks gloomy after loss of regular fertile silt deposits and soils being affected by higher salt content,
collecting firewood is a sign of how bad things are / not likely to be a sustainable activity and all the consequences that follow from loss of livelihoods

there are always going to be the pull factors of the cities which can offer things that the countryside cannot – such as better services (education / medical), more chances of electricity and access to clean water, more variety and greater range of job types.

General answers or answers limited to only one push factor = 1 mark
Answers specific to this example including fuller references to push factors = 2 marks
Answers which support the view that push factors are likely to be dominant in this example, backed up strongly or in a balanced way with comment; comment may also refer to increasing attractiveness of the city = 3 marks **[3]**

(iv) the easiest view to support is highly likely due to fur deteriorating soils, falling water supplies, over-use of fire

also since the dams are in place much further north o seem much chance that more water will be released chance that there might be even less.

once the community disappears, more likely to leave / s friends in the cities to make the move easier. Communi people of working age have migrated.

support for unlikely to decline further is less obvious / but the 3000 might represent the number that can be supported by current resources and activities like sea fishing and collecting firewood. All those with any desire to migrate have already done so.

View expressed but weakly supported = 1 mark
View expressed and more strongly supported = 2 marks **[2]**

(e) (i) the obvious focus is on squatter settlements / slum housing / shanty towns,
self-help housing using mixed 'building materials',
high density / haphazard layout,
lacking in essential public services such as water supply,
overcrowded / easy spread of disease,
located in inferior locations not already used for formal housing.

possible also to refer to the high costs of modern housing such as apartment blocks supposedly built for the poor.

Points made along these lines. Credit any references to specific examples.
3 @ 1 mark

[3]

(ii) an example from a big city in the country where the candidate lives, textbook examples such as Chennai and the Housing and Slum Clearance Boards, the Orangi Pilot Project in Karachi involving the communities in self-help schemes, and the 'new settlement' policy in Greater Cairo.

most strategies for improving housing are of the ASH (aided self-help) type, giving legal titles to the land, providing essential services, offering loans and providing technical help. Less successful are those that involve clearance and housing redevelopment (usually high-rise) in another part of the city, often some distance away. Bulldozing without any new provision.

Answer about strategies for managing housing problems; many will be general in nature and weakly related to a city even when one is named
– Maximum 3 marks for these answers, with the mark within the range dependent on the dependent on amount given or range of points made. General answers.

Answers that contain direct and identifiable references to a named city
– Up to 5 marks with adequate supporting detail. City specific answers. **[5]**

[Total: 40]