AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

General Certificate of Education

Environmental Studies   1441

ENVS2   The Physical Environment

Report on the Examination

2009 examination - June series

General

There is a change in emphasis in the new specification and the associated examinations towards the application of the subject and away from abstract concepts with no direct application to real situations. This seems to have made the examinations more accessible with almost all candidates attempting all questions. However, the need to answer the questions precisely with appropriate scientific terminology meant the examinations were not easier.

Although this was the first ENVS2 examination, candidates found it to be accessible and the answers given showed that many candidates were well prepared for the examination using appropriate vocabulary, supported with good examples.

Most candidates were guided by command words such as *describe*, *explain* and *suggest* to give answers that were accurately based on the question set. Others ignored or misinterpreted the command words and gave answers that may have been related to the question but gained no marks.

Question 1

Most candidates appeared to know the answers to most sections but many lost marks by giving imprecise or partial answers, usually caused by ignoring the column headings 'Natural process...' 'Human activity...' and 'Method or regulation...'. For example, for the production of methane, 'cows', is not a process, nor are 'landfill sites' natural. The key issue in all the processes is anaerobic digestion.
For CFCs candidates had to give the human activity that caused the release of CFCs. The use of fridges does not cause their release although their disposal does.

Question 2

(a)   This was well answered with most candidates referring to both thermal expansion and the melting of land ice. However some failed to gain the second mark by failing to make it clear that the melting ice was on land.
Some candidates believed that thermal expansion involves the enlargement of individual water molecules, rather than their vibration increasing the space between.
Increased rainfall has no impact on sea level as it is balanced by increased evaporation.
(b)   Few candidates gained full marks, often because descriptions were vague, for example by not stating why the existing species cannot survive the new conditions. Better answers referred to changes in named abiotic factors. The change in total area of land or sea is irrelevant, but the changes in areas of coastal habitats is significant.
(c)   Many answers correctly referred to changes in wind direction and velocity. Better answers named specific currents. Very few mentioned changes in water salinity and density.Some candidates ignored the focus on ocean current change and talked about the general impacts of global climate change.

Question 3

(a)   About half the candidates understood that higher market prices increase the area that can be mined profitably (because it becomes economic to exploit lower grade ores)

(b)   This question illustrates the importance of reading the question carefully. Some candidates referred to ore purity and prices, despite being instructed not to. Some also failed to relate their answers to economic viability, often concentrating on land use conflicts.

(c)   This was generally well answered although the technical terminology used to describe the reduction methods was often poor.

(d)   Almost ¾ of the candidates named an appropriate method, but very few gained the second mark by precisely describing how it would increase future metal supplies.

Question 4

(a)   Few candidates understood that the density of water decreases as it cools and hardly any knew that this occurs below 4° C.

(b)   Many candidates understood that the change in density causes ice to float and that this prevents the water below from freezing. Few candidates explained why this is important to aquatic life.

(c)   Almost all candidates correctly calculated the residence time.

(d)   Most candidates understood that a dynamic equilibrium involves balancing processes but fewer gave examples of processes from the water cycle.

(e)   Some candidates clearly had no experience of measuring soil water content and made up methods such as squeezing the water out.
Most candidates described a drying procedure with appropriate times, temperature and reference to reweighing until constant weight is reached.

Question 5

(a)   This was generally well answered, although only the better candidates used technical terminology such as catchment area, surface area:volume ratio and rock stability or seismic activity.

(b)   Many candidates knew the purpose of screens and the process that reduces turbidity, but few were familiar with activated carbon/charcoal filters or could descibe the principles of flocculation.

(c)   About half the candidates could name a suitable method and many could give good descriptive comments, but about ¼ of candidates gained no marks.

Question 6

(a)   Few candidates completed the diagram with a suitable process and ammonia/ ammonium.

(b)   This proved to be the hardest question on the paper. Very few candidates understood that the drainage of waterlogged soils would create the aerobic conditions that would reduce bacterial denitrification while increasing bacterial fixation, thus increasing soil nitrate levels. This is a major reason for farmers draining their fields.

(c)   Many candidates understood that phosphates cause algal blooms but could not relate this to an environmental problem, often stating that the algae consume oxygen. Better candidates described a clear sequence of events.

Question 7

(a)(i) and (ii)
Although many candidates understood that increasing altitude is related to declining temperature in the troposphere and increasing temperature in the stratosphere, few could relate this to the source of the energy and the type of energy involved: IR from the Earth in the troposphere and UV from the Sun in the stratosphere.

(b)   (i)   Many candidates gave good descriptions of the role of CFCs and the chlorine that is released on the chemical reactions in the ozone layer.
Poorer answers confused ozone depletion with global climate change.

(b)   (ii)   This was well answered with most candidates stating that more UV would reach the Earth and how this would affect living organisms.

Question 8

(a)   Many candidates just described the trend. No specific knowledge of individual countries was expected. Credit was given to any variable that may place a country away from the trend such as high levels of a named water-using industry, a lack of awareness of the need to conserve water or a hot, dry climate requiring greater use of water for crop irrigation.

(b)   This was generally well answered with a range of suggestions such as low flush toilets, behavioural changes and grey water use.

(c)   This was generally poorly answered. Many candidates gave simplistic answers related to droughts and deaths but failed to explain how a general shortage of water for agricultural, domestic or industrial uses could inhibit specific aspects of development.

Question 9

(a)   Most candidates gained some credit but only better answers gave details in a logical sequence or reference to the particle sizes or order of separation of sand, silt and clay particles.

(b)(i)(ii)It was pleasing to see that almost all candidates could use a soil triangle.

(c)   Many candidates gave good answers which showed how the impact of ploughing could be investigated and how the impact of other factors could be identified. Only better candidates included details of general scientific methodology such as taking multiple samples, standardised techniques, sample timing and sample locations.

Only a few candidates gained both marks by using appropriate technical terminology combined with good written communication skills.

Mark Ranges and Award of Grades
Grade boundaries and cumulative percentage grades are available on the **Results statistics** page of the AQA Website.