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General Certificate of Education

Environmental Studies 1441

ENVS2 The Physical Environment

Report on the Examination

2010 examination - January series

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General

This proved to be an accessible examination paper with most candidates attempting all parts of all questions. Many candidates had been well prepared and scored high marks through the accurate interpretation of the question and the use of appropriate scientific terminology.

Question 1

Most candidates scored highly on this question, although the methods used to reduce the problems of acidic leachate were less well known.

Question 2

(a) Better answers were related to why supplies in the south and east could not satisfy the demand, usually referring to high population, arable irrigation, low rainfall and affluence-related consumption. The higher rainfall in the north and west is not, in itself, a reason for transfers, unless it is linked to shortages elsewhere.

(b) Many candidates gave good answers, although descriptions of which rock property relates to which structure were often rather jumbled.

(c) Many candidates clearly understood the dynamic equilibrium of recharge and discharge/abstraction, with good descriptions of subsidence, salt water incursions and a lowered water table. Descriptions of ecological changes to surface features such as wetlands were often very vague.

(d) Many answers were rather vague with undeveloped statements such as 'cheaper' or 'less damage' with no description of what would have cost money or how damage may occur.

Question 3

(a) Descriptions of how turbidity and pathogens were removed were generally good, however fewer understood how activated carbon filters are used to remove organic substances such as pesticides. Of those that named the right method, very few could describe how substances adsorb onto the carbon particles.

(b) The impact of a lack of clean water on health-related issues such as disease, life expectancy and the ability to work and contribute to the economy was well understood. The need for water of suitable quality in adequate amounts for agriculture and industry was less well understood, with very few explaining how the water would have been used.

Question 4

(a) The majority of candidates gained full marks with the most common mistake being to swap temperature and atmospheric pressure.

(b) Most candidates understood that ozone absorbs UV in the stratosphere but fewer understood that infra red energy is emitted from the Earth then absorbed by greenhouse gases. Poor terminology was common such as 'reflected', 'filtered', 'blocked' and 'bounced off'.

(c) A minority of students gave good answers. A simple lack of knowledge caused some low marks, while others confused fusion with fission. Some candidates misinterpreted the question and described how plants absorb sunlight during photosynthesis which then drives food chains.

Question 5

This question was generally poorly answered with a minority having a clear understanding of the processes involved or the terminology to use.

(a) While some candidates gained marks for including processes such as cooling and crystallisation, few could relate these to named processes such as hydrothermal processes. Very few named specific ores.

(b) Some candidates misinterpreted the question by referring to extraction techniques. Only better answers gave named exploration techniques supported by a brief description of how they work.

(c) Better answers distinguished between reserves and resources in terms of whether

- Exploitation is hypothetically possible or economically viable now with existing technology.

(d) Very few candidates knew that 'chemical form' relates to the other elements with which the metal is combined. No chemical details were expected, but an awareness that different combinations produce compounds from which the metals that can be extracted with different degrees of ease. Better answers gave two ore compounds or materials of the same metal, such as clay and bauxite for aluminium.

(e) Methods used to exploit low-grade ores were not generally understood, despite their increasing importance as richer deposits are exhausted. Open cast mining was the most commonly quoted method with the economies of scale allowing economic exploitation or deeper excavation. Electrolysis of spoil drainage water was mentioned by some candidates.

Question 6

(a) While many candidates understood that the cut-off ore grade related to the limit of viability but not that it is the lowest concentration or that the viability relates to economics.

(b) The majority of candidates knew that mechanisation increased the amount of ore that could be mined and most could explain this, usually referring to reduced labour costs or the ability to exploit deeper deposits.

(c) Candidates gained credit for answers based on two different approaches: increased competition from increased mining in China/India or increased demand for tin from South Crofty. Better answers referred to changes in market price and the cut-off ore grade.

(d) Two basic methods were given credit: the use of electronic meters and the colour change of an indicator. Very few candidates who referred to electronic meters mentioned the need for calibration to ensure accuracy. A minority described the use of litmus paper which would not indicate the actual pH.

Question 7

(a) (b) Almost all candidates could accurately read the soil triangle.

(c) This question was answered poorly by many candidates, who often omitted critically important features such as the use of dry soil, heating within a specific temperature range or heating to constant mass.

(d) Relatively few candidates understood the importance of soil bacteria in a wide range of processes that affect soil fertility, especially in biogeochemical cycles. Poorer answers referred to bacteria as if they are all pathogens.

Question 8

(a) Many candidates could not identify how the shape of the graph is produced by balancing processes that have rates that change over a 24 hour period.

(b) This question was generally well answered although some candidates lost marks by giving two activities that were too similar to each other.

(c) This was poorly answered with most candidates gaining no marks. Very general statements such as 'make sure it is a fair test', 'collect reliable results' or 'follow instructions carefully' gain no marks.

Question 9

(a) Many candidates lost marks by failing to refer to specific altitudes or by only referring to the graph for one year.

(b) This question was well answered by most candidates.

(c) Better answers gave a range of methods involving legislation, alternative materials and alternative processes. A pleasing number supported their answers with appropriate examples. A small minority referred to the disposal of waste CFCs and very few gave a suitable disposal technique such as incineration.

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