

A-level

Environmental Studies

ENVS2: The Physical Environment
Report on the Examination

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General

This examination proved to have a similar level of demand and accessibility to previous papers. Better prepared students used appropriate technical terminology to support their descriptive answers. A pleasing number used good examples to illustrate principles.

Question 1

This was well answered with nearly 50% of students gaining four marks. The fact that nitrogen is produced by denitrifying bacteria was the least well known fact. A surprising number confused photosynthesis and respiration.

Question 2

- (a) Most students knew that reservoir storage would reduce turbidity and the need for sedimentation, but few could give a second process, such as sterilisation, that would be less necessary as pathogens may be killed by UV light or aerobic conditions.
- (b)(i) Most students knew that temperature extremes would be reduced around a large reservoir, but only 30% could explain this using scientific terminology, such as high specific heat capacity of water.
- (b)(ii) A minority of students clearly understood the term microclimate and gave clear answers related to changes in light levels, precipitation or wind velocity. A significant number gave general descriptions of habitat loss or flooding.

Question 3

- (a) About 50% of students gained the mark, usually by referring to the greater quantity of material that must be mined as the ore grade declines.
- (b) This was poorly answered. Less than 50% of students could select values for the energy needed to extract the two different ore grades and a small minority could use these to calculate the percentage increase in energy to extract copper from the lower ore grade.
- (c) Leachate collection followed by electrolysis was the most common correct answer. A sizeable minority incorrectly thought that low grade ores are deeper and therefore less accessible.
- (d) Nearly 75% of students gave a correct exploratory method, although far fewer could give a description of how it worked.
- (e) Many students understood that a higher market value would reduce the cut-off ore grade, but only the better answers gave accurate descriptions. While some knew that higher market value would increase profit margins, very few said that this would allow more money to be spent on processes such as mining, chemical extraction or refining.

Question 4

- (a) About 50% of students could select data from the diagram and use the formula to calculate the residence time of 190 years.
- (b)(i)/ (ii) Most students could give a human activity that would affect the movement of carbon between the reservoirs, but few could explain why the changes in movement occurred. The most common answers were ploughing/aeration for part (b)(i) and afforestation/deforestation for part (b)(ii).
- (c) The concept of negative feedback was well understood, but many students gave partial answers, such as only explaining how the equilibrium would be re-established after an increase in carbon dioxide concentrations, without giving the response to a reduction in carbon dioxide concentrations.

Question 5

- (a) Most students understood that the soil disturbance after the start of cultivation would increase the rate of decomposition. Better answers included descriptions of the action of detritivores and decomposers. Better answers also referred to the reduced amounts of DOM added to the soil surface as crops are harvested and removed.
- (b) This was generally well answered with about 75% of students getting two or more marks. The most common error was to include details of the method of estimating organic matter content, such as the use of a Bunsen burner or an excessively high temperature.
- (c) While this was generally well answered, a significant number gave vague descriptions with no clear understanding of how the timing of the collection could affect the results. Better answers referred to the effect of seasonal changes or the effects of weather, especially rainfall, and changes in evaporation caused by different temperatures.

Question 6

- (a)(i) Almost all students gained one mark for describing the overall decline in water levels. Far fewer gained a second mark for describing another trend such as the annual cycle in water levels or changes in the general rate of decline.
- (a)(ii) The most common correct answers related to over-abstraction for human use, such as irrigation, and the seasonal changes caused by different temperatures and precipitation rates.
- (b) Better answers gave good descriptions of salinisation and the osmotic problems that make crop growth impossible.
- (c) Most students scored well with good descriptions of the health benefits of having access to clean water, not just in terms of quality of life, but also in the ability to work and go to school. The ability to develop processes that use larger amounts of water were also commonly mentioned, although the examples chosen were often related to affluent MEDCs, such as swimming pools and dishwashers, rather than the likely priorities in LEDCs.

Question 7

- (a) This was well answered, with over 50% of students gaining full marks for referring to the increased amounts of UV reaching the Earth's surface and the likely health consequences.
- (b) This was also well answered, with many good descriptions of the role of CFCs.
- (c) Many students gave good answers related to the Montreal Protocol and the development of alternative materials and processes as CFCs use was phased out.

Question 8

- (a)(i) The role of sedimentation lagoons in reducing the turbidity of drainage water was not well understood.
- (a)(ii)/ (iii)/(iv) The roles of tree planting, baffle mounds and water sprays were better understood, although few could explain why water sprays reduce dust problems.
- (b) This was generally well answered, although a minority thought that litmus paper indicates the pH rather than just whether the solution is acidic or alkaline.

Question 9

- (a) Over 80% of students correctly drew a line indicating a positive correlation.
- (b) This was well answered with about 50% of students gaining all four marks.
- (c) This question produced very variable answers. The specific question set related to the control of soil conditions to help living organisms produce a fertile soil. Better answers showed a clear understanding of how living organisms increase fertility, their requirements for survival and what humans can do to provide these conditions. Weaker answers showed a lack of understanding of what fertility is and how it can be controlled.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results Statistics](#) page of the AQA Website.

Converting Marks into UMS marks

Convert raw marks into Uniform Mark Scale (UMS) marks by using the link below.

[UMS conversion calculator](#)