



**General Certificate of Education (A-level)
June 2011**

Environmental Studies

ENVS2

(Specification 2440)

Unit 2: The Physical Environment

Report on the Examination

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General

The vast majority of candidates attempted all question sections.

Question 1

Most candidates gained three marks and 25% gained full marks. Coal, slate and gravel were the best known answers.

Question 2

- (a) While many candidates could define a dynamic equilibrium, very few could refer to processes that relate directly to aquifers, many using processes such as rainfall or evaporation as examples.
- (b) Many candidates gave sandstone, chalk or limestone as correct examples. The most common wrong answer was granite.
- (c) This was poorly answered. The question referred to the aquifer rock not the rocks above or below the aquifer. Porosity and permeability are poorly understood concepts. Many candidates said the aquifer should have low permeability to prevent the water from leaking or flowing away.
- (d) Some candidates ignored the reference to salinisation. Those that did not usually gained both marks with reference to lowered water table/pressure followed by a saltwater incursion.

Question 3

- (a) Questions on the nitrogen cycle in the past have often been poorly answered. It was pleasing that most candidates gave at least one specific example of a role of bacteria in the nitrogen cycle.
- (b) This was surprisingly poorly answered, since simple answers such as 'making proteins' would have gained a mark. Overly simplistic answers such as 'growth' were often given.
- (c) This was one of the most poorly answered questions. The plans of all scientific investigations should involve the same basic questions, such as: Where? How? How big? How many? When? Some candidates gave answers that included several possibilities such as mixing systematic, stratified and random sampling.
- (d) Some candidates had some knowledge of this issue, but failed to gain marks by giving vague answer related to geological processes being very slow. A minority of candidates gained both marks by referring to the lack of gases containing phosphorus and the low solubility of phosphates.

Question 4

- (a) (i) A minority of candidates gave correct answers such as coal mine ventilation. Many thought methane is a product of fossil fuel combustion.
- (a) (ii) Many candidates understood the role of bacteria but failed to be specific that the processes are anaerobic.
- (b) Many candidates missed the point of the question and gave answers about what could be done, including methods that are unlikely to be feasible, rather than describing methods that have actually been used as stated in the question.

The most common answers were Landfill Tax to reduce waste going to landfill and landfill gas collection and combustion. Experimental methods such as changing livestock diets were also given credit.

- (c) This was generally well answered.

Question 5

- (a) (i) (ii) (iii) Half the candidates gave a correct substance for the lithosphere, fewer for the oceans but only 5% gave a correct substance containing carbon in the biosphere.
- (b) Only 25% of candidates could manipulate the values from the diagram to see the amount of carbon that would have to be removed from the atmosphere to re-establish an equilibrium.
- (c) Better prepared candidates gave a well-structured sequence of procedures and gained high marks. Poorer answers missed out vital stages such as soil drying or gave impossible temperatures or time periods.

Question 6

- (a) Many candidates knew the importance of storing the soil in a sealed container.
- (b) Only a minority of candidates understood that the water content can only be estimated when the soil has been dried to constant mass and that the second of two consecutive identical masses (weight 5) is the first time this is established.
- (c) This was poorly answered with many being unable to read values from the graph and a large number not being able to perform a simple subtraction.
- (d) (i) (ii) About 50% of candidates gave suitable temperatures within the acceptable ranges.
- (e) This was poorly answered with most candidates gaining 1 or 0 marks. The best answers referred to how water may aid the addition of DOM through helping to support vegetation, but also how water can affect the process of decomposition.

Question 7

- (a) The most common error was to misunderstand the meaning of reservoir in a biogeochemical cycle, which greatly reduced the options for giving correct answers.
- (b) This was pleasingly well answered, with many candidates giving answers including correct details of changes in density and buoyancy.
- (c) Many candidates gave rather vague answers. Few could name specific soil processes involving water or show an understanding that a high water content produces anaerobic conditions that limit the aerobic processes that increase fertility. The concept of fertility did not seem to be fully understood.
- (d) This was generally well answered, except for the sizeable minority that confused texture and structure.

Question 8

- (a) (i) (ii) The term reserves was better understood than resource. Few understood that the resource is the theoretical maximum amount that could be exploited using all the technology that may be developed in the future at any market price, while the reserves are that proportion of the resource that can be exploited economically at current market prices with existing technology.
- (b) The majority of candidates understood that a rise in market price reduces the cut-off ore grade.
- (c) This was very poorly answered by most candidates. Some gave answers related to better exploration techniques, which did not specifically relate to low-grade ores unless details of improved sensitivity were given. The best answers gave specific examples such as the electrolysis of copper leachate from spoil heaps.
- (d) Most candidates gained 1 or 2 marks but failed to gain full marks by giving imprecise answers. Electronic meters must be calibrated for the readings to be reliable. Many candidates suggested the use of an indicator, which is too vague. Many also described the use of litmus indicator which only gives an acid/alkaline colour, not a particular range.

Question 9

- (a) A large number of candidates understood that using pale surfaces could increase the albedo/reflection, but could not explain accurately how that would affect temperatures.
- (b) This was well answered, with most candidates understanding that increasing infiltration would reduce flooding risks. Only a minority suggested the changes in surface material that could achieve this.
- (c) The extended prose question was well answered which was pleasing. Over 50% of candidates gained 7 marks or more. There were many detailed accounts of how named currents or wind systems may be affected by an initial increase in temperature. El Niño and the North Atlantic Conveyor were the most frequently used examples. Fewer used specific examples of changes in wind patterns.

The most common error was to give a more general answer including ecological impacts.

Mark Ranges and Award of Grades

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