



National  
Qualifications  
RESOURCE

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**X826/75/01**

**Environmental Science  
Section 2 Only**

## **Marking Instructions**

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Please note that these marking instructions have not been standardised based on candidate responses. You may therefore need to agree within your centre how to consistently mark an item if a candidate response is not covered by the marking instructions.

## General marking principles for National 5 Environmental Science

*This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this paper. These principles must be read in conjunction with the detailed marking instructions, which identify the key features required in candidate responses.*

- (a) Marks for each candidate response must **always** be assigned in line with these general marking principles and the detailed marking instructions for this assessment.
- (b) Marking should always be positive. This means that, for each candidate response, marks are accumulated for the demonstration of relevant skills, knowledge and understanding; they are not deducted from a maximum on the basis of errors or omissions.
- (c) If a specific candidate response does not seem to be covered by either the principles or detailed marking instructions, and you are uncertain how to assess it, you must seek guidance from your team leader.
- (d) There are no half marks awarded.
- (e) Where a candidate makes an error at an early stage in a multi-stage calculation, credit should normally be given for correct follow-on working in subsequent stages, unless the error significantly reduces the complexity of the remaining stages. The same principle should be applied in questions which require several stages of non-mathematical reasoning.
- (f) Unless a numerical question specifically requires evidence of working to be shown, full marks should be awarded for a correct final answer (including unit) on its own.
- (g) Where a wrong answer (for which no credit has been given) is carried forward to another step, credit will be given provided the end result is used correctly.

## Marking instructions for each question

### Section 2

| Question |     |  | Expected answer(s)                                                                                                                                                                                                                                                                                                                                                                                               | Max mark | Additional guidance |
|----------|-----|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------------------|
| 1.       | (a) |  | The average yearly temperature has increased from 1884 to 2019.<br><br>Or other valid response.                                                                                                                                                                                                                                                                                                                  | 1        |                     |
|          | (b) |  | Storm events could result in seawater contaminating groundwater.<br><br>Increased frequency/intensity of storms could stir up sediments in water.<br><br>Higher water temperature will reduce the oxygen content of the water.<br><br>Or other valid response.                                                                                                                                                   | 1        | Any one             |
| 2.       | (a) |  | Detritivore                                                                                                                                                                                                                                                                                                                                                                                                      | 1        |                     |
|          | (b) |  | Juveniles are parasitic/feed on fish blood and body fluids.                                                                                                                                                                                                                                                                                                                                                      | 1        |                     |
|          | (c) |  | <p>Temperature change (1 mark)<br/>could interfere with stages of the lamprey's life cycle. (1 mark)</p> <p>OR</p> <p>Warmer waters will hold less dissolved oxygen (1 mark)<br/>and affect the lamprey's ability to breathe. (1 mark)</p> <p>OR</p> <p>Lower dissolved oxygen (1 mark)<br/>could affect host fish species' survival so impact lamprey's food source. (1 mark)</p> <p>Or other valid answer.</p> | 2        |                     |

| Question |     |       | Expected answer(s)                                                                                                                                                                                                                            | Max mark | Additional guidance                                                                                                                                                                   |
|----------|-----|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3.       | (a) | (i)   | 106 (ha)                                                                                                                                                                                                                                      | 1        | No mark awarded if not rounded.                                                                                                                                                       |
|          |     | (ii)  | Adding x-axis labels and y-axis scale<br>(1 mark)<br><br>Accurate plotting<br>(1 mark)                                                                                                                                                        | 2        | x-axis labels should include 'tree species' plus individual bar labels.                                                                                                               |
|          |     | (iii) | Scottish Natural Heritage/SNH                                                                                                                                                                                                                 | 1        | Accept NatureScot (new name for SNH)                                                                                                                                                  |
|          |     | (iv)  | The shingle complex must be protected under the SSSI management requirements.<br><br>OR<br><br>To maintain the extent of open shingle.<br><br>OR<br><br>To slow the rate of gorse spreading onto the shingle.<br><br>Or other valid response. | 1        | Gorse removal aims to maintain the character of the shingle complex.                                                                                                                  |
|          | (b) | (i)   | (Angular) pieces of rock break off <i>in situ</i> rocks through <u>weathering</u> .<br>(1 mark)<br><br>Collision with other rocks (during transportation) breaks off (angular) pieces through <u>erosion</u> .<br>(1 mark)                    | 2        | Response must refer to weathering and erosion processes.                                                                                                                              |
|          |     | (ii)  | The large (pore) spaces between the stones means that (most water will pass through but) there will be a large surface area on the stones for water to attach to.                                                                             | 1        |                                                                                                                                                                                       |
| 4.       |     |       | £6.57 million                                                                                                                                                                                                                                 | 2        | Dearest option = rock armour<br>£1 in 1996 = £1.96 in 2020<br><br>£6.84 million × 1.96 = £13.41 million (rounded) (1 mark)<br>£13.41 million - £6.84 million = £6.57 million (1 mark) |

| Question |  |  | Expected answer(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Max mark | Additional guidance                                                                                                                                                                                                                                                                                                                                                                    |
|----------|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5.       |  |  | <p><b>Yes</b></p> <p>The aim of the engineering is to strengthen shingle defences, which would provide added protection to Settlement X.<br/>(1 mark)</p> <p>People/communities/buildings will be at risk from flooding as a result of sustained breaching of the shingle bank.<br/>(1 mark)</p> <p>Flooding/loss of Settlement X would have <b>named</b> social/economic impact on the area eg<br/>loss of accommodation/food outlets/toilets, may deter tourists/wildlife enthusiasts<br/>(1 mark)</p> <p>and reduce tourism revenue to the area.<br/>(1 mark)</p> <p>Strengthening the shingle complex will ensure continued habitat provision for species living on it.<br/>(1 mark)</p> <p>The shingle complex supports specialised species, which may be at risk if the shingle banks continue to be eroded by storm events.<br/>(1 mark)</p> <p>Marine species will be at risk of habitat loss due to construction of a breakwater.<br/>(1 mark)</p> <p>Revenue from tourism may decrease if the shingle complex degrades further/ species are lost/the SSSI status is removed.<br/>(1 mark)</p> <p>Or other valid response.</p> | 4        | <p>1 mark for each valid <u>expanded</u> point that relates to the selected option.</p> <p>Candidates may cite statements from the evidence provided, but these must then be discussed further. No marks for stating information provided.</p> <p>Discussion may offer counter-arguments for the other option but should conclude with why the nominated option should be adopted.</p> |

| Question |  |  | Expected answer(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Max mark | Additional guidance |
|----------|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------------------|
| 5.       |  |  | <p><b>No</b></p> <p>The shingle complex is constantly shaped by river/coastal processes, so engineering might interfere with these/prove ineffective. (1 mark)</p> <p>The shingle complex has formed through natural processes and is designated a SSSI because of these, so should be allowed to continue without intervention. (1 mark)</p> <p>Engineering is expensive and intensity/frequency of storm events/precipitation is uncertain (in the longer term), so better/cheaper to deal with impacts as they arise. (1 mark)</p> <p>Breakwater/rock groyne construction requires below-ground engineering, so will disturb seabed/species and threaten SSSI status. (1 mark)</p> <p>Breakwater may obstruct sea lamprey/salmon migration, reducing their spawning potential/survival. (1 mark)</p> <p>Rock armour/groyne has a visual impact that could deter visiting wildlife enthusiasts/tourists, which brings in revenue to the local area. (1 mark)</p> <p>Rock groynes may reduce the problem locally but enhance it along the coast. (1 mark)</p> <p>Transportation of construction materials to the site will cause noise/dust/disturbance to locals. (1 mark)</p> <p>Transportation of construction materials will emit greenhouse gases, which will enhance global warming/climate change. (1 mark)</p> <p>Or other valid response.</p> |          |                     |

[END OF MARKING INSTRUCTIONS]

The following table provides information on each question including: Course content being assessed; Skills assessed (see Environmental Science Understanding Standards materials for a definition of each code); Maximum mark; A-type marks.

| Question |          | Course content - Topic & key area                     | Skills assessed | Maximum mark | A-type marks |
|----------|----------|-------------------------------------------------------|-----------------|--------------|--------------|
| 1        | (a)      | Sustainability - skill                                | S6              | 1            | 1            |
|          | (b)      | Sustainability - Water                                | K3              | 1            |              |
| 2        | (a)      | Living Environment - Interdependence                  | K1              | 1            |              |
|          | (b)      | Living Environment - Interdependence                  | K2              | 1            |              |
|          | (c)      | Sustainability - Energy                               | S5              | 2            | 1            |
| 3        | (a)(i)   | Earth's Resources - skill                             | S4              | 1            |              |
|          | (a)(ii)  | Earth's Resources - skill                             | S3              | 2            |              |
|          | (a)(iii) | Living Environment - Human influences on biodiversity | K1              | 1            |              |
|          | (a)(iv)  | Living Environment - Human influences on biodiversity | K3              | 1            | 1            |
|          | (b)(i)   | Earth's Resources - Geosphere                         | K2              | 2            | 1            |
|          | (b)(ii)  | Earth's Resources - Geosphere                         | K1              | 1            |              |
| 4        |          | Sustainability - skill                                | S4              | 2            |              |
| 5        |          | Living Environment, Earth's Resources, Sustainability | S6              | 4            | 2            |

This section has not been used as a live examination and the questions are therefore untested. Questions labelled with A-type marks are those predicted to perform as A-grade. The marking instructions have not been standardised based on candidate responses and you may therefore need to agree within your centre how to consistently mark an item if a candidate response is not covered by the marking instructions.

The examination is normally balanced across the whole of the paper.