

GENERAL CERTIFICATE OF SECONDARY EDUCATION
ENVIRONMENTAL AND LAND-BASED SCIENCE
Management of the Natural Environment (Higher Tier)

B493/02

Candidates answer on the Question Paper

OCR Supplied Materials:

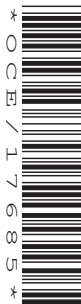
None

Other Materials Required:

- Electronic calculator
- Pencil
- Ruler (cm/mm)

Wednesday 26 May 2010
Morning

Duration: 45 minutes



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your Candidate Number, Centre Number and question number(s).

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **36**.
- This document consists of **20** pages. Any blank pages are indicated.

Answer **all** the questions.

- 1 The photograph shows students setting off to do fieldwork.



A **risk assessment** is always needed before students do any fieldwork in school. The risk assessment states that:

‘fieldwork should be carried out in groups of two or three pupils’.

Why is this instruction included?

- A pupils can exchange information
- B there is less habitat disturbance
- C there is safety in numbers
- D the work can be done more quickly

Answer **A, B, C** or **D** [1]

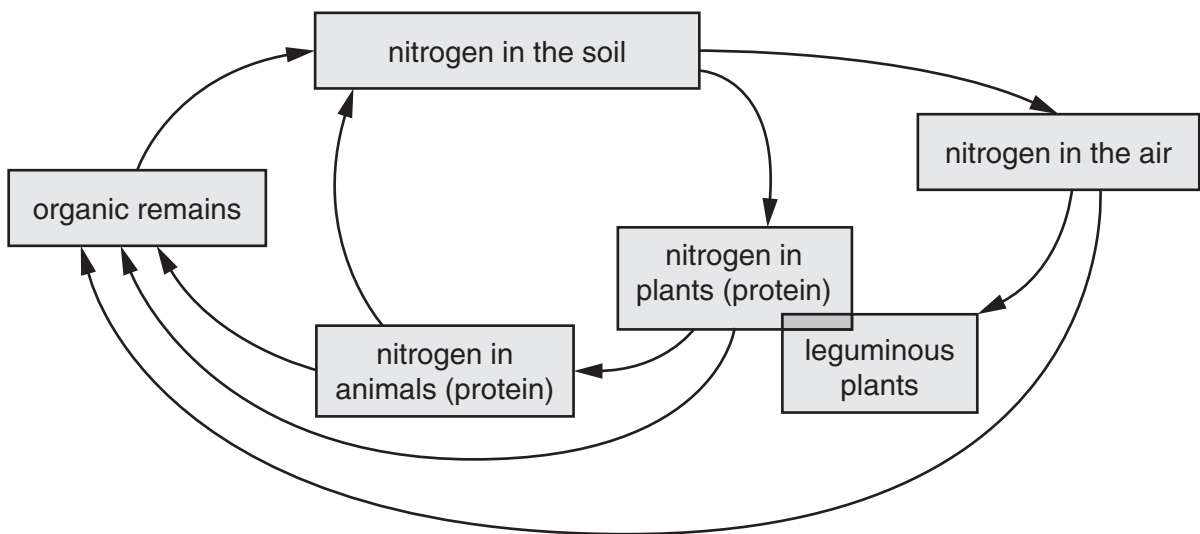
2 Food can be produced from GM (genetically modified) crops.

Why might growing these crops cause long term harm to the environment?

- A GM pollen might affect the air quality.
- B GM crops might invade the hedgerows.
- C GM crops might cause visual pollution.
- D GM crops might breed with wild species.

Answer **A, B, C** or **D** [1]

3 The diagram shows part of the nitrogen cycle.



Place **D** on the part of the diagram that represents the process of **decay**.

Place **F** on the part of the diagram that represents the process of **nitrogen fixation**.

Make sure the **D** and the **F** are clearly visible.

[2]

4 Coastlines are always changing.

The photographs show two coastal landmarks in Sussex.

The possible **causes of change** and the **processes involved** are listed below.

cause of change	process involved
chemical action	deposition
tidal action	erosion
wave action	precipitation
wind action	suspension

Write the correct **cause of change** and the correct **process involved** below each photograph.

Choose from the lists above.

**shingle spit,
Chichester**



cause of change

process involved

**chalk cliffs,
Beachy Head**



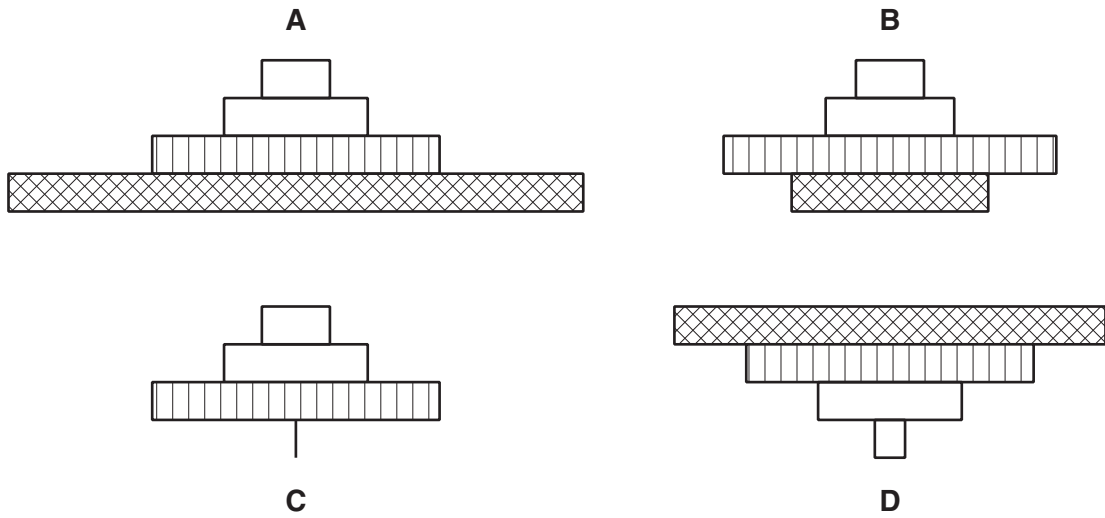
cause of change

process involved

[2]

5 Below are four ecological pyramids.

One represents a **pyramid of numbers** for oceans, lakes and grassland.



Which diagram represents the pyramid of numbers for oceans, lakes and grassland?

Answer **A, B, C** or **D** [1]

6 The photograph shows a UK ecosystem.



Which ecosystem is illustrated by the photograph?

- A coniferous woodland
- B deciduous woodland
- C ley grassland
- D lowland heathland
- E moorland

Answer **A, B, C, D or E** [1]

7 Nitrate fertiliser can leach into rivers causing **eutrophication**.

The stages in eutrophication are

- algae are encouraged to grow (green slime)
- when the algae die microbes break them down
- this uses up oxygen
- fish and other organisms that need oxygen then die.

River authorities test water quality so eutrophication can be controlled.

Nitrate-testing requires taking water samples and carrying out tests in labs.

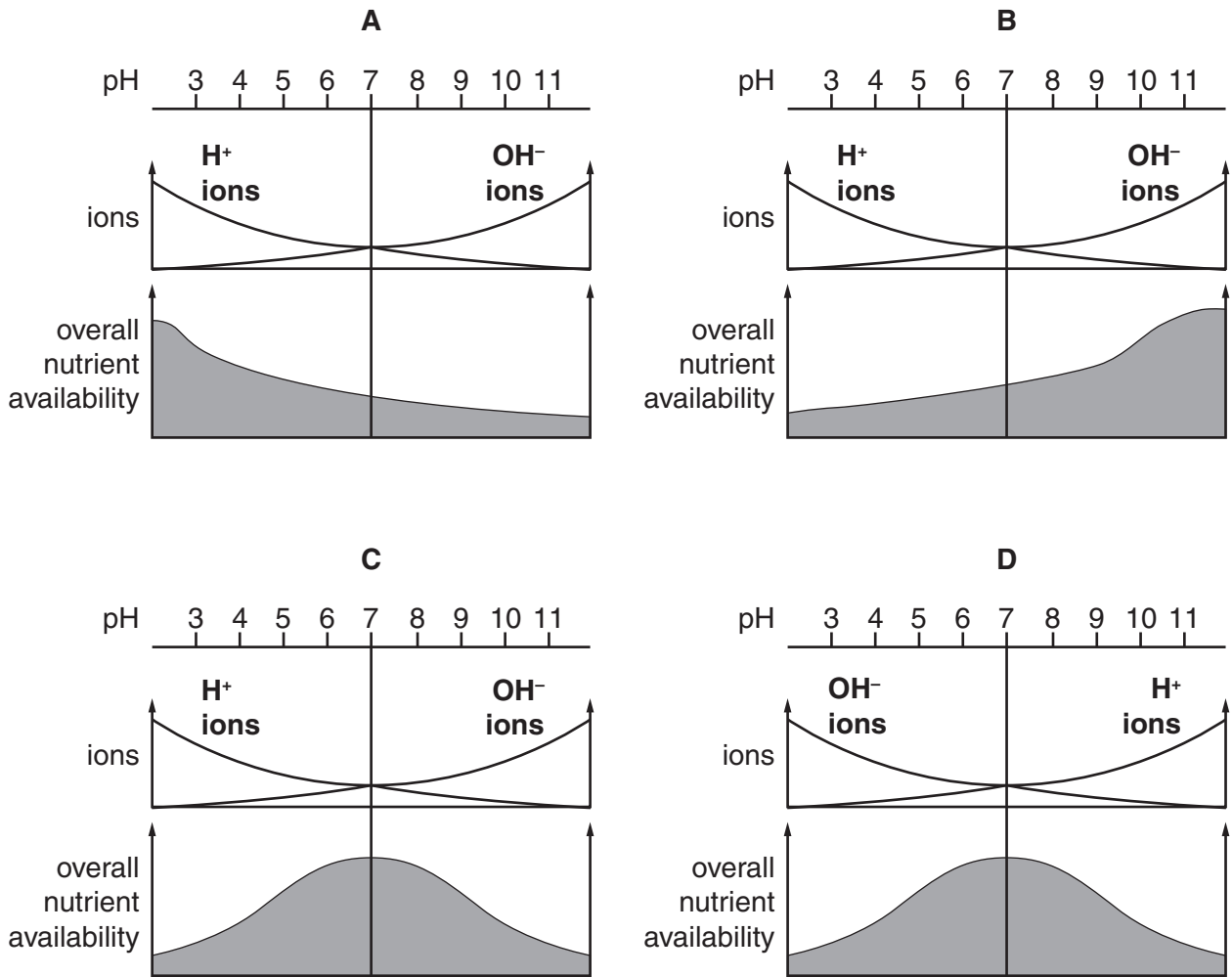
ICT, using probes, can give immediate indications of river conditions.

Which probe should be used to give **early signs** of eutrophication?

- A water clarity probe
- B oxygen probe
- C pH probe
- D temperature probe

Answer **A, B, C** or **D** [1]

8 The diagrams show the relationship between pH, the concentration of two ions and the overall nutrient availability.



Which of the diagrams shows the correct relationship between pH, ions and the availability of nutrients to plants?

Answer **A, B, C** or **D** [1]

9 The photograph shows a garden slug.



Slugs are a garden pest.

They can be controlled by putting down a poisonous bait.

(a) Suggest an environmental risk of controlling slugs by poisonous bait.

.....
..... [1]

(b) Suggest how the gardener can reduce this risk when using poisonous bait.

.....
..... [1]

10 The picture shows an advert for 'Slug Gone'.



It is a natural method for the control of slugs and weeds.
Pellets made of wool fibre are put on the ground around plants.
The pellets absorb water and form a 'carpet' layer on the soil surface.
The wool fibres irritate the slug's 'foot' so the slug does not go near the plant.

(a) Explain why 'Slug Gone' can be called 'organic'.

.....
..... [1]

(b) Explain how 'Slug Gone' controls weeds around the plant.

.....
..... [1]

11 The photographs show a gorse bush and a close up of some of its branches.



Gorse grows on heaths, moorland and on exposed cliff tops.

State **one** adaptation it shows to living in **exposed** places and explain how this is beneficial.

adaptation to exposed place

.....

benefit to plant

..... [2]

12 The photograph shows a parakeet.

Parakeets

- were brought to England from India
- have escaped from captivity
- are very common in southern England
- live in parks and woods
- live on a diet of fruit, berries, nuts and seeds



Explain **two** ways the parakeets could upset the present balance of species in parks and woods.

.....

.....

..... [2]

13 The picture shows the type of tyre recommended for use on heavy machinery to avoid compaction of the soil.



The tyre is wide and has shallow treads.

What other feature of this tyre helps to reduce compaction?

..... [1]

14 Soil can be classified by mineral particle size.

A key can be used to identify soils by mineral particle size.

For example:

1	mineral particle less than 0.002 mm	clay
	mineral particle more than 0.002 mm	go to 2
2	mineral particle over 2.0 mm	gravel
	mineral particle between 2.0 mm and 0.002 mm	sand

Different percentages of mineral particles give soils different textures. These textures can be recognised by touch, feel and sight.

Farmers sometimes need to identify soil types without using any equipment.

Construct a simple key, similar to the one above, which could be used to identify soil samples from their **texture** as clay, gravel, or sand.

[3]

- 15 The Countryside Stewardship Scheme requires that farm hedges are cut only from October to March.

The table compares **farm types** and when their **hedges are cut**.

farm type	percentage of hedges cut			
	Jan–March	April–June	July–Sept	Oct–Dec
cereals	37	0	20	43
other crops	39	1	19	41
pigs & poultry	33	3	13	51
dairy	26	0	23	51
sheep	30	1	13	56
mixed	36	0	15	49

Choose from the list below to answer the following questions.

- cereals**
other crops
pigs & poultry
dairy
sheep
mixed

- (a) Which farm type has the highest record of cutting hedges **outside** the required period?

..... [1]

- (b) The Countryside Stewardship Scheme recommends that farm hedges be cut every 2 or 3 years.

The table compares **farm types** and the **frequency of hedge cutting**.

farm type	percentage of hedges cut			
	twice a year	once a year	once every 2 or 3 years	never
cereals	2	26	60	12
other crops	1	26	52	12
pigs & poultry	0	37	46	17
dairy	0	46	44	10
sheep	1	41	35	23
mixed	1	41	47	11

Which **two** farm types have a higher percentage of hedges cut once a year than the recommended once every 2 or 3 years?

..... and [1]

16 The table compares **farm size** and **when their hedges are cut**.

farm size	number of farms in sample	percentage of hedges cut			
		Jan–March	April–June	July–Sept	Oct–Dec
large	496	32	0	20	48
medium	235	27	1	17	55
small	607	35	1	16	48
all farms	1338	33	1	17	49

(a) Which farm size has the highest **number** of farms that cut hedges in the Oct–Dec period?

Show how you get your answer.

..... [1]

(b) The table compares **farm size** and the **frequency of hedge cutting**.

farm size	number of farms in sample	percentage of hedges cut			
		twice a year	only once a year	once every 2 or 3 years	never
large	501	1	35	55	9
medium	240	0	40	49	11
small	625	2	37	44	18
all farms	1366	1	37	49	?

What percentage of **all farms** never cut their hedges?
Show your working.

..... [1]

- 17 Animals are adapted to the ecosystems in which they live. If their ecosystem changes they do not survive well.

Look at this table.

mammal	population in 2010	percentage decline in UK between 1985 and 2010	main reason for decline	
			habitat loss	competition with similar species
harvest mouse	1.4 million	71	✓	
hazel dormouse	45 000	3	✓	
hedgehog	1.3 million	21	✓	
mountain hare	442 000	13		✓
red squirrel	121 000	64		✓
water vole	875 000	88		✓

- (a) Using the data in the table suggest which mammal is most at risk during the **next** 25 years.

Explain your answer.

.....
 [1]

- (b) Which of these mammals was the most common 25 years ago?

Show how you get your answer.

..... [1]

18 The photographs show two ways of cultivating sunflowers.



monoculture cultivation



mixed cultivation

Define 'monoculture' and describe **two** effects it has had on the landscape.

definition

.....

effect 1

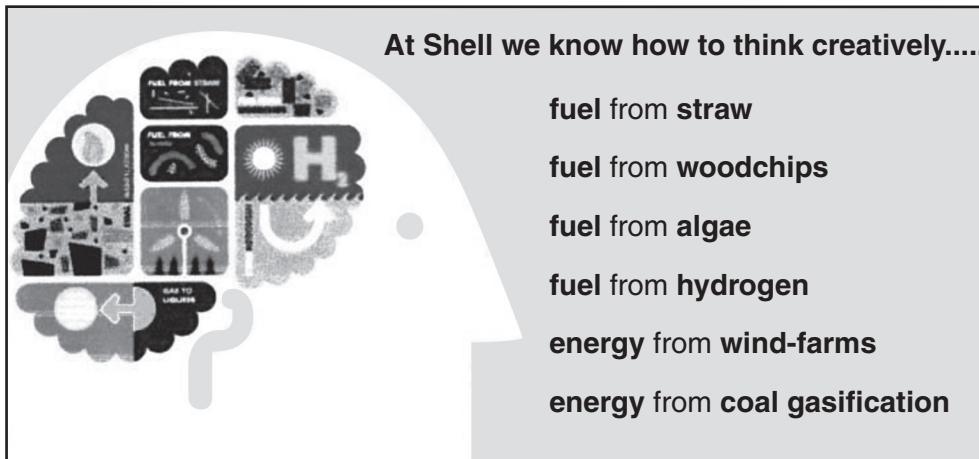
.....

effect 2

.....

[3]

19 This is an advert for tackling climate change while providing fuel for a growing population.



At Shell we know how to think creatively.....

- fuel from straw**
- fuel from woodchips**
- fuel from algae**
- fuel from hydrogen**
- energy from wind-farms**
- energy from coal gasification**

Select **one** of the ideas from the list and state **two** reasons why it might help solve the problem.

idea

1

.....

2

..... [2]

20 The picture shows a beaver, which is a medium sized mammal living in streams.



Beavers used to live wild in the UK.

They

- provided skin for fur coats.
- were classed as fish so could be eaten on Fridays.
- were hunted to extinction in the 1500's.
- are herbivores, eating mainly leaves and bark from trees that they cut down with their large teeth.

Defra plan to allow the introduction of beavers into several sites in the UK.

Should they be reintroduced? Argue the case for **or** against.

.....

.....

.....

.....

.....

.....

.....

.....

[3]

END OF QUESTION PAPER

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