Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
TOTAL	

AQA

General Certificate of Education
Advanced Subsidiary Examination
June 2015

Environmental Studies ENVS1

Unit 1 The Living Environment

Wednesday 13 May 2015 1.30 pm to 2.30 pm

You will need no other materials.
You may use a calculator.

Time allowed
- 1 hour

Instructions
- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60.
  Two of these marks are for the Quality of Written Communication.
- You will be marked on your ability to:
  – use good English
  – organise information clearly
  – use specialist vocabulary where appropriate.
- Question 5(c) should be answered in continuous prose.
  Quality of Written Communication will be assessed in this answer.

A

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Answer **all** questions in the spaces provided.

1 **Table 1** includes details of a range of ecological investigation methods or equipment.

Complete **Table 1**.

[5 marks]

Table 1

Method / equipment	**Purpose**
	Collecting of invertebrates from vegetation overhead
Tüllgren funnel	
Lincoln Index	
Kick sampling	Collecting of river bed invertebrates
	A line or belt used to locate sampling sites along an environmental gradient
	To produce a defined sampling area, usually square

5

Turn over for the next question

2 (a) Management of woodland by coppicing may be carried out to increase its wildlife value.

Describe the practice of woodland coppicing.

[2 marks]

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2 (b) **Table 2** shows data used to calculate the species diversity (**D**) of moths found in two different areas of woodland.

Table 2

Moth species	Number of individuals	
	Coppiced woodland	**Uncoppiced woodland**
A	25	0
B	8	2
C	12	8
D	6	3
E	9	0
F	11	5
Total	71	18
Species diversity (**D**)	4.97	

Use the data in **Table 2** to calculate the species diversity (**D**) of the **uncoppiced woodland area**.
Show your working.

[2 marks]

$$\mathbf{D} = \frac{N\,(N-1)}{\Sigma\, n\,(n-1)}$$

N = total number of organisms of all species
n = number of organisms of a particular species
Σ = sum of

D = ...

2 (c) Outline how the data for the moth populations may have been collected to ensure that the results were representative.

[6 marks]

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Turn over for the next question

3 (a) Outline why the conservation of rainforests is important for:

3 (a) (i) increasing global food supplies

[2 marks]

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3 (a) (ii) maintaining the local climate

[2 marks]

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3 (a) (iii) maintaining the global climate

[2 marks]

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3 (a) (iv) reducing coastal sedimentation.

[2 marks]

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3 (b) Tropical rainforests are the most biodiverse terrestrial ecosystems.

Explain how abiotic factors have allowed the development of such high biodiversity.

[2 marks]

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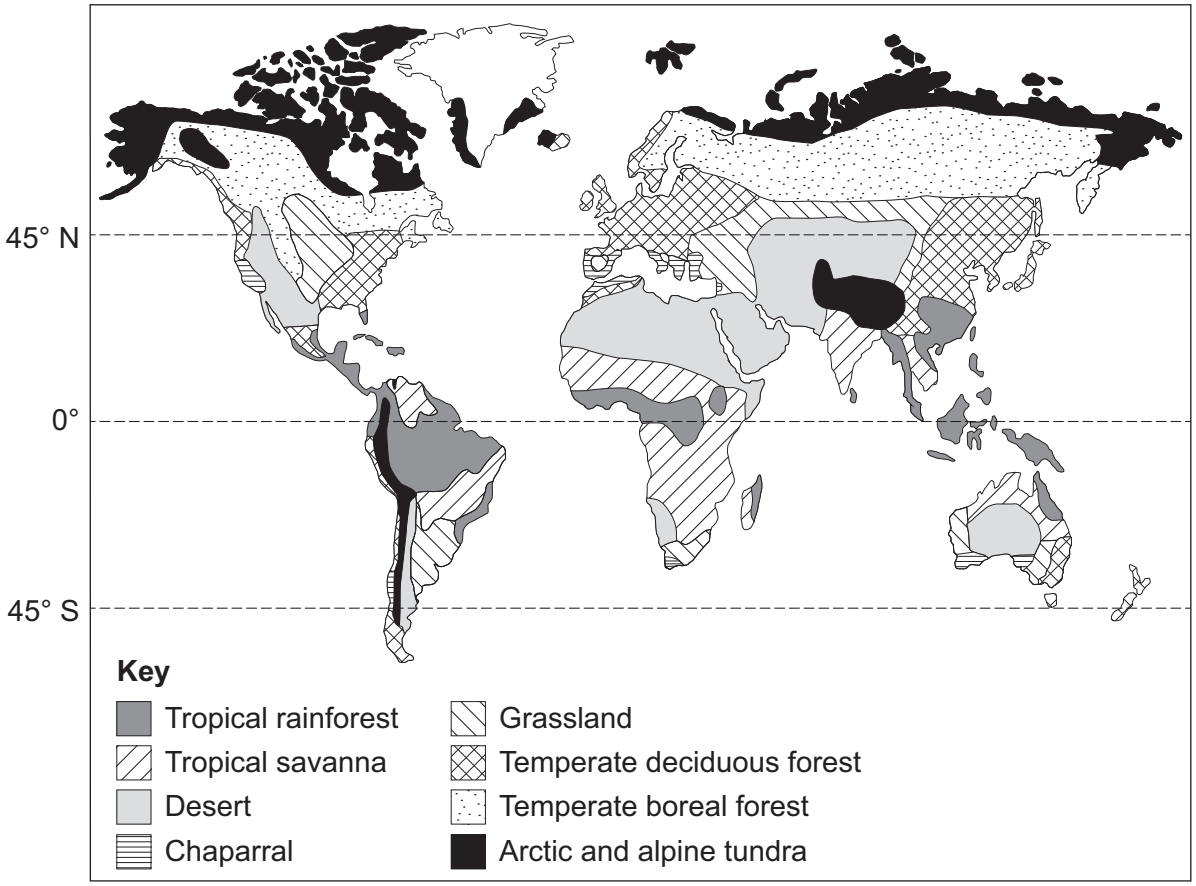
Turn over for the next question

4 **Figure 1** shows the global distribution of major biomes.

Figure 1



Some ecosystems are given the same names as biomes but there are differences between them.

4 (a) How does the meaning of **ecosystem** differ from the meaning of **biome**?

[2 marks]

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4 (b) New species colonising an area may affect the community of species already there.

4 (b) (i) Outline **two** ways in which colonisation by new species may benefit those species already present.

[2 marks]

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2 .....

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4 (b) (ii) Outline **two** ways in which colonisation by new species may be a threat to those species already present.

[2 marks]

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2 .....

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Question 4 continues on the next page

4 (c) Two areas of rainforest were studied that orginally had the same plant communities.

The aim of the study was to assess the impact of the introduction of a non-indigenous herbivorous insect to one of the areas.

Suggest the data that may have been collected to assess the impact of the introduction of the insect on the plant community in the rainforest.

[4 marks]

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5 (a) Outline the differences between SPAs and Ramsar Sites.

[2 marks]

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5 (b) Which **one** of the following designated areas is involved with landscape conservation rather than wildlife conservation?

[1 mark]

Tick (✓) **one** box.

AONB ☐

MNR ☐

NNR ☐

SAC ☐

SPA ☐

Question 5 continues on the next page

5 (c) Landscape features are produced by natural processes and by human activities.

Explain how maintaining landscape features produced by human activities may benefit wildlife.

You should answer this question in continuous prose.
Quality of Written Communication will be assessed in this answer.

[8 marks]

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5 (d) Outline how the following methods may be used to resolve land-use conflicts.

5 (d) (i) Cost Benefit Analysis

[2 marks]

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5 (d) (ii) Leopold Matrix

[2 marks]

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Turn over for the next question

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6 (a) A keystone species is one whose survival is particularly important for many other species.

The African Forest Elephant is thought by many ecologists to be a distinct species, *Loxodonta cyclotis.* It is a keystone species in some forests of West Africa.

Suggest **three** ways in which other forest species may be affected if the local elephant population died out.

[3 marks]

1 .....

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2 .....

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Question 6 continues on the next page

6 (b) **Figure 2** and **Figure 3** give information about the populations of African Forest Elephants in three African countries.

Figure 2

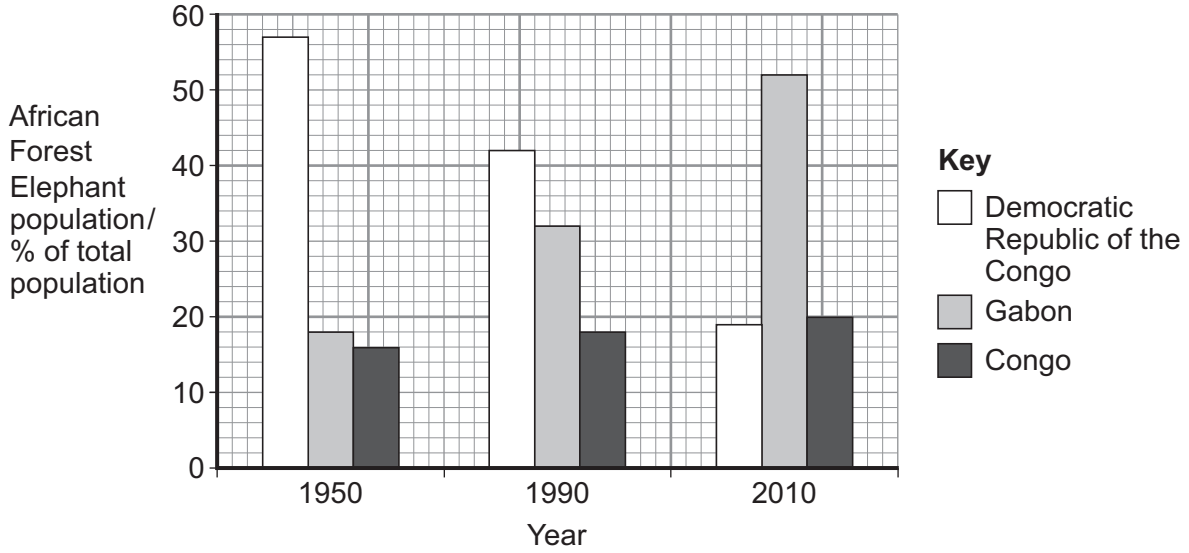
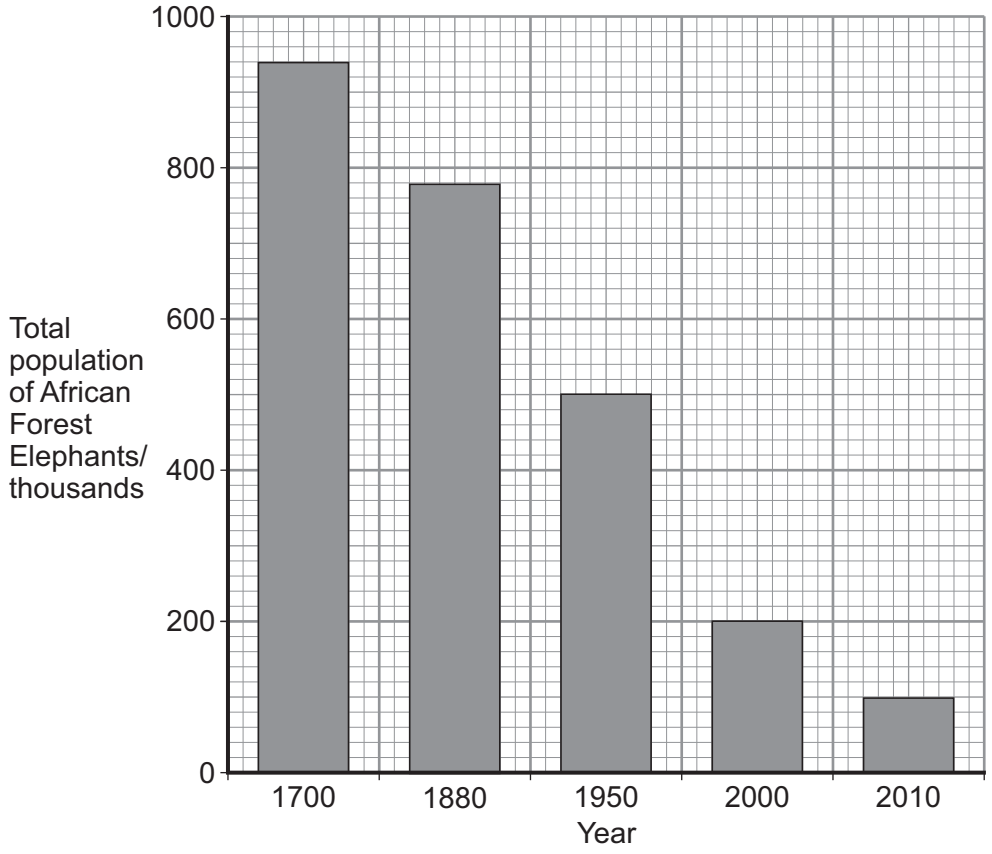


Figure 3



Calculate the change in the number of African Forest Elephants found in Gabon between 1950 and 2010.
Show your working.

[2 marks]

Change in population = ... elephants

6 (c) How does CITES help the conservation of elephants?

[1 mark]

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Question 6 continues on the next page

6 (d) Another African species of concern is Grevy's Zebra.

Table 3 gives information about the African Forest Elephant and Grevy's Zebra.

Table 3

Feature	**African Forest Elephant**	**Grevy's Zebra**
IUCN conservation status	Vulnerable	Endangered
Adult weight	3000 kg	400 kg
Lifetime	70 yrs	20 yrs
Population in captivity	41	600
Age at sexual maturity (females)	10 yrs	3 yrs
Length of pregnancy	22 months	13 months
Frequency of giving birth	4 – 9 years	1 – 2 years

Use the information in **Table 3** and your own knowledge to explain why a captive breeding programme is less likely to be successful for African Forest Elephants than for Grevy's Zebra.

[2 marks]

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6 (e) Describe **one** method that may be used to increase the success of breeding endangered species in captivity.

[2 marks]

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END OF QUESTIONS

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