

Environmental systems and societies
Standard level
Paper 2

Friday 20 May 2016 (afternoon)

Candidate session number

2 hours

--	--	--	--	--	--	--	--	--	--

Instructions to candidates

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Section A: answer all questions. Refer to the resource booklet which accompanies this question paper.
- Section B: answer two questions.
- Write your answers in the boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is **[65 marks]**.



Section A

Answer **all** questions. Write your answers in the boxes provided.

The resource booklet provides information on Zambia. Use the resource booklet and your own studies to answer the following.

1. (a) (i) Estimate the number of people in the 15 to 19 age group in the population pyramid in **Figure 3**. [1]

.....
.....

- (ii) Outline why the shape of the population pyramid in **Figure 3** indicates a high future population growth for Zambia. [2]

.....
.....
.....
.....

- (b) (i) Describe **two** different impacts on the ecosystem from mining activity in the Copperbelt Province. [2]

.....
.....
.....
.....

- (ii) Describe **one** impact on human health from mining activity in the Copperbelt Province. [1]

.....
.....

(This question continues on the following page)



(Question 1 continued)

- (c) (i) With reference to **Figure 6**, identify **two** changes in land use that have taken place in the Copperbelt Province between 1972 and 2000. [2]

.....

.....

.....

.....

- (ii) Suggest possible reasons for the changes you have identified in (c)(i). [3]

.....

.....

.....

.....

.....

.....

- (iii) Identify **four** factors that would affect the primary productivity of forest plantations in the Copperbelt Province. [2]

.....

.....

.....

.....

- (d) (i) With reference to **Figure 7**, state the most common ecosystem in Zambia. [1]

.....

.....

(This question continues on the following page)



16EP03

Turn over

(Question 1 continued)

- (ii) **Figure 7** lists biomes and ecosystems in two different columns. Distinguish between a biome and an ecosystem. [2]

.....

.....

.....

.....

- (e) (i) With reference to **Figure 8(b)**, identify **two** factors that IUCN would have considered in placing Ansell’s Shrew in a different Red List category to the Large-eared free-tailed Bat. [1]

.....

.....

- (ii) With reference to **Figure 8(c)**, explain how the distribution of national parks and game management areas in Zambia helps to provide effective conservation. [3]

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(This question continues on the following page)



16EP04

Section B

Answer **two** questions. Write your answers in the boxes provided.

Each essay is marked out of **[20]** of which **[2]** are for clarity of expression, structure and development of ideas:

- [0]** Quality of expression, structure and development is poor.
- [1]** Quality of expression, structure and development is limited.
- [2]** Quality of expression is clear, structure is good and ideas are well developed.

2. (a) Outline the Gaia hypothesis as a model of the global ecosystem. [4]
- (b) Describe the similarities and differences between the terms *sustainable yield* and *sustainable development*. [6]
- (c) Discuss the relationship between the economic development of countries and the sustainability of their food production. [8]

Expression of ideas [2]

3. (a) Outline the role of limiting factors in S and J population curves. [4]
- (b) Fertility and crude birth rate can both be used as indicators of human population growth.
- Explain the strengths and weaknesses of using each of these as indicators of growth in human populations. [6]

- (c) Development policies may address a range of different aspects of development that influence human population growth either directly, or through education, healthcare and economic growth.
- Evaluate the direct and indirect influences of such development policies on factors affecting human population curves. [8]

Expression of ideas [2]



4. (a) Outline **four** ways in which the differences between sand and clay soils may affect primary productivity. [4]

(b) A non-governmental organization has been contracted to investigate the impacts of a landfill site on the surrounding terrestrial ecosystem.
Suggest how the investigation should be designed to ensure reliability and validity. [6]

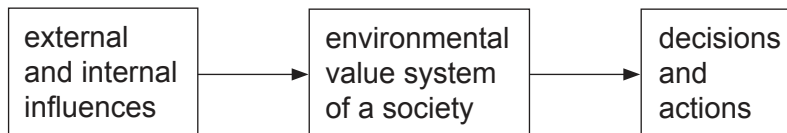
(c) The impacts of acid rain on terrestrial ecosystems may include acidified soils, leaching of nutrients, release of toxins and damage to vegetation. The impacts of global warming on these systems may include desertification, flooding, loss of species and shifting of biomes.
For terrestrial ecosystems, discuss the difficulty of managing the impacts of acid rain compared to that of managing the impacts of global warming. [8]

Expression of ideas [2]

5. (a) Outline how global rates of extinction have changed over time. [4]

(b) Ecocentrics recognise that all species have an intrinsic value.
Explain the strengths and weaknesses of using intrinsic value when making decisions about development and conservation. [6]

(c) Environmental value systems may be seen as having both inputs and outputs as shown in the diagram below:



As a society develops over time from an original pioneer population, various influences may have caused changes in their common value systems and decisions.

With reference to energy sources in a developed country (MEDC), discuss how historical changes in internal and external factors have influenced their environmental value systems and decisions on energy supply. [8]

Expression of ideas [2]



A large rectangular area containing 25 horizontal dotted lines, intended for writing or drawing.



16EP08

A large rectangular area containing horizontal dotted lines for writing.



16EP09

Turn over

A large rectangular area containing horizontal dotted lines, serving as a template for writing or drawing.



16EP10

A large rectangular area containing horizontal dotted lines for writing.



16EP11

Turn over

A large rectangular area containing horizontal dotted lines for writing.



16EP13

Turn over

A large rectangular area containing 25 horizontal dotted lines, intended for writing or drawing.



16EP14

A large rectangular area containing horizontal dotted lines for writing.



16EP15

Turn over

A large rectangular area containing 25 horizontal dotted lines, intended for writing or drawing.



16EP16