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LIFE SCIENCES PII

Time: 2hrs

100 marks

Examiner: Mrs C van de Venter

Moderator: Mrs T Taylor

Name:	Teacher:
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PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 18 pages and a Source Material Booklet of 17 pages (i–xvii). Please check that your question paper is complete.
 2. The question paper consists of three questions. Question 1 and Question 2 are case studies and Question 3 is an essay. Read the sources provided in the Source Material Booklet and use this information and your own knowledge to answer Questions 1 and 2.
 3. **Answer ALL the questions on the question paper and hand this in at the end of the examination. Remember to write your name in the spaces provided.**
 4. Read the questions carefully.
 5. Use the total marks that can be awarded for each part of the questions in Question 1 and 2 as an indication of the detail required.
 6. It is in your own interest to write legibly and to present your work neatly.
 7. ONE blank page is included at the end of each section. If you run out of space for a question, use these pages. Clearly indicate the question number of your answer should you use this extra space.
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SECTION A

QUESTION 1

Refer to pages ii–v of the Source Material Booklet. Use this information as well as your own knowledge to answer the questions that follow.

1.1 What is meant by the following terms/phrases used in the text:

1.1.1 Distant cousins.

(2)

1.1.2 Species.

(3)

1.1.3 Evolution.

(2)

1.2 Is the evolution of flying squirrels and sugar gliders an example of convergent or divergent evolution? Give a reason for your answer.

(3)

- 1.3 Are the 'wings' used for flying in flying squirrels and sugar gliders homologous structures? Give a reason for your answer.

(3)

- 1.4 Using Charles Darwin's model of natural selection, explain how the sugar gliders and flying squirrels developed the structures to be able to 'fly'.

(6)

- 1.5 Using an examples from the text, explain how Lamarck would have explained the development of the piece of skin that allows flying squirrels and sugar gliders to fly.

(4)

- 1.6 What type of speciation would have caused the evolution of the sugar gliders and the flying squirrels. Give a reason for your answer.

(3)

- 1.7 Identify ONE way in which sugar gliders and flying squirrels are **similar** and ONE way in which they are **different**.

(2)

- 1.8 What can you deduce when looking at the distribution of sugar gliders and flying squirrels regarding their evolution?

(2)

[30]

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QUESTION 2

Refer to pages vi – x of the Source Material Booklet. Use this information as well as your own knowledge to answer the questions that follow.

- 2.1 Study the evolution of some hominids on page vi of the source booklet. State whether the following statements are true or false:

2.1.1 Species X can be identified as *Homo habilis*.

(1)

2.1.2 *Homo sapiens* and *Homo floresiensis* are more closely related than *Homo naledi* and *Homo erectus*.

(1)

2.1.3 All hominids on this diagram share a common ancestor.

(1)

- 2.2 According to some scientists, *Homo erectus* was the first hominin to make use of fire in a controlled environment. Suggest TWO ways in which this could have sped up the process of human evolution.

(2)

- 2.3 How does nuclear DNA evidence support the conclusion that *Homo neanderthalensis* is the closest human relative to *Homo sapiens*?

(3)

2.5 One of the key events of human evolution is the changes in the structure of the skeleton to become bipedal. Tabulate THREE skeletal features that could determine if a fossil is bipedal and **how** that feature would contribute to the upright position of the hominin.

2.6 Comment on the relevance of the difference in cranial capacity between *Homo neanderthalensis* and *Homo sapiens*.

(3)

- 2.7 Suggest a possible reason for *Homo neanderthalensis* going extinct.

(1)

- 2.8 Scientists have been mapping mitochondrial DNA from fossils of *Homo neanderthalensis* in order to pinpoint its position in the history of modern humans. Identify ONE problem they have encountered which makes their research less reliable/valid and suggest how this problem can be overcome.

(3)

- 2.9 Many *Homo neanderthalensis* fossils have been found in Europe, Central and South-West Asia. Most scientists have reached a consensus that human life originated in Africa. Briefly explain the 'Out-of-Africa' hypothesis.

(3)

- 2.10 Refer to the map of ancient dispersal of modern humans during the past 100 000 years. Human development in Australia was due to the founder effect. Explain the founder effect in relation to human evolution.

(3)

[30]

REMEMBER TO CLEARLY INDICATE AT THE QUESTION THAT YOU USED THE ADDITIONAL SPACE TO ENSURE THAT ALL ANSWERS ARE MARKED.

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SECTION B

Refer to pages xi – xvi of the Source Material Booklet.

QUESTION 3

Consider the following question:

Do you think there is enough evidence to prove that Punctuated Equilibrium occurred when there are no transitional fossils?

Using the source material provided as well as your own knowledge, discuss your opinion on the statement in the form of an essay of 2 ½ - 3 pages.

In your response you are expected to:

- Read the source material carefully.
- Take a definite stand on the statement.
- Plan your essay before you start writing. Your planning will be marked.
- Present a debated argument. Use relevant information from sources A – G as well as your own knowledge of Life Sciences to support your point of view.
- Arrange the information to best develop your argument.
- Write in a scientifically appropriate way.
- **In your essay, ensure that you have discussed at least nine different facts from the sources.**

40 marks

Total: 100 marks

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