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ST DOMINIC'S SCHOOL FOR GIRLS

GRADE 12 LIFE SCIENCES

PRELIMINARY EXAMINATION PAPER 2 2023

Examiner:	M Smith	Date:	13 September 2023
Moderator/s:	J Lang	Time:	2 Hours
		Marks:	100

Name of student:	
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INSTRUCTIONS TO STUDENTS:

- This question paper consists of 11 pages.
- There are THREE questions.
- Answer all questions in the spaces provided.
- There is a lined page at the end of the question paper for corrections to answers.
- Write legibly and present your work neatly.
- Use the total marks awarded for each question as an indication of the detail required.

Question	My Mark	Possible Mark
1		30
2		30
3		40
TOTAL		100

Good Luck!

SECTION A

QUESTION 1

- 1.1 What term is used to describe what Darwin meant with “one species had been taken and modified for different ends.” (Circle the letter of the most correct answer)
- A Inheritance of acquired characteristics
- B Adaptive radiation
- C Genetic drift (2)
- 1.2 What was the name of the theory that Darwin elaborated in his book “The origin of Species”?
- _____ (2)
- 1.3 Darwin made four observations that led him to propose his theory. Use the example of the change in the beaks in Greenish Warblers to describe the observations that Darwin made.
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____ (8)
- 1.4 What is the name of the diagram shown in SOURCE 3?
- _____ (1)
- 1.5 The diagram in SOURCE 3 was created by looking at the difference in mitochondrial DNA. Name 3 other sources of evidence that scientists use to support the idea of evolution?
- _____
- _____
- _____ (3)

- 1.6 How many distinct clades of Greenish Warbler, evolved from the ancestral species? (Circle the letter of the most correct answer)
- A 2
- B 3
- C 6
- (1)

1.7.1 Describe what is meant by the term “gene flow”.

(2)

1.7.2 Name one mechanism of reproductive isolation that prevents gene flow between Greenish Warblers from region E and H.

(2)

1.8 Does the evidence of a “ring species” show macro-evolution or micro-evolution?

(2)

1.9 Is this example, shown by the Greenish Warblers, allopatric speciation or sympatric speciation? Explain why.

(2)

1.10 Were the Californian scientists correct in concluding that the two populations of Greenish Warbler in Siberia had evolved into two distinct species? Explain your answer by referring to the definition of a species.

(5)

[30 MARKS]

QUESTION 2

2.1 Using the information provided, state whether the following statements are True or False.

2.1.1 *Homo naledi* is named after the cave where its bones were found.

_____ (1)

2.1.2 From the early 1990s to the beginning of the 21st century, many new hominid fossils were found in South Africa.

_____ (1)

2.1.3 Analysis of the sediments in the cave which covered *Homo naledi* fossils gives their exact geological age.

_____ (1)

2.1.4 It is hypothesized that *Homo naledi*, like modern humans, disposed of their dead.

_____ (1)

2.1.5 *Homo habilis* left Africa and moved into other parts of the world where regional populations slowly evolved into modern humans.

_____ (1)

2.2 Compare the braincases of *Homo naledi* and *Homo sapiens* and state one of the evolutionary implications of these differences.

_____ (3)

2.3 *Homo naledi* has been described by scientists in the following way: "You could almost draw a line through the hips – primitive above, modern below."

Explain what is meant by this statement and refer to specific features in the image found in SOURCE 3.

2.4 Study the diagrams of the foot bones in SOURCE 2.

2.4.1 Using visible features, arrange the diagrams in order of most primitive to most evolved foot structure. Write only the letters A to C in the correct order.

_____ (1)

2.4.2 How do the arrangements/structures of foot bones indicate bipedalism? Refer to relevant features you see in the diagrams.

_____ (2)

2.4.3 Why is bipedalism an important development in the history of modern humans?

_____ (4)

2.5 Draw a simple timeline of the South African hominids as listed below, including modern humans, which are described in the source. Your timeline must show dates of when they lived. Include the relative position of *Homo naledi* to show where you suggest it would fit into the evolutionary history of humans.

Show only the following hominids and the geological times mentioned in the source. (The timeline does not have to be to scale.)

Australopithecus sediba

Homo naledi

Homo sapiens

Australopithecus africanus

- 2.6 Do you think Dr Berger was correct to classify *Homo naledi* in the genus *Homo*? Justify your answer using information given.

(4)

[30 Marks]

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SECTION B

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

QUESTION 3

Is it possible for Evolution to go backwards? (Regressive Evolution or Devolution)

Using the source material provided as well as your own knowledge, discuss your opinion on the question in the form of an essay of 2½–3 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 plan will be marked.
- Present a debated argument, using relevant information from sources A to I as well as your own knowledge of biology, to support your point of view.
- Write your plan and your essay on the lined pages that follow.
- 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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REMEMBER TO CLEARLY INDICATE AT THE QUESTION THAT YOU USED THE ADDITIONAL SPACE TO ENSURE THAT ALL ANSWERS ARE MARKED.

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