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PRELIMINARY EXAMINATION: PAPER 2

Examiner: Ms T Wilmans

Time: 2 Hours

Grade: 12

Moderator: Ms J Calder

Total : 100 marks

Date: 8 September 2023

NAME: _____

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 12 pages with a Source Material Booklet of 16 pages.
Please check that your question paper is complete.
2. Write your name in the space provided above.
3. The question paper consists of three questions. Question 1 and Question 2 are case studies and Question 3 is an essay.
4. Read the sources provided in the Source Material Booklet and use this information and your own knowledge to answer Questions 1 and 2.
5. Source material is also provided in the Source Material Booklet for the essay. Use this information and your own knowledge to first plan and then write your response.
6. All questions, including the essay, must be answered in the booklet provided. No additional paper will be given to you.
7. Read the questions carefully.
8. 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.
9. It is in your own interest to write legibly and to present your work neatly.

SECTION A

QUESTION 1

Refer to pages 1 – 4 of the Source Material Booklet. Use this information as well your own knowledge to answer the questions that follow.

1.1 Define adaptive radiation.

(1)

1.2 Source A refers to the 'divergent camouflage of feather lice ' Explain what is meant by 'divergent evolution'.

(3)

1.3 Differentiate between 'microevolution' and 'macroevolution.'

(4)

1.5 Source B describes how “the bees moved north, diversifying and spreading in a parallel partnership with angiosperms”.

1.6 Explain why the study of bee evolution is ecologically important.

1.7 Refer to Source C to answer the questions that follow.

b) How long ago did hunting wasps and bees last share a common ancestor?

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- c) Refer to the Family Coreidae to identify which sub-family is most closely related to Xeromelissinae.

_____ (1)

- d) Which family shared a common ancestor most recently with the family Apidae?

_____ (1)

1.8 Explain how mosquito populations developed insecticide resistance over time.

_____ (4)

1.9 Refer to the graph shown in Source E to answer the questions that follow.

- a) Identify the dependent variable in the investigation.

_____ (2)

- b) What percentage of resistant mosquitoes survived the 2-hour investigation?

_____ (1)

1.10 Explain the effect of increased resistance in mosquito populations on the economy.

_____ (3)

[30]

QUESTION 2

Refer to pages 5 – 7 of the Source Material Booklet. Use this information as well your own knowledge to answer the questions that follow.

- 2.1 Source A states that 'jaw-size is driven more by usage than genetics. Identify the correct term for a non-inherited trait that develops as a result of its repeated use.
- _____ (1)
- 2.2 The text mentions how wisdom teeth no longer serve a purpose in modern humans. What is the correct term for a structure which no longer has a function or serves its original purpose?
- _____ (1)
- 2.3 Identify ONE additional example of the structure identified above in modern humans.
- _____ (1)
- 2.4 Briefly explain how 'diverging diets' resulted in geographical differences in the structure of hominin jaws.
- _____
- _____
- _____
- _____
- _____
- _____ (3)
- 2.5 Source A states that; 'the size and shape of the jaw is not only controlled by genes, but also strongly affected by the environment, such as how much it has to chew.'
- Which famous scientist focussed on an organism's response to their environment as opposed to their inherited traits?
- _____ (1)
- 2.6 Explain why early hunter-gatherers required larger and stronger jaws compared to recent hominin species.
- _____
- _____
- _____
- _____ (3)

- 2.7 Describe an additional change that occurred in the structure of early hominins; excluding their jaws, teeth or skulls, which occurred as a result of agriculture.

(1)

- 2.8 Explain a possible reason for the change identified in Question 2.7.

(2)

- 2.9 Which hominin species was the first to show evidence of tool use?

(1)

- 2.10 Which hominin species was the first to manipulate fire or cook their food?

(1)

- 2.11 Refer to Source C to answer the questions that follow.

- a) Describe the trend observed in the hominin dentition shown in the diagrams provided in Source C.

(2)

- b) Describe the trend observed in the hominin palate shown in the diagrams provided in Source C.

(2)

- c) Explain why the change in hominin diet resulted in the changed observed in the hominin palate over time.

(3)

2.13 Explain any TWO advantages that agriculture provided for early hominins.

2.14 Describe the social impact of agriculture on hominin evolution.

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QUESTION 3

New evidence on human evolution has some scientists questioning the Out-of-Africa Hypothesis in favour of the multi-regional hypothesis, or for a new alternative all together.

Other scientists believe that although new information reveals the need to re-examine certain details, it does not provide sufficient evidence to disprove the Out-of-Africa Hypothesis as a whole.

Evidence from recent discoveries on human origins has not discredited nor contradicted the Out-of-Africa Hypothesis.

Using the source material provided as well as your own knowledge, discuss your opinion on the above statement in the form of a 2½ – 3 page essay.

To answer this question, you are expected to:

- Read the source material carefully and present a debated argument to illustrate your point of view.
- Select relevant information from sources A to O in the Source Booklet.
- It is important to integrate your own relevant biological knowledge.
- Take a definite stand on the question and arrange the information to best develop your argument.
- Write in a way that is scientifically appropriate and communicates your point of view clearly.
- **Provide** a clear **plan** of your essay before you start writing. Note that the plan will be marked as part of the assessment of this question.

[40]

GRAND TOTAL = 100

BEGIN QUESTION 3 ON THE NEXT PAGE

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