Student Name: _____

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BIOLOGY 2016

Unit 4
Key Topic Test 7 – Human Evolution

Recommended writing time*: 45 minutes
Total number of marks available: 45 marks

QUESTION BOOK

* The recommended writing time is a guide to the time students should take to complete this test. Teachers may wish to alter this time and can do so at their own discretion.

Conditions and restrictions

- Students are permitted to bring into the room for this test: pens, pencils, highlighters, erasers, sharpeners and rulers.
- Students are NOT permitted to bring into the room for this test: blank sheets of paper and/or white out liquid/tape.
- No calculator is permitted in this test.

Materials supplied

- Question and answer book of 11 pages.

Instructions

- Print your name in the space provided on the top of the front page.
- All written responses must be in English.

Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic communication devices into the room for this test.

SECTION A – Multiple-choice questions

Instructions for Section A

Select the response that is **most correct** for the question. A correct answer scores 1, an incorrect answer scores 0. Marks are not deducted for incorrect answers. If more than 1 answer is completed for any question, no mark will be given.

Question 1

Which of the following is not a characteristic of all primates?

A. Bicuspid teeth
B. Short nose
C. Highly folded cerebral cortex of the brain
D. Highly developed eyes with binocular vision

Question 2

Megafauna fossils found in Australia suggest that human hunting possibly lead to the extinction of these great mammals. Which of the following pieces of evidence would confirm that this occurred.

A. Increased brain capacity in humans due to consuming meat
B. The presence of stone cooking tools
C. The presence of non-naturally induced markings on bone fragments
D. Skins used for shelter found in ancient community areas

Question 3

Which of the following statements best describes the multiregional hypothesis of hominin evolution?

A. Modern humans evolved from a single region and then spread out around the globe
B. After diverging from a common ancestor hominin dispersed, however, gene flow was maintained between the populations
C. Natural selection occurred in a region of Africa and during the shifts in weather patterns the formation of land bridges allowed hominin to move into multiple regions
D. Hominin from around the globe were able to come together in Africa and exchange genetic material to allow greater gene flow

Question 4

Bones of an unknown primate were found by palaeontologists, they appeared to have a relatively large brain cavity and evidence of cuts in the bone suggest some form of amputation has occurred. Which of the following species is it most likely to have come from?

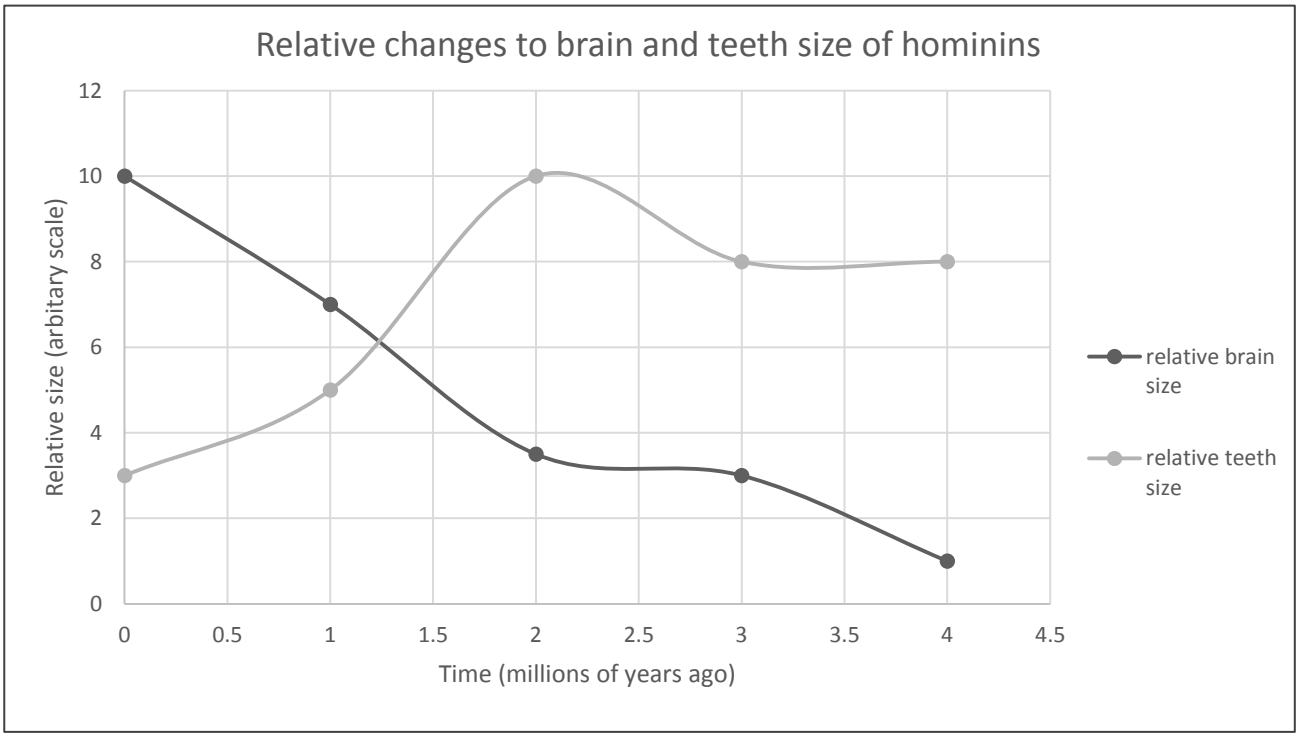
A. Gorilla
B. Chimpanzee
C. Early hominin
D. Modern hominin

Question 5

The development of a larger gluteus maximus in human species allowed which of the following mechanisms to occur?

A. A straighter spine
B. The ability to tilt the pelvis forward
C. A wider walking gait
D. Less weight carried in the central area of the body for greater locomotion

Use the following graph to answer questions 6 to 8



Question 6

In which time period was there the greatest increase in brain size?

A. 2 to 1 million years ago
B. 1 to 0 million years ago
C. 4 to 3 million years ago
D. 3 to 2 million years ago

Question 7

Based on the data given, which of the following statements would be correct about the evolution of brain and teeth size in hominins.

A. The larger brain size demanded greater energy requirements of the species
B. The larger molar teeth would have assisted in the crushing of meat for digestion
C. Increased brain size is always an indication of increased intelligence
D. The presence of smaller teeth would assist in the greater breakdown of food products to assist in energy requirements

Question 8

Which of the following hypothesises would best describe a reason as to why the trends outlined in the graph exist?

A. The reduction in teeth size allowed for greater bone area for the brain to develop to greater size
B. The increased brain size allowed greater thinking capacity and thus a selective advantage for survival.
C. Reduced energy requirements and a decreased need for large portions of food resulted in reduced teeth size
D. Cultural evolution suggests that larger skull and brain size were a desired trait in mates

Question 9

Using your understanding of primate and hominin evolution, which of the following is incorrect about the position of the foramen magnum.

A. The further back the foramen magnum, the greater the chance of upright bipedalism
B. The further forward the foramen magnum, the greater the chance of upright bipedalism
C. Some primates are incapable of bipedalism despite having a further forward foramen magnum
D. The position of the foramen magnum in humans and Neanderthals is considerably more forward than that of a gorilla

Question 10

Scientist have not found a missing link between current apes and humans. The most current research indicates that this is due to:

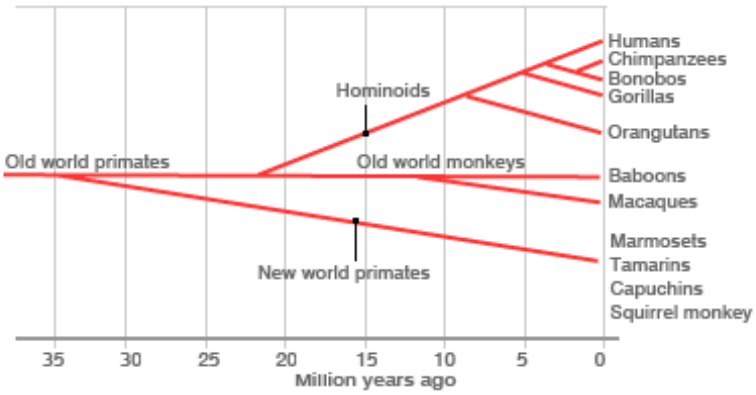
A. They have not yet found the fossils that determine this linkage
B. DNA evidence suggests that both humans and apes share 99% of their DNA so this is enough evidence to show that humans evolved from apes
C. Humans and apes both diverged from a common ancestor and thus there is no link between the two
D. Apes have not evolved since humans branched off their evolutionary line

SECTION B- Short-answer questions

Instructions for Section B
Answer all questions in the spaces provided.

Question 1 (12 marks)

The following is a scientist's theorized understanding of the evolution of modern day species based on previous research**.**



a. Fill in the graph below based on your understanding of characterises in the evolution of old world primates.

Divergence line	Notable characteristic (that distinguishes them from other lines listed)
Human	
Hominoids	
New world primates	

3 marks

b. Which two species have diverged most recently? Outline the evidence that allowed this conclusion.

2 marks

c. List 3 different methods that scientists may have used to develop this evolutionary tree

3 marks

d. Outline two benefits of having a big toe that diverges as seen in old world primates.

2 marks

e. Outline two benefits of bipedalism in humans.

2 marks

Question 2 (10 marks)

Determine which statements are true or false and provide reasoning to support your response.

a. Humans have a larger frontal brain region than other primates.

2 marks

b. Bipedalism is thought to have evolved to allow movement of primates from the trees to the land.

2 marks

c. Hominins other than humans were unable to walk upright

2 marks

d. The utilization of tools is an example of human evolution

2 marks

e. The only *Hominins* are humans

2 marks

Question 3 (4 marks)

Cultural evolution has played a large part in changes that have led to the technologically savvy world that we see today. Whilst in some households it is now acceptable to have mobile technology at the dinner table, the lack of direct face to face interaction would have been highly frowned upon in a social setting 30 years ago.

a. Outline one aspect of cultural evolution that promoted social interaction 40,000 years ago.

1 mark

b. Outline one aspect of cultural evolution the promoted social interaction 100 years ago.

1 mark

c. It has been suggested that modern day cultural evolution in humans evolves quicker than naturally selected based evolution. Explain.

_____

_____

_____

2 marks

d. Outline two impacts that the development of agriculture had on cultural evolution.

_____

_____

_____

2 marks

Question 4 (7 marks)

Neanderthals and humans shared many similar characteristics, including the use of sophisticated tools, wearing clothing and aspects of cultural evolution. They are thought to have lived in Asian regions up to around 30,000 years ago and genetic analysis suggests that non-African humans today share around 1-4% Neanderthal genetic material.

a. Name the theory supports that non-African humans having Neanderthal genetic material present in their genome and explain why this has occurred.

_____

_____

_____

2 marks

b. Explain the mechanism of evolution occurred to produce the human and Neanderthal species?

1 mark

c. Outline 2 visual characteristics that could assist in distinguishing the difference between human and Neanderthal remains found in regions around the world.

2 marks

Within the human species, there are multiple races that have very different distinguishable characteristics.

d. Why are the different races not considered different species

1 mark

e. Determine one reason as to why the current human species would be less likely to evolve into new subspecies over periods of time?

1 mark

END OF KEY TOPIC TEST