

Evolution

Total marks : 19

Q1.

Answer the question with a cross in the box you think is correct . If you change your mind about an answer, put a line through the box and then mark your new answer with a cross .

Stone tools can be found at sites used by our human ancestors.

Figure 3 shows tool P.

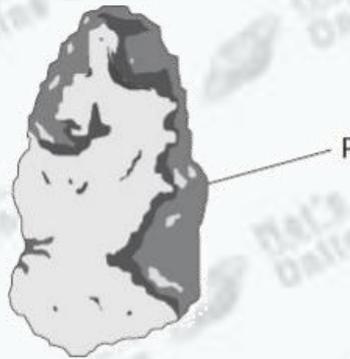


Figure 3

(i) Describe how tool P was made.

(2)

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.....

.....

(ii) Figure 4 shows tool Q which was found at the same site as tool P.

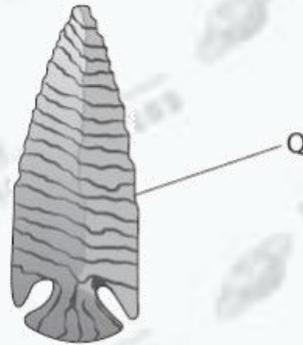


Figure 4

A scientist stated that tool Q was made by a more evolved human ancestor than tool P.
Which observation supports this statement?

- A tool Q is a darker colour than tool P
- B tool Q is more pointed than tool P
- C tool Q is a lighter colour than tool P
- D tool Q is less pointed than tool P

(1)

(iii) Tools provide evidence for human evolution.

Use words from the box to complete the sentences.

(2)

enlarge	human	migrate
mutate	natural	negative

Evolution is the change of inherited characteristics through
..... selection.

These changes occur because genes

(Total for question = 5 marks)

Q2.

The book 'On the Origin of Species' was published in 1859.

This book describes the theory of evolution.

One chapter of this book discusses pentadactyl limbs.

Figure 5 shows the bones of the pentadactyl limbs of three mammals.

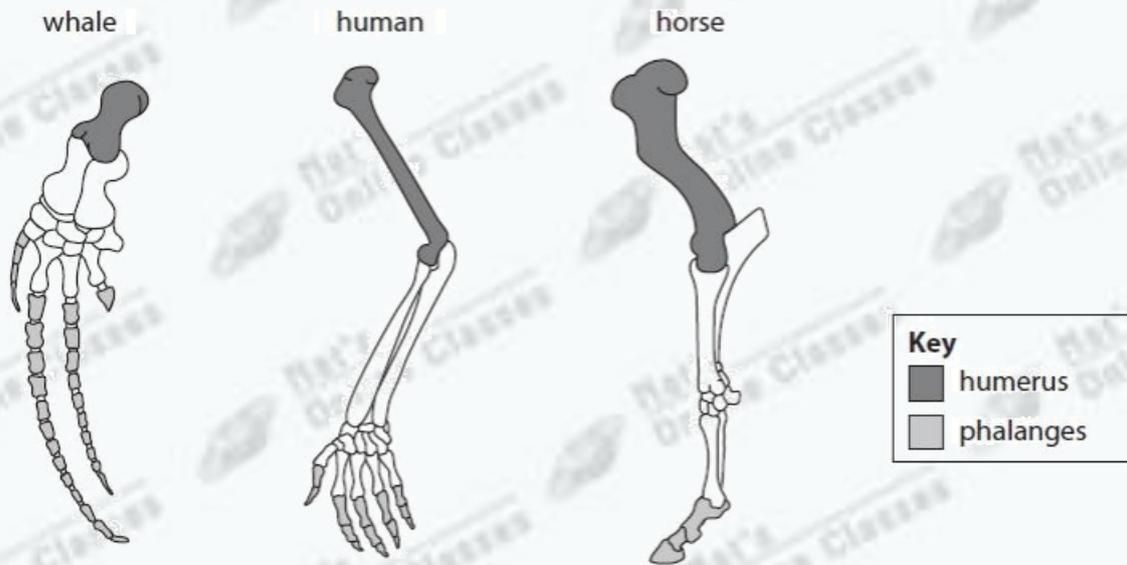


Figure 5

(i) Describe **one** difference between the humerus of the whale and the humerus of the human.

(1)

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.....

(ii) Describe **one** difference between the phalanges of the horse and the phalanges of the human.

(1)

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.....

(Total for question = 2 marks)

Q3.

Figure 7 shows the limbs of five animals.

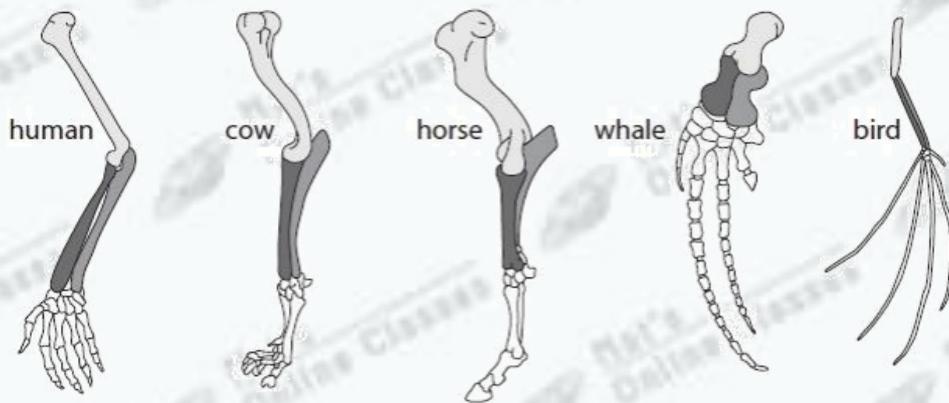


Figure 7

Describe how the structure of these limbs provides scientists with evidence for evolution.

(3)

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(Total for question = 3 marks)

Q4.

Alfred Russel Wallace travelled around Malaysia during the 1800s and wrote to Charles Darwin about the animal species he studied.

His main conclusions were very similar to those of Charles Darwin and they both contributed to the current understanding of evolution.

Describe the theory of evolution by natural selection.

(3)

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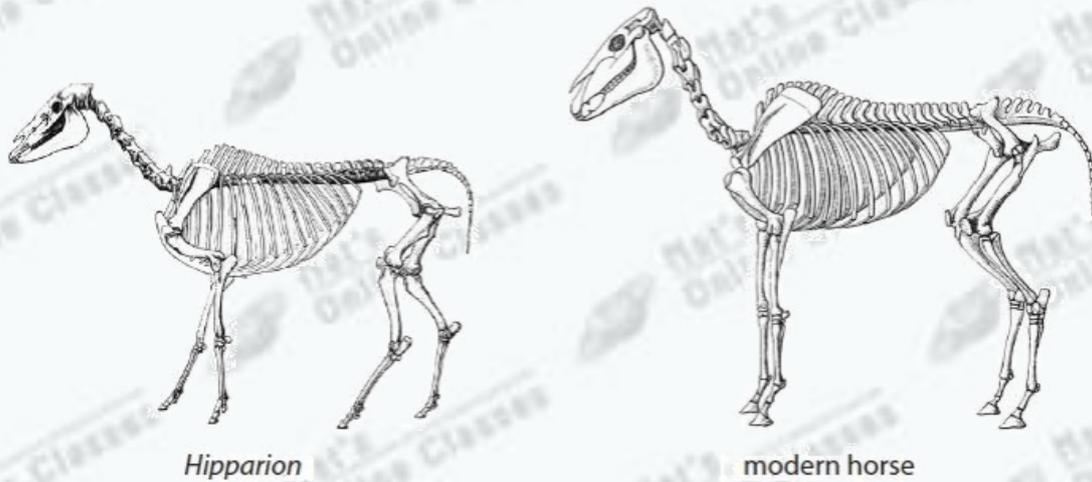
.....

(Total for question = 3 marks)

Q5.

Hipparion is an extinct genus of horse that lived between approximately 20 million and 0.8 million years ago.

Figure 10 shows the skeletons of a *Hipparion* and a modern horse.



(Sources: © Morphart Creation/Shutterstock and © Hein Nouwens/Shutterstock)

Figure 10

(i) Give **one** method that can be used to date a fossil of a *Hipparion*.

(1)

.....
.....

(ii) Give **one** reason why scientists have concluded that the modern horse has evolved from *Hipparion*.

(1)

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.....

(Total for question = 2 marks)

Q6.

Figure 13 shows the pentadactyl limb of a bat and a cat.



Figure 13

(i) Describe the reasons why the anatomy of the pentadactyl limb suggests that bats and cats evolved from a common ancestor.

(2)

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(ii) Genetic analysis also provides evidence for evolution.

Scientists can sequence genes from different organisms.

Describe how this type of genetic analysis provides evidence for evolution.

(2)

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(Total for question = 4 marks)

Mark scheme :

Q1.

Question number	Answer	Additional guidance	Mark
(i)	A description including two from: <ul style="list-style-type: none"> • by hitting it (1) • with another stone / rock / flint / something hard (1) • to knock flakes /chips off (1) 	not just another object accept knapped (2)	(2) A02 1

Question number	Answer	Mark
(ii)	B tool Q is more pointed than tool P The only correct answer is B <i>A is incorrect because colour does not tell you how advanced the maker of the tool was.</i> <i>C is incorrect because colour does not tell you how advanced the maker of the tool was.</i> <i>D is incorrect because Q is more pointed than P.</i>	(1) A03 2a

Question number	Answer	Mark
(iii)	<ul style="list-style-type: none"> • natural (1) • mutate (1) Must be in the correct order Reject migrate against either mark	(2) A01 1

Q2.

Question number	Answer	Additional guidance	Mark
(i)	the whale humerus is shorter / wider / stubbier	accept whale humerus is less likely to break / is stronger accept reverse arguments for humerus of human	(1) AO2 1

Question number	Answer	Additional guidance	Mark
(ii)	the horse has fewer phalanges	the horse has 3 phalanges whereas the human has 14 phalanges accept humans have smaller phalanges / the horse phalanges are thicker / stronger accept reverse arguments for human	(1) AO2 1

Q3.

Question number	Answer	Additional Guidance	Mark
(c)	<p>A description linking three of the following:</p> <ul style="list-style-type: none">• they have a pentadactyl limb (1)• suggesting a common ancestor (1)• that also had a {pentadactyl limb / this limb structure} (1)• how the structure has been adapted to different functions / description of the adaptations for a function (1)	<p>accept they have a similar bone structure / description of the bone structure</p> <p>ignore similar limb structure</p> <p>accept unlikely to have descended from different ancestors</p>	<p>(3)</p> <p>A01 1</p>

Q4.

Question number	Answer	Additional guidance	Mark
	<p>A description including three of the following:</p> <ul style="list-style-type: none"> • overproduction of offspring (1) • organisms in a species have {variation / mutations} (1) • there is {a struggle for existence / selection pressure / competition} (1) • the adapted organisms survive (1) • (reproduction leads to) offspring inheriting {characteristics / gene / allele / adaptation / trait} (1) • this is repeated over many generations (1) 	<p>accept there are differences within {species/organisms}</p> <p>accept named selection pressure /change in the environment</p> <p>accept survival of the fittest accept not adapted organisms die</p>	<p>(3)</p> <p>AO2 1</p>

Q5.

Question Number	Answer	Additional Guidance	Mark
(i)	location in the rock layer / age of fossils surrounding it	<p>accept radiometric dating / stratigraphy / comparison to other <i>Hipparion</i> fossils</p> <p>ignore carbon dating</p>	<p>(1)</p> <p>AO2 1</p>

Question Number	Answer	Additional Guidance	Mark
(ii)	similar (pentadactyl) limb structure / similarities in the {skeleton / bone} structure	ignore similar body shape	<p>(1)</p> <p>AO3</p>

Q6.

Question Number	Answer	Additional guidance	Mark
(i)	<ul style="list-style-type: none">• same structure of bones/examples of bone structure (1)• (structure is) unlikely to have occurred more than once during evolution / common ancestor had {the pentadactyl limb structure / similar limb structure} (1)	accept unlikely that different ancestors would have had the same structures	(2) AO 2 1

Question Number	Answer	Additional guidance	Mark
(ii)	<ul style="list-style-type: none">• compare the {genes/sequence of genes} from different organisms (1)• closely related organisms have {more similar/identical} sequences /differences in sequence can show evolution (1)	accept idea of identifying similarities and differences in the {genes/sequences} accept organisms with similar gene sequences share a common ancestor	(2) AO 1 1