

Multiple choice questions

1. Which of the following are pentadactyl limbs
 - I Bee front leg
 - II Bird wing
 - III Dolphin flipper
 - A II only
 - B I and II only
 - C I and III only
 - D II and III only
2. An endemic species is best described as a species that is found ...
 - A. On an island
 - B. In a certain geographical area
 - C. Breeding with other species
 - D. After speciation
3. Analogous structures are similar because of
 - A. Common ancestry
 - B. Identical appearance
 - C. Convergent evolution
 - D. Artificial selection
4. The figwort family (a member of the Angiosperms) has been reclassified based on evidence not available when the family was first proposed in 1789. This evidence was based on
 - A. The use of microscopes
 - B. Histological studies
 - C. Studies into Ribosome size
 - D. Comparisons of chloroplast DNA
5. Speciation can occur when
 - I. Two species interbreed
 - II. Geographical isolation occurs
 - III. Two populations cohabit the same area but do not interbreed
 - A I only
 - B I and II only
 - C II and III only
 - D I, II and III



6. The characteristics that develop during the lifetime of an individual are
- A. Heritable
 - B. Inherited
 - C. Acquired
 - D. Learnt
7. The binomial system of nomenclatures used by scientist is
- A. A means of classifying species
 - B. An international system of nomenclature
 - C. To avoid confusion from translation from different languages
 - D. In order to give names to new species
8. The correct format to write the binomial name for the Western Gorilla is
- A. Gorilla gorilla
 - B. G gorilla
 - C. *Gorilla gorilla*
 - D. *Western gorilla*
9. In cladistics, reclassification is most likely to occur when ...
- A. New organisms are discovered
 - B. Evidence of evolutionary relationships are discovered
 - C. Biologists decide that a binomial name is incorrect
 - D. Morphology changes
10. The hierarchy of taxa used to classify eukaryotes, from the group containing the highest number of species is ...
- A. Kingdom, Family, Class, Order, Phylum, Genus, Species
 - B. Three domains of life containing many Phyla
 - C. Kingdom, Phylum, Class, Order, Family, Genus, Species
 - D. Groups of Phyla with increasing numbers of species



Structured answer questions

11. The olinguito is a newly discovered species of the class Mammalia. Predict three characteristics possessed by the olinguito. (3 marks)

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12. Define the term “clade” used in cladistics. (2 marks)

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13. In cladistics, the construction of cladograms shows the most probable evolutionary relationships between organisms. List three types of evidence on which a cladogram can be drawn and explain why a cladogram is drawn using more than one piece of evidence. (5 marks)

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14. Explain why antibiotic resistance in bacteria is an example of natural selection. (2 marks)

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15. Give two reasons why it is necessary that international groups of scientists decide upon the generic name of a species. (2 marks)

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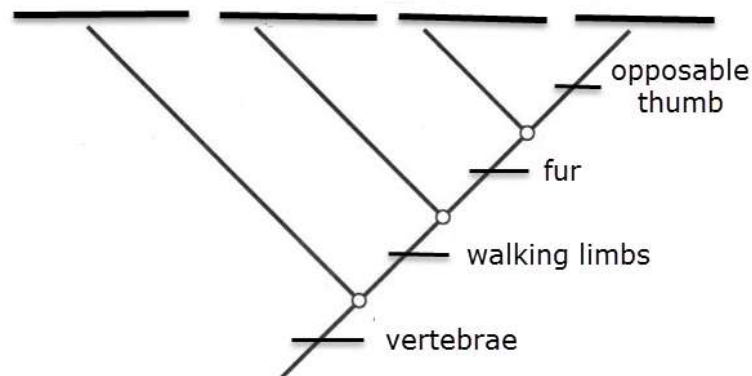
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16. Complete the following table describing the characteristics of the three domains. (8 marks)

Characteristic feature	Domain		
	Bacteria	Archaea	Eukaryota
Structure of cell walls		Never contain peptidoglycans	
DNA association with protein			Histone proteins always associated with DNA
Form of glycerol esters in cell membranes			d-form of Glycerol, no side chains
Presence of introns in genes			Common



17. Label the positions of the following animals in the cladogram below (4 marks)
- Chimpanzee, goldfish, lizard, rat



18. Mutations in DNA occur at a relatively constant rate. Mitochondrial DNA has been studied in many species. Explain why studies of mitochondrial DNA are a useful tool for developing cladograms based on the idea of a molecular clock showing when various organisms diverged from a common ancestor. (3 marks)

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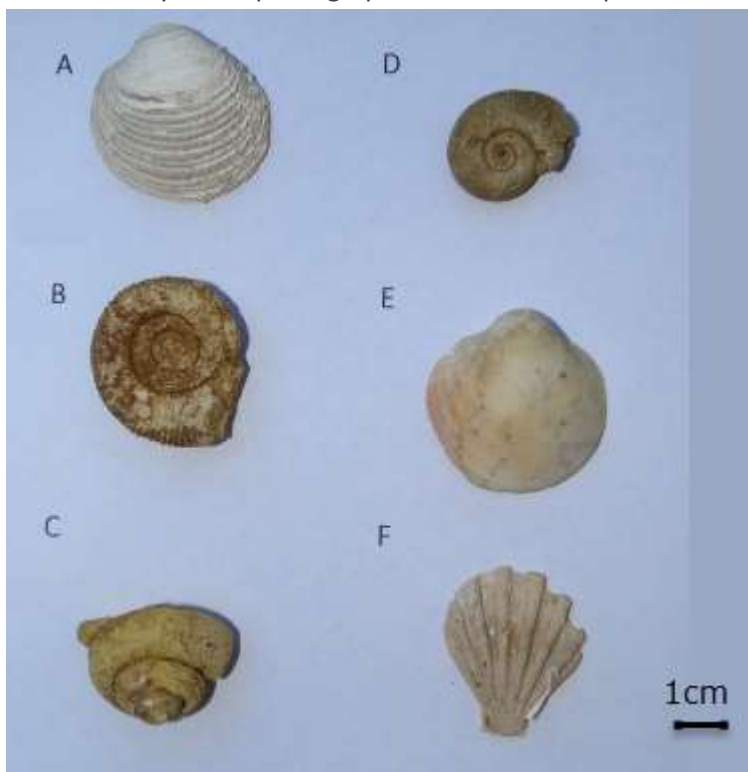
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19. Explain how natural selection causes changes in gene frequency within a population over many generations (4 marks)

This image shows a full page of white paper with horizontal dashed lines, typical of primary school writing paper. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

20. The photograph shows fossil shells.

Look carefully at the photograph and answer the questions below.



a. The scale bar is 1cm long. Calculate the maximum width of shell A.

Show your working.

(2 marks)

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b. Deduce which modern Phylum these organisms most closely resemble and explain why?

(2 marks)

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c. Suggest why fossils of this type are relatively common?

(1 mark)

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- d. Design a dichotomous key to differentiate between these fossils. (6 marks)

The following words may help (you may also use others)

Ridge, whorl, rib, apex, cone, aperture, band,

Key:

