

Advanced Palaeontological Science

Palaeontology · Answer Key · 8 Questions

1. Which specific clade of archosaurs is defined by the presence of a perforate acetabulum and an elongated deltopectoral crest on the humerus?

- A) Pseudosuchia
- B) Dinosauria**
- C) Pterosauria
- D) Ornithodira

2. In the context of the Cambrian Explosion, which fossil assemblage is most noted for preserving soft-bodied organisms via Burgess Shale-type carbonaceous film preservation?

- A) Chengjiang biota**
- B) Ediacara biota
- C) Doushantuo Formation
- D) Nama Group

3. The 'Great Unconformity' represents a significant gap in the geological record globally; which biological transition is often associated with the strata immediately overlying it?

- A) The rise of the first eukaryotes
- B) The proliferation of complex metazoans**
- C) The Devonian terrestrialization
- D) The K-Pg extinction recovery

4. Which mineral replacement process occurs when the internal structure of wood is preserved at the cellular level by silica, often via hydrothermal fluids?

- A) Carbonization
- B) Permineralization
- C) Silicification**
- D) Replacement

5. What is the primary diagnostic feature used to distinguish members of the subclass Ornithischia from Saurischia?

- A) The presence of gastroliths
- B) The orientation of the pubis bone**
- C) The development of feathers
- D) The tooth-to-jaw ratio

6. In palaeoclimatology, the delta 18O ($\delta^{18}\text{O}$) ratio found in marine carbonate microfossils is primarily used as a proxy for which variable?

A) Atmospheric CO₂ concentrations

B) Global ice volume and water temperature

C) Salinity levels in estuarine environments

D) Primary productivity of phytoplankton

7. The transition from lobe-finned fish to tetrapods is best exemplified by which Devonian-aged genus possessing both fish-like scales and tetrapod-like limb bones?

A) Acanthostega

B) Ichthyostega

C) Tiktaalik

D) Eusthenopteron

8. Which of the following describes the 'Lazarus taxon' phenomenon in the fossil record?

A) Rapid evolutionary radiation following an extinction event

B) The reappearance of a taxon in the fossil record after a period of apparent absence

C) The convergent evolution of unrelated species in isolated ecosystems

D) The fossilization of trace fossils instead of body fossils