

Paper 6: Paleontology

Topic

Nature and importance of fossil record; Fossilization processes and modes of preservation; Species concept with special reference to palaeontology, Taxonomic hierarchy; Theory of organic evolution interpreted from fossil record (9 lectures)

Brief introduction to important invertebrate groups (Bivalvia, Gastropoda, Brachiopoda) and their biostratigraphic significance. Significance of ammonites in Mesozoic biostratigraphy and their paleobiogeographic implication. Functional adaptation in trilobites and ammonoids. (11 lectures)

Application of Ichnology in paleoenvironmental reconstruction.

(2 lectures)

Origin of vertebrates and major steps in vertebrate evolution. Mesozoic reptiles with special reference to origin diversity and extinction of dinosaurs Evolution of horse and intercontinental migrations. Human evolution. (9 lectures)

Early plant life, first land plants, vascular plants and carboniferous coal forests. Mesozoic plant life – gymnosperms, origin of angiosperms. Gondwana flora of India, distribution and climate. (5 lectures)

Introduction to microfossils and Palynofossils and their application (4 lectures)

Application of fossils in biostratigraphy, -biozones, index fossils, correlation; role of fossils in sequence stratigraphy. Fossils and palaeoenvironmental analysis. Fossils and palaeobiogeography, biogeographic provinces, dispersals and barriers Palaeoecology – fossils as a window to the evolution of ecosystems (5 lectures)

12 rounds of student presentations will be arranged in Groups on different topics covered under Theory

Practicals:

(12 lectures)

Study of fossils showing various modes of preservation.

Study of diagnostic morphological characters, systematic position, stratigraphic position and age of various invertebrate, vertebrate and plant fossils

Titles of Projects:

1. Mineralization processes in different groups of invertebrates
2. Morphometric Studies of fossils
3. Taphonomic study of vertebrate fossils
4. Functional morphology of fossils

5. Biogeoprovinces
6. Behavior in trace fossils

Suggested Readings

Principles of Palaeontology by Raup, D.M. & Stanley, S.M., W.H. Freeman, 1971.
Invertebrate palaeontology and evolution by Clarkson, E.N.K., Blackwell 4th Edition 2012
Vertebrate Palaeontology by Benton, M.J., Blackwell, 2005
Essentials of Palaeontology by Mishra & Shukla, Vikas Publisher 1982
Microfossils. By Armstrong, H.A., and Brasier, M.D., Blackwell, 2005