PLANT DIVERSITY II (PTERIDOPHYTES, GYMNOSPERMS & PALAEOBOTANY) (BPS 512)

S. No.	Topics
1.	**Pteridophytes:** Classification (G.M. Smith) of Pteridophytes – General aspects of the Psilopsida, Lycopsida, Sphenopsida and Pteropsida. Origin of Pteridophytes: Telome theory; Origin of Leaves; Origin of sporophylls; Origin of roots; Stelar system in Pteridophytes; Comparative account of the important characters of the Psilotopsida, Eligulopsida and Ligulopsida.
2.	**Experimental studies in Pteridophytes:** Sexuality of Equisetum, Sexuality of homosporous ferns, regulatory role of light, hormonal control of antheridial differentiation and archegonial differentiation. Experimental studies on the development of gametophyte, regeneration of gametophyte. Reproductive physiology in relevance to genetics. Sporophytes in Pteridophytes. Heterospory and seed habit in Pteridophytes. Economic importance of Pteridophytes.
3.	**Gymnosperms:** Classification of Gymnosperms by Sporne. General characters of the following orders: Psilophytales, Lepidodendrales, Sphenophyllales and Coenopteridales. Salient features of the following orders: Class- Cycadopsida; Order: Ptridospermales & Pentaxylales, Class- Coniferopsida; Order: Coniferales, Taxales & Ginkgoales. Class- Gnetopsida; Order: Gentales.
4.	Evolutionary tendencies among Gymnosperms, Comparative account of important characters of Cycas and Pinus. Comparative account of important characters of Gnetum and Ephedra. Primary and secondary structure of wood in coniferales only. Organization of male and female cones. Development of male and female gametophytes and embryogeny of class Coniferopsida only. Experimental studies in Gymnosperms. Economic importance of Gymnosperms.
5.	**Palaeobotany:** Definition of fossil, process of fossilization, types of fossils on the basis of their preservation; concept of Form Genus. Introductory idea of correlation and stratigraphy; stratigraphic deductions based on plant fossils. Age of the earth, Geologic Time Scale, major events of plant life through geologic time. A detailed study of external, internal morphology and reproduction in the following fossils – Asteroxylon Mackiei, Lepidocarpon lomaxi, Lyginopteris oldhamia, Ginkgo biloba, and Cordaites.
6.	**Practicals:** **Pteridophytes:** Study of morphology, anatomy and reproductive structures of Psilotum, Lycopodium, Selaginella, Equisetum, Lygodium, Gleichenia, pteris, Ophioglossum, Isoetes, Ceratopteris Marsilea, **Gymnosperms:** Study of morphology, anatomy and reproductive structures of Cycas, Ginkgo, Cedurs, Araucaria,Podocarpus,Ephedra, Pinus, and Gnetum **Palaeobotany:** Study of important fossil forms from slides and specimens.

Suggested Readings:

1. Sporne, K.K. 1991. The Morphology of Pteridophytes. B.I. Publishing Pvt.Ltd. Bombay.
2. Sporne, K.R. 1974. Morphology of Gymnosperms. Hytchnson Univ. Library. London.

3. Vasishta, BR., A.K. Sinha, and Anil Kumar, 2005. Pteridophyta. S. Chand & co. Ltd. New Delhi.
4. Sambamurty, A. V. SS.2005. A Text book of Bryophytes, Pteridophytes, Gymnosperms and Paleobotany.I.K. International Pvt. Ltd. New Delhi.
5. Stewart, W.N. and Rathwell,G.W. 1993. Palaeobotany and the Evolution of Plants. Cambridge University press.
6. Bajaj, Y. PS. 1989. Biotechnology in Agriculture and Forestry. Trees. Vol. II. Springer Verlag. Berlin, Hiedelberg.