

Paper 4A

Developmental Biology, Ecology and Economic Zoology (Theory)

Marks: 75
Time: 3 Hours

- Unit-1:** Gametogenesis: Spermatogenesis and oogenesis; Fertilization; Partheno-genesis. Types of eggs; Cleavage and types of cleavage; Process of blastulation, fate map and Gastrulation in frog up to the formation of three germinal layers; Metamorphosis in insects and frog.
- Unit-2:** Ecology: Concepts, subdivisions, scope and importance; Levels of organization in the biosphere. Structure of ecosystem - Ecological factors (biotic and abiotic); Trophic structure: Food chains, food webs and energy flow; Trophic relationships – ecological pyramids. Productivity.
- Unit 3:** Ecological niche. Population: Growth and regulation. Concepts of biotic community. Inter and intraspecific interactions. Resources (renewable and non-renewable) and their management. Environmental pollution (air, water and soil).
- Unit 4:** Pisciculture: Culturable fish species of India; Culture and management of fish with reference to composite fish culture; Induced breeding.
Sericulture: Different species of silk moth; Life history of *Bombyx mori* and methods of culture; Product of sericulture and its economic importance.
- Unit 5:** Apiculture: Species of honey bees; Life history and social organization; Methods of bee keeping, economic importance.
Integrated pest management (physical, chemical, hormonal and biological).

Suggested Readings:

1. Ayyar, T. V. R. (1984). Handbook of Economic Entomology. International Books and Periodical Supply Service.
2. Balinsky, B. I. (1981). An Introduction to Embryology, 5th Edition. Saunders College Publishing, Holt-Saunders.
3. Beeby, A. and Brennan, M. A. (2008), First Ecology - Ecological Principles and Environmental Issues, 3rd Edition. Oxford University Press, India.
4. Cain, M. L., Bowman, W. D. and Hacker, S. D. (2011). Ecology, 2nd Edition. Sinauer Associates, Inc. Publishers.
5. Carlson, B. M. (2006). Foundations of Embryology. McGraw Hill Education (India) Ltd.
6. Gilbert, S. F. (2010). Developmental Biology, 9th Edition. Sinauer Associates, Inc. Publishers
7. Gupta, S. K. and Gupta, P. C. (2003). General and applied Ichthyology (Fish & Fisheries). S. Chand & Co.

