

SYLLABUS FOR
Ph.D./M.Phil
ELIGIBILITY ENTRANCE TEST 2013-2014

Zoology



RKDF UNIVERSITY, BHOPAL

Zoology syllabus for Ph.D./M.Phil Entrance Test

1. Non Chordates

1. General Characters and classification up to class level of all phylum of non – chordates
2. Plasmodium vivax – Life cycle & pathogenicity.
3. Sycon – General morphology, different types of cells
4. Obelia - Structure and Life History
5. Fasciola hepatica - Structure and Life cycle
Taenia solium – Structure and Life Style
Ascaris – Structure and Life Style
6. Leech – General Morphology, Digestive & Urinogenital system.
7. Prawn – Ext. Morphology, Digestive System, Respiratory System, Nervous System.
8. Star Fish – External Morphology & Water vascular system.
9. Hemichordata – General Characters & Affinities.

2. Chordates

1. General Characters & Classification
2. Urochordata – Concept of retrogressive metamorphosis
3. Scoliodon – Ext. Characters, Digestive System, Respiratory system, Structure of Heart, Ventral aorta, Urinogenital system, Brain & Spinal Cord.
4. Parental Care in Amphibia , Neoteny.
5. Flight adaptation in Birds, Migration of Birds
6. Rat – Ext. Characters, Digestive system, Respiratory System, Heart and Composition of Blood, Eye and Ear.

3. Cell Biology

1. Structure, Composition and functions of cell organelles – Plasma membrane, Endoplasmic reticulum, Golgi complex, lysosomes, Mitochondria, Nucleus, Chromosomes.
2. Cell Division – Mitosis and Meiosis.

4. Developmental Biology

1. Gametogenesis – Spermatogenesis & Oogenesis
2. Frog Embryology – Cleavage, Blastulation, gastrulation

3. Chick Embryology – Extraembryonic membranes in chick
4. Placentation in Mammals

5. Genetics

1. Mendel's Law's of inheritance
2. Interaction of genes – Complementary, Supplementary factors and duplicate genes
3. Multiples alleles and inheritance of ABO blood groups in man
4. Linkage and Corrosive over
5. Chromosomal methods of sex determination and Bridges ratio theory of genic balance
6. Sex linked inheritance in Man – Colour blindness, Haemophilia
7. Chromosomal mutation and gene mutation
8. Human Genetics – Syndromes – Turner, Klinefelter's and Down's syndrome. Inborn errors of metabolism – phenylketonuria, Alkaptonuria and Albinism
9. Structure of DNA & RNA

6. Evolution

1. Theories of organic evolution – Lamarck, Darwin and De Vries
2. Evidences of organic evolution – Anatomical, Palaeontological and embryological
3. Evolution of Man

7. Ecology

1. Ecosystem – Structure and functions
2. Population ecology – Characteristics – Density, Natality, Mortality, Age distribution.
3. Environmental Pollution – Sources and effects of water, air and soil pollution.
4. Energy resources – Conventional and non conventional energy resources.

8. Invertebrates: Structure and Function

1. Organization of coelom : Acoelomates, Pseudocoelomates, Protostomia and Deuterostomia
2. Locomotion : Flagellar and Cilary movement
3. Nutrition in Protozoa
4. Filter feeding in Polychaetes, Mollusca, and Echinodermata
5. Organs of Respiration : Gills, Lungs and trachea
6. Organs of Excretion : Coelom, Coelomoducts , Nephredia, and Malphigian tubules
7. Excretion and Osmoregulation in invertebrates

9 Vertebrates Structure and Function

1. Origin and Concepts of Protochordates, Affinities of Protochordates
2. Vertebrate integument and its derivatives
3. Blood Composition and function, Evolution of Heart, Evolution of Aortic
4. Arches, Single Circulation and Double Circulation
5. Internal and External respiration
6. Evolution of urinogenital system in Vertebrates
7. Comparative anatomy of Brain and spinal cord
8. Sense organ: Mechanoreceptors, Photoreceptors, Phonoreceptors.

10. Cell Biology

1. Membrane Structure and Function
2. Structural Organization of intracellular organelles :
3. Cell division and cell cycle
4. DNA replication repair and recombination
5. RNA synthesis and processing
6. Protein synthesis and processing

11. Genetics (Inheritance Biology)

1. Mendel's Law of inheritance
2. Interaction of Genes and Modifying Genes
3. Sex chromosomes and sex linked inheritance
4. Chromosomal methods of sex determination
5. Linkage and crossing over
6. Mutations
7. Multiple Alleles and inheritance

12. Human Genetics

- 1.Numerical abnormalities of human Chromosomes and related syndromes
- 2.Structural abnormalities of human Chromosomes and related syndromes
- 3.Human metabolic disorders

13.Genetic Engineering

- 1.Introduction to recombinant DNA technology
- 2.Enzymes used in DNA technology
- 3.Cloning vectors- Plasmids, Phages, Cosmids
- 4.Cloning techniques – Isolation and purification of genomics and plasmid DNA and RNA, Gel electrophoresis of nucleic acid
- 5.Gene transfer techniques – Electropotion and micro injection
- 6.Application of recombinant

14. Endocrinology :

- 1.Structure and Histology of Endocrine glands
- 2.Hormones of female reproductive physiology
- 3.Hormones of male reproductive physiology

15.Evolutionary Biology

- 1.Origin of Life
- 2.Theories of organic evolution
- 3.Hardy-weinberg genetic equilibrium
- 4.Genetic polymorphism

16.Environmental Biology:

- 1.Concepts and dynamics of ecosystem, components, food chain and energy flow
- 2.Biogeochemical cycles
- 3.Types of ecosystem
- 4.Population ecology
- 5.Community Structure and Organisation
- 6.Environmental Pollution

