

# UPSC Mains Zoology Optional Paper-I Syllabus

## 1. Non-chordata and Chordata:

- (a) Classification and relationship of various phyla up to subclasses: Acoelomate and Coelomate, Protostomes and Deuterostomes, Bilateria and Radiata; Status of Protista, Parazoa, Onychophora and Hemichordata; Symmetry.
- (b) Protozoa: Locomotion, nutrition, reproduction, sex; General features and life history of Paramecium, Monocystis. Plasmodium and Leishmania.
- (c) Porifera: Skeleton, canal system and reproduction.
- (d) Cnidaria: Polymorphism, defensive structures and their mechanism; coral reefs and their formation; metagenesis; general features and life history of Obelia and Aurelia.
- (e) Platyhelminthes: Parasitic adaptation; general features and life history of Fasciola and Taenia and their-Pathogenic symptoms.
- (f) Nematelminthes: General features, life history, parasitic adaptation of Ascaris and Wuchereria.
- (g) Annelida: Coelom and metamerism; modes of life in polychaetes; general features and life history of Nereis, earthworm and leach.
- (h) Arthropoda: Larval forms and parasitism in Crustacea; vision and respiration in arthropods (Prawn, cockroach and scorpion); modification. of mouth, parts in insects (cockroach, mosquito, housefly, honey bee and butterfly), metamorphosis in insect and its hormonal regulation, social behaviour of Apis and termites.
- (i) Molluscs: Feeding, respiration, locomotion, general features and life history of Lamellidens, Pila and Sepia. Torsion and detorsion in gastropods.
- (j) Echinodermata: Feeding, respiration, locomotion, larval forms, general features and life history of Asterias.
- (k) Protochordata: Origin of chordates; general features and life history of Branchiostoma and Herdmania.
- (l) Pisces: Respiration, locomotion and migration.
- (m) Amphibia: Origin of tetrapods, parental care, paedomorphosis.
- (n) Reptilia; Origin of reptiles, skull types, status of Sphenodon and crocodiles.
- (o) Aves: Origin of birds, flight adaptation, migration.
- (p) Mammalia: Origin of mammals, dentition, general features of egg-laying mammals, pouchedmammals, aquatic mammals and primates, endocrine glands (pituitary, thyroid, parathyroid, adrenal, pancreas, gonads) and their interrelationships.
- (q) Comparative functional anatomy of various systems of vertebrates. (integument and its derivatives, endoskeleton, locomotory organs, digestive system, respiratory system, circulatory system including heart and aortic arches, urinogenital system, brain and sense organs (eye and ear).

## 2. Ecology:

- (a) Biosphere: concept of biosphere; biomes, Biogeochemical cycles, Human induced changes in atmosphere including greenhouse effect, ecological succession, biomes and ecotones, community ecology.
- (b) Concept of ecosystem; structure and function of ecosystem, types of ecosystem, ecological succession, ecological adaptation.
- (c) Population; characteristics, population dynamics, population stabilization.
- (d) Biodiversity and diversity conservation of natural resources.
- (e) Wildlife of India.
- (f) Remote sensing for sustainable development.
- (g) Environmental biodegradation; pollution and its impact on biosphere and its prevention.

### **3. Ethology:**

- (a) Behaviour: Sensory filtering, responsiveness, sign stimuli, learning, and memory, instinct, habituation, conditioning, imprinting.
- (b) Role of hormones in drive; role of pheromones in alarm spreading; crypsis, predator detection, predator tactics, social hierarchies in primates, social organization in insects;
- (c) Orientation, navigation, homing; biological rhythms: biological clock, tidal, seasonal and circadian rhythms.
- (d) Methods of studying animal behaviour including sexual conflict, selfishness, kinship and altruism.

### **4. Economic Zoology:**

- (a) Apiculture, sericulture, lac culture, carp culture, pearl culture, prawn culture, vermiculture.
- (b) Major infectious and communicable diseases (malaria, filaria, tuberculosis, cholera and AIDS) their vectors, pathogens and prevention.
- (c) Cattle and livestock diseases, their pathogen (helminths) and vectors (ticks, mites, Tabanus, Stomoxys).
- (d) Pests of sugar cane (*Pyrrilla perpusiella*), oil seed (*Achaeajana*) and rice (*Sitophilus oryzae*).
- (e) Transgenic animals.
- (f) Medical biotechnology, human genetic disease and genetic counselling, gene therapy.
- (g) Forensic biotechnology.

### **5. Biostatistics:**

Designing of experiments; null hypothesis; correlation, regression, distribution and measure of central tendency, chi-square, student-test, F-test (one-way & two-way F-test).

## **6. Instrumentation methods:**

(a) Spectrophotometer, phase contrast and fluorescence microscopy, radioactive tracer, ultra centrifuge, gel. electrophoresis, PCR, ELISA, FISH and chromosome painting.

(b) Electron microscopy (TEM, SEM).

