

RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

SYLLABUS FOR COMPETITIVE EXAMINATION FOR THE POST OF ASSISTANT PROFESSOR IN ZOOLOGY FOR COLLEGE EDUCATION DEPARTMENT

PAPER-I

- 1 **Taxonomy:**
 - (a) Principles, rules and basis of Taxonomy and classification.
 - (b) Binomial system of nomenclature.
 - (c) General survey of animal kingdom, classification up to order and inter-relationship of the various phyla.

- 2 **Diversity of Life Forms:**

Structure and functions of the invertebrates (Protozoa to Echinodermata) and their economic importance.

 - (a) Levels of structural organizations- Unicellular, colonial and multicellular forms, Coelom, segmentation and metamerism.
 - (b) Locomotory organs and their mechanisms.
 - (c) Food, feeding and digestion.
 - (d) Respiration.
 - (e) Excretory and osmoregulatory organs.
 - (f) Primitive and advanced nervous systems.
 - (g) Reproduction: Asexual, sexual and parthenogenesis.
 - (h) Larval forms.

- 3 **Structural organization of Chordates:**
 - (a) Protochordates, Balanoglossus, Herdmania, Branchiostoma.
 - (b) Comparative anatomy of integument, skeletal, digestive, respiratory, circulatory, urinogenital & nervous systems of vertebrates.
 - (c) Adaptation in vertebrates (fishes, amphibians, reptiles, birds and mammals).
 - (d) Economic importance of chordates.

- 4 **Developmental Biology:**
 - (a) Gametogenesis.
 - (b) Fertilization.
 - (c) Early embryonic developments (Cleavage, Blastulation, Fate maps, Morphogenetic movements, Gastrulation).
 - (d) Organisers and Organogenesis.
 - (e) Development of Frog and Chick including Metamorphosis.
 - (f) Formation of extra embryonic membranes in Chick.
 - (g) Function and types of placenta in mammals, gestation and Parturition.
 - (h) Cell differentiation and teratogenesis.
 - (i) Sex differentiation in humans.

- 5 **Genetics:**
- (a) Mendelian laws of inheritance, recombination, linkage, linkage maps and crossing over, Multiple alleles, gene interaction.
 - (b) Mutation – Natural and induced mutations. Chromosome number and forms, structural rearrangements; Polyploidy.
 - (c) Cytoplasmic inheritance.
 - (d) Human genetics – normal and abnormal, pedigree analysis, karyotypes, genes and diseases, eugenics.
 - (e) Sex chromosomes and sex determination.
 - (f) Quantitative genetics- polygenic inheritance, heritability and its measurements, QTL mapping.
- 6 **Evolution:**
- (a) Origin of life; history of evolutionary thoughts.
 - (b) Lamarckism and Darwinism. Sources and nature of variations. Natural selection. Hardy-Weinberg law, Causes of speciation.
 - (c) Concept of species and sub-species.
 - (d) Fossils and their studies, outline of Geological eras. Origin and evolution of man.
 - (e) Principles and theories of continental distribution of animals.
 - (f) Zoogeographical realms of the world.
- 7 **Ethologys:**
- (a) Approaches and methods in study of behaviour.
 - (b) Proximate and ultimate causation, altruism and evolution-Group selection, kin selection, reciprocal altruism.
 - (c) Neural basis of learning, memory, cognition, sleep and arousal.
 - (d) Biological clocks, Development of behaviour, Social communication; Social dominance; Use of space and territoriality. Aggressive behaviour.
 - (e) Parental investment and Reproductive success; Parental care, Mating systems.
 - (f) Habitat selection and optimality in foraging; Migration, orientation and navigation; Domestication and behavioural changes.

Note :-

Pattern of Question Paper

1. **Objective type paper**
2. **Maximum Marks: 75**
3. **Number of Questions: 150**
4. **Duration of Paper: Three Hours**
5. **All Questions carry equal marks.**
6. **Medium of Competitive Exam: Bilingual English & Hindi**
7. **There will be Negative Marking.**