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.

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Note :- <u>Pattern of Question Paper</u>

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 in English & Hindi**
7. **There will be Negative Marking.**