

# RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

## SYLLABUS FOR SCREENING TEST FOR THE POST OF LECTURER IN ZOOLOGY FOR COLLEGE EDUCATION DEPARTMENT

### ZOOLOGY

- 1 **Taxonomy** – Principles and basis of classification, Binomial system of nomenclature. General survey of animal kingdom, classification upto order and relationship of the various phyla.
- 2 Study of structure and life cycle of following representations of various phyla.
  - (a) **Protozoa:** Paramecium, Monocystis, Plasmodium, Euglena, Trypanosoma and Leishmania, Protozoa and diseases. Locomotion and reproduction in protozoa.
  - (b) **Porifera:** Sycon, Canal system and skeleton in Porifera.
  - (c) **Coelenterata:** Obelia and Aurelia; polymorphism in Hydrozoa; coral formation; metagenesis.
  - (d) **Helminths:** Planaria, Fasciola and Taenia, Ascaris, Parasitic-adaptations and evolution of parasitism.
  - (e) **Annelida:** Nereis & Pheretema, Hirudo.
  - (f) **Arthropoda:** Palaemon, Palamnaeus, Limulus, Periplanata, Musca and Anopheles, Larval Forms and parasitism in Crustacea. Mouth parts, vision and respiration in arthropods; social life and metamorphosis in insects.
  - (g) **Mollusca:** Unio, Pila and Sepia.
  - (h) **Echinodermata:** Starfish. Larval forms of Echinodermata. Phylogenetic relationships between invertebrate larvae.
- 3 Structural organization of the following chordate types-Balanoglossus, Herdmania, Branchiostoma, Scoliodon, wallago, Rana, Varanus, Columba Rabbit.
- 4 Comparative account of the integument, skeletal, circulatory, urinogenital & nervous systems of vertebrates.
- 5 Retrogressive metamorphosis, Paedogenesis; adaptations of snakes; adaptation of birds; Adaptation of mammals. Poisonous and non-poisonous snakes of India.
- 6 Economic importance of non-chordates and chordates.
- 7 **Cell Biology:** Types of microscopes, structure, functions and applications. Structure and function of cell and cytoplasmic constituents: structure of nucleus. Plasma membrane, mitochondria, Golgi bodies, endoplasmic reticulum, lysosomes and ribosomes. Cell division.
- 8 **Gene structure and function:** Watson & Crick model of DNA: replication of DNA. Genetic code: Protein synthesis, sex chromosomes and sex determination.
- 9 Genetics: Mendelian laws of inheritance, recombination, linkage, linkage maps and crossing over. Multiple alleles; Mutation – Natural and induced mutations. Chromosome number and forms, structural rearrangements; polyploidy; Cytoplasmic inheritance. Elements of human genetics – normal and abnormal karyotypes; genes and diseases, eugenics.
- 10 **Biotechnology-** definition, scope, recombinant DNA technology, PCR, DNA finger printing, transgenic animals, blotting techniques, patenting laws and animals cloning.

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- 11 **Physiology:** chemistry of carbohydrates, proteins, lipids and nucleic acids, enzymes and hormones, biological oxidation, carbohydrate, protein and lipid metabolism; digestion and absorption; respiration; structure and circulation of blood. Structure and function of heart; cardiac cycle, chemical regulation of the heart beat, physiology of excretion physiology of muscular contraction. Nerve impulse- Origin and transmission. Function of sensory organs concerned with vision, sound perception, taste, smell and touch, physiology of reproduction. An elementary idea of immunology.
- 12 **Evolution:** Origin of life; history of evolutionary thoughts; Lamarkism and Darwinism, Sources and nature of variations; natural selection. Hardy-Weinberg law; cryptic and warning colouration, mimicry; isolation, island life. Concept of species and sub-species. Fossils; outline of geological eras. Origin and evolution of man. Principles and theories of continental distribution of animals. Zoogeographical realms of the world.
- 13 **Developmental Biology:** Gametogenesis, Fertilization, types of eggs and cleavage. Development in Branchiostoma, frog and chick upto gastrulation. Fate maps of frog and chick, metamorphosis in frog; formation and fate of extra embryonic membranes in chick; function and types of placenta in mammals, organisers. Regeneration Genetic control of development; Organogenesis of central nervous system, heart and kidney of vertebrate embryos. Teratogenesis, ageing and tissue culture, cell differentiation and apoptosis.
- 14 **Techniques in Biology** – Electrophoresis, centrifugation, chromatography, colorimetry spectrophotometry, immunological techniques, ELISA.
- 15 **Statistical application in Biology** – mean, median, mode, students "t" test, chi-square test, correlation and regression, variance and analysis of variance, standard deviation, computer applications in biology – fundamentals of computers, history and generations.
- 16 **Animal Ecology:** Population; interspecific and interaspecific relationships, competition, predation, parasitism, commensalism, co-operation and mutualism. Community ecology and succession; concept of ecosystem; Biogeochemical cycles. Limiting factors; concepts of habitat and ecological niche; Major biomes and their communities; pollution - its control and management.
- 17 **Wild life studies:** Biodiversity, conservation and major wild life sanctuaries in Rajasthan.

Note :- Pattern of Question Paper

1. Objective type paper
2. Maximum Marks : 100
3. Number of Questions : 100
4. Duration of Paper : Two Hours
5. All questions carry equal marks.
6. There will be Negative Marking.