

**Zoology Answer writing
Practice Squad -1 (TOPIC-
PHYSIOLOGY ,SUB-TOPIC-
ENDOCRINOLOGY)**

PAPER-2-ZOOLOGY

TOPIC- PHYSIOLOGY

SUB-TOPIC- ENDOCRINOLOGY

**SYLLABUS – Hormone classification
(steroid and peptide hormones),
biosynthesis and functions.**

. QUESTIONS -

- 1. DESCRIBE THE TWO CHEMICAL CLASSES OF HORMONES BASED ON THEIR SOLUBILITY?**
- 2. HOW ARE HORMONES TRANSPORTED IN THE BLOOD?**
- 3. DESCRIBE THE GENERAL MECHANISMS OF HORMONE ACTION? AND HOW DO THEY AFFECT CELLULAR ACTIVITY?**

WHAT SIGNALS CONTROL HORMONE

4. **SECRETION? DESCRIBE THE MECHANISM OF CONTROL OF HORMONE ACTION?**
 5. **ELABORATE THE BIOSYNTHESIS PROCESS OF HORMONES?**
-

ZOOLOGY OPTIONAL PAPER APPROACH FROM DESIRE IAS

OPTIONAL PAPER – ZOOLOGY

PAPER-1

It include-

1. NON CHORDATE AND CHORDATE ZOOLOGY-

Can be divided into 3 sections-

1. NONCHORDATES ZOOLOGY– It comprises following topics:-

- 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.
- Protozoa: Locomotion, nutrition, reproduction, sex; General features and life history of Paramecium,

Monocystis, Plasmodium and Leishmania.

- Porifera: Skeleton, canal system and reproduction.
- Cnidaria: Polymorphism, defensive structures and their mechanism; coral reefs and their formation; metagenesis; general features and life history of Obelia and Aurelia.
- Platyhelminthes: Parasitic adaptation; general features and life history of Fasciola and Taenia and their pathogenic symptoms.
- Nematelminthes: General features, life history, parasitic adaptation of Ascaris and Wuchereria.
- Annelida: Coelom and metamerism; modes of life in polychaetes; general features and life history of Nereis, earthworm and leach.
- 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.
- Mollusca: Feeding, respiration, locomotion, general features and life history of Lamellidens, Pila and Sepia, torsion and detorsion in gastropods.
- Echinodermata: Feeding, respiration, locomotion, larval forms, general features and life history of Asterias.

1. **CHORDATE ZOOLOGY**– It contains:-

- Protochordata: Origin of chordates; general features and life history of Branchiostoma and Herdmania.
- Pisces: Respiration, locomotion and migration.
- Amphibia: Origin of tetrapods, parental care, paedomorphosis.
- Reptilia; Origin of reptiles, skull types, status of Sphenodon and crocodiles.
- Aves: Origin of birds, flight adaptation, migration.
- Mammalia: Origin of mammals, dentition, general features of egg laying mammals, pouched-mammals, aquatic mammals

and primates, endocrine glands (pituitary, thyroid, parathyroid, adrenal, pancreas, gonads) and their interrelationships.

1. **COMPARATIVE ANATOMY**– It includes-

- 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, urino-genital system, brain and sense organs (eye and ear).

2. **ECOLOGY**-

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

3. **ETHOLOGY**-

- Behaviour: Sensory filtering, responsiveness, sign stimuli, learning and memory, instinct, habituation, conditioning, imprinting.
- Role of hormones in drive; role of pheromones in alarm spreading; crypsis, predator detection, predator tactics, social hierarchies in primates, social

organization in insects.

- Orientation, navigation, homing, biological rhythms, biological clock, tidal, seasonal and circadian rhythms.
- Methods of studying animal behaviour including sexual conflict, selfishness, kinship and altruism.

4. ECONOMIC ZOOLOGY-

- Apiculture, sericulture, lac culture, carp culture, pearl culture, prawn culture, vermiculture.
- Major infectious and communicable diseases (malaria, filaria, tuberculosis, cholera and AIDS) their vectors, pathogens and prevention.
- Cattle and livestock diseases, their pathogen (helminthes) and vectors (ticks, mites, Tabanus, Stomoxys).
- Pests of sugar cane (*Pyrilla perpusiella*) oil seed (*Achaea janata*) and rice (*Sitophilus oryzae*).
- Transgenic animals.
- Medical biotechnology, human genetic disease and genetic counselling, gene therapy.
- 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-

- Spectrophotometer, phase contrast and fluorescence microscopy, radioactive tracer, ultracentrifuge, gel electrophoresis, PCR, ELISA, FISH and chromosome painting.
- Electron microscopy (TEM, SEM).

PAPER-2

1. CELL BIOLOGY

Can be divided into 3 sections:-

1. STRUCTURE AND FUNCTION

- Structure and function of cell and its organelles (nucleus, plasma membrane, mitochondria, Golgi bodies, endoplasmic reticulum, ribosomes, and lysosomes), chromosome type polytene and lambrush, organization of chromatin, heterochromatin,

1. CELL DIVISION, CELL DEATH, CELL SIGNALLING

- cell division (mitosis and meiosis), mitotic spindle and mitotic apparatus, chromosome movements, Cell cycle regulation, Cancer cells, Signal molecules, defects in signaling pathway and consequences and cell death (PICKED UP FROM GENETICS AND DEVELOPMENTAL BIOLOGY RESPECTIVELY)

1. MOLECULAR BIOLOGY

- Nucleic acid topology, DNA motif, DNA replication, transcription, RNA processing, translation, protein foldings and transport.
- Gene regulation and expression in prokaryotes and eukaryotes (PICKED UP FROM GENETICS)

2. GENETICS

Can be divided into 3 sections:-

1. CLASSICAL GENETICS

- Mendel's laws of inheritance, recombination, linkage, multiple alleles, genetics of blood groups

1. MODERN GENETICS

- Modern concept of gene, split gene, genetic regulation, genetic code.
- Sex chromosomes and their evolution, sex determination in *Drosophila* and man.
- pedigree analysis, hereditary diseases in man.
- Mutations and mutagenesis.

1. BIOTECHNOLOGY AND ITS APPLICATIONS

- Recombinant DNA technology; plasmid, cosmid, artificial chromosomes as vectors, transgenic, DNA cloning and whole animal cloning (principles and methods).
- RFLP, RAPD and AFLP and application of RFLP in DNA finger printing, ribozyme technologies, human genome project, genomics and proteomics.

3. EVOLUTION

- Theories of origin of life.
- Theories of evolution; Natural selection, role of mutations in evolution, evolutionary patterns, molecular drive, mimicry, variation, isolation and speciation.
- Evolution of horse, elephant and man using fossil data.
- Hardy-Weinberg Law.
- Continental drift and distribution of animals.

4. SYSTEMATICS-

- Zoological nomenclature, international code, cladistics, molecular taxonomy and biodiversity

5. BIOCHEMISTRY (MOST IMP AND MARK FETCHING TOPIC)

6. BIOMOLECULES

- Structure and role of carbohydrates, fats, fatty acids and cholesterol, proteins and amino-acids, nucleic acids. Bioenergetics.
- Enzymes: types and mechanisms of action.
- Vitamins and co-enzymes

1. METABOLISM

- Glycolysis and Krebs cycle, oxidation and reduction, oxidative phosphorylation, energy conservation and release, ATP cycle, cyclic AMP – its structure and role.

1. IMMUNOLOGY

- Immunoglobulin and immunity.

6. PHYSIOLOGY (with reference to mammals)

7. CIRCULATORY SYSTEM AND BLOOD-

- Composition and constituents of blood; blood groups and Rh factor in man, factors and mechanism of coagulation, iron metabolism, acid-base balance, thermo-regulation, anticoagulants.
- Haemoglobin: Composition, types and role in transport of oxygen and carbon dioxide.

1. DIGESTION AND ABSORPTION

- Role of salivary glands, liver, pancreas and intestinal glands.

1. EXCRETORY SYSTEM

- nephron and regulation of urine formation; osmo-regulation and excretory product

1. MUSCULAR SYSTEM

Types, mechanism of contraction of skeletal muscles, effects of exercise on muscles.

1. NERVOUS SYSTEM

- nerve impulse – its conduction and synaptic transmission, neurotransmitters.

1. SENSE ORGANS

- Vision, hearing and olfaction in man.

1. **ENDOCRINOLOGY-**

- Hormone classification (steroid and peptide hormones), biosynthesis and functions.(PICKED UP FROM BIOCHEMISTRY)

1. **REPRODUCTIVE SYSTEM-**

- Physiology of reproduction, puberty and menopause in human,
- **in vitro fertilization and embryo transfer, cloning.**(PICKED UP FROM DEVELOPMENTAL BIOLOGY)

7. **DEVELOPMENTAL BIOLOGY-**

8. **GAMETOGENESIS-BLASTOGENESIS**

- Gametogenesis; spermatogenesis, composition of semen, in vitro and in vivo capacitation of mammalian sperm, Oogenesis, fertilization, blastogenesis, establishment of body axes formation, fate map, gastrulation in frog and chick;

1. **GENETIC DEVELOPMENT, METAMORPHOSIS AND AGING-**

- genes in development in chick, homeotic genes, development of eye and heart,
- Genetic and induced teratogenesis, role of thyroxine in control of metamorphosis in amphibia, paedogenesis and neoteny , aging.
- Developmental genes in man

1. **STEM CELLS, MORPHOGENESIS, PLACENTA AND BIOGENETIC LAWS**

- Stem cells: Sources, types and their use in human welfare. Totipotency.
- Biogenetic law.
- placenta in mammals.
- morphogenesis and morphogen.

WHY THERE IS CLASSIFICATION OF DIFFERENT TOPICS INTO VARIOUS SUB TOPICS?

- For easy conceptual understanding and getting a clarified idea to deal with.
- To avoid mingling of multiple topics together.
- To isolate each topic to other avoiding hesitancy.

HOW TO MAKE NOTES?

- First go thoroughly with the syllabus.
- Understand what is in it (because ZOOLOGY is a bulky subject)
- Overlook on previous year question.
- Analyse it that to which topic it belongs and to what depth UPSC frame questions.
- Read the topic atleast 2 times for conceptual clearance.
- Then write notes.
- Diagram is essence of zoology.
- Ultimate is REVISE, REVISE AND REVISE.

Though voluminous syllabus, it is easy to score high in this!!

Keep learning!!

All the best!!