SYLLABUS FOR SUBSIDIARY ZOOLOGY (SZO)

PAPER - I : Theory (100 marks)

Block I : Nonchordate, Parasitology and Immunology

Unit-1 : Classification

Classification of subphylum protozoa, phylum porifera, annelida, arthropoda, mollusca and echinodermata upto orders with suitable examples.

Unit-2 : Type Study

1. *Paramoecium* : General organization, locomotion, nutrition and reproduction.
2. *Scypha* : General organization, canal system, types of cells and spicules, reproductive system.
3. *Pheritima* : General organization, metamarism, circulation, locomotion, excretion, reproduction.
4. *Periplanata* : General organization, respiratory, excretory, circulatory, reproductive and nervous system.

Unit-3 : Type Study

1. *Pila* : General organization, respiratory, excretory, nervous system.
2. *Starfish* : General organization, water vascular system and larval forms.
3. *Balanoglossus* : General organization, structure of pharynx, reproductive system and larval forms.

Unit-4 : Parasitology and Immunology

1. Parasitism, symbiosis, commensalism and mutualism.
2. Life history and pathogenecity of *Entamoeba histolytica, Plasmodium vivax, Ascaris lumbricoides, Anchylostoma duadenale, Fasciola hepatica, Echinococcus granulosus.*
3. Antigen-Antibody : Definition and concept, types of cells involved in the body immune system, antigen-antibody reaction (outline idea), basic principal of vaccination.

Block II : Chordates and Comparative Anatomy

Unit-1 : Classification

1. Classification of the phylum chordata with characters and examples. Classification upto order of amphibia, reptilia and mammalia and upto subclass of pisces and aves.

Unit-2: Type Study

1. *Branchiostoma* – Feeding, digestion, circulation and excretion.
2. Fishes – General organization, structure and function of gill and respiration, accessory respiratory organs, differences of bony fishes, circulation in *channa*.

Unit-3: Type Study

1. Toad : General organization, circulation, respiration, urinogenital, nervous and skeletal system.
2. Calotes : General organization, digestion, circulation, respiration, genital and nervous system.
3. Columba : Feathers, digestion, respiration.

Unit-4: Comparative Anatomy

1. Comparative anatomy of heart and brain in vertebrates.
2. Comparative of dentition and stomach in mammals.

PAPER-II : Theory (100 marks)

Block I : Taxonomy, Developmental Biology, Cytogenetics, Molecular Biology, Histophysiology and Biochemistry

Unit-1: Taxonomy and Developmental Biology

1. Definition of taxonomy and systematics, principal of nomenclature, levels of taxonomy, concept of species.
2. Structure of sperm and ovum, spermatogenesis, oogenesis, outline idea of fertilization.
3. Cleavage and gastrulation of amphioxus and frog.
4. Foetal membrane in chick, placenta in rabbit.

Unit-2: Cytogenetics and Molecular Biology

1. Plasma membrane: Structure, molecular architecture and function.
2. Mitochondria: Structure and function.
3. Structure of chromosome (nucleosome model)
4. Structure of DNA and RNA; DNA as a genetic material.
5. Sex determination of *Drosophila* and Man.
6. Autosomal inheritance-thalassemia.
7. Mutation-definition, types.

Unit-3: Histophysiology and Biochemistry

1. Histophysiology of pituitary and thyroid gland and their hormones (in mammals).
2. Physiology of nerve impulses; synaptic transmission.
3. Role of haemoglobin in respiration.
4. Blood group, ABO, Rh factor.

Block II : Ecology, Environmental Biology, Evolution, Adaptation and Ethology

Unit-1: Ecology and Environmental Biology

1. Ecosystem : Concept, food chain, food web, ecological pyramid, energy flow (box-pipe model).
2. Population ecology: Properties, growth forms and regulation.
3. Concept of biodiversity and bio indicator.
4. Air, water and noise pollution.
5. Principals of wild life conservation.

Unit-2: Evolution, Adaptation, Distribution and Ethology

1. Darwinian concept and synthetic theory.
2. Hardy-Weinberg equilibrium and its application.
3. Aquatic and desert adaptation.
4. Zoogeographical realms.
5. Distribution of felidae in India.
6. Pheromones and animal behaviors.
7. Social behaviour of honey bee.

PAPER-III : Practical (100 marks)

Block I : Dissection on Chordates and non-chordates

Unit-1: Digestive, nervous and reproductive system of *periplanata* and earthworm.

Unit-2: IXth and Xth cranial nerves of *Channa*. Urinogenital system of *Oreochromis*.

Unit-3: Identification of Chordatos Non-chordates.

Unit-4: Identification with reasons : Limb bones of toad, pigeon, guineapig, vertebrae

of toad, pigeon, guineapig. Skull of toad, pigeon, guineapig, poisonous and non poisonous snake.

Unit-5: Mounting of Preparation— (a) Mouth parts of Cockroach, (b) Setae of earthworm (c) Cycloid, ctenoid of placoid scales, (d) Mounting of mosquito larva.

Block II : Ecology, Embryology, Endocrinology and Cytogenetics

Unit-1: Concept and determination of common water quality—Dissolved oxygen, Productivity and alkalinity.

Unit-2: Whole mount preparation of chick embryo (24hr, 48hr, 72h, 96h).

Unit-3: Staining, mounting and identification of prepared sections of liver, pancreas, thyroid, testes, ovary and adrenal— drawing and labeling.

Unit-4: Meiotic chromosome study of grasshopper— from testes squash preparation.

Unit-5: Differential count of human blood.

Suggested Readings:

1. **Biology of Animals : Sinha, Adhikary and Ganguly (Vol. I & II & III)**
2. ত্রি-বার্ষিক প্রাণীবিদ্যা ঃ ড. অসীম কুমার চট্টোপাধ্যায়, ডঃ চন্দ্রশেখর চক্রবর্ত্তী (নির্মলা লাইব্রেরী)
3. স্নাতক প্রাণীবিদ্যা ঃ ড. দেবজ্যোতি চট্টোপাধ্যায় (বুক সিন্ডিকেট প্রাঃ লিঃ)
4. ত্রি-বার্ষিক প্রাণীবিদ্যা ঃ ড. সমীর বন্দ্যোপাধ্যায়, ড. পার্থপ্রতিম বিশ্বাস (ওরিয়েন্টাল বুক কো. প্রা. লি.)
5. ব্যবহারিক প্রাণীবিদ্যা ঃ ঘোষ ও মান্না।