

Vidyasagar Evening College
Lesson Plan of Zoology (General): 2017-2018

PART-I

PAPER-I

FULL MARKS-100

Before Mid-Term

Teacher-DB:

Group-A(ZG-01)Functional Anatomy of Non-Chordates// **No. of Lectures: 07.**

1. Classification of sub-kingdom Protozoa upto Phylum (Levine et al, 1980) and Phylum Porifera, Cnidaria, Platyhelminthis, Annelida, Arthropoda, Mollusca and Echinodermata up to Class (Rupert Barnes,1994)
2. General structure & function of the following:
 - I) Feeding & digestion (a)Microphagy (Amoeba)
 - VII) Reproduction: a) Fission (Amoeba) (b) Budding (Hydra) (c)Conjugation (Paramoecium, (e) Metagenesis in Obelia (in Brief)

Teacher-PC:

Group –B: (ZG-02) Cell Biology, Genetics and Molecular Biology// **No. of Lectures: 12.**

1. Fluid mosaic model of plasma membrane
2. Cell cycle: check points
3. Physio chemical properties, types, structures (in brief) and functions of DNA and RNA.

Group-C(ZG-03). Developmental Biology // **No. of Lectures: 20.**

1. Spermatogenesis and Oogenesis
2. Fertilization in sea urchin
5. Extra embryonic membranes in chick
6. Placenta :types and function

After Mid-Term

Teacher-DB

Paper I:

Group-A:Functional Anatomy of Non-Chordates// **No. of Lectures :24.**

2. General structure & function of the following with reference to the specimens mentioned:
 - II) Feeding & digestion :Macrophagy(Periplanata)
 - III) Respiration (a) Respiratory pigments (Hemoglobin & hemocyanin, (b) Ctenidium & pulmonary sac (Pila), gills, Traechea and booklung (prawn, cockroach, scorpion)
 - IV) Excretion (a) Flame cells (Taenia), b) Nephridia (Earthworm), Malpighian tubules (Cockroach), Green gland (Prawn)
 - V) Circulation (a) Open circulation (Cockroach, (b) Closed circulation (Earth worm)
 - VI) Neural Integration : Integration –simple & complex nerve nets, (b) Nervous system, (Cockroach, Apple snail)
 - VII) Reproduction : (d) Sexual (Cockroach)

Teacher-PC**PAPER-I: Theory**

Group-C. Developmental Biology// **No. of Lectures:10.**

3. Types of eggs & cleavages; process of cleavage in Amphioxus
4. Gastrulation in Amphioxus

Teacher -PC

Group –B: Cell Biology, Genetics and Molecular Biology// **No. of Lectures :23.**

4. DNA as a genetic material
5. Mechanism of replication, transcription and translation in E.coli
6. Linkage and recombination
7. Modes of inheritance of autosomal and sex linked genes in man (Thalassemia & Haemophilia, colour blindness)
8. Sex determination in Drosophila

Paper III (ZG-07). Laboratory Course Work// **No. of Lectures :17.**

Teacher-PC**(Before Mid-term)**

2. Mounting and preparation
 - i) Mouth parts of cockroach
 - iii) Haemolymph of cockroach
- 3.ii) Identification with reasons :
 - c. Non-chordate specimens : Paramoecium, Scypha, Obelia, Sea-anaemone, Ascaris(male and female), Hirudinaria, Scorpion, Bombyx mori (adult male and female),Lamellidens,Pila, Loligo, Starfish, Balanoglossus.

Practical: (After Mid-Term)**Teacher- PC :**

Paper III. Laboratory Course Work// **No. of Lectures :18.**

1. Dissection
 - i) Cockroach : Digestive system, nervous system
2. Mounting and preparation
 - iv) Gut contents of cockroach for Protozoa
 - v) Whole mount of aquatic and soil microarthropods
 - vi) Epithelial cells from buccal smear with stainingl

PART-II

Theory:(Before Mid-Term)

Teacher-DB:

Paper II: Theory

Group A :Functional Anatomy of Chordates// No. of Lectures :5.

1. Classification of Phylum Chordata with distinctive features and suitable examples –upto living subclass (Amphibia, Reptilia and Mammalia); upto subclass (Fishes and Aves) (Scheme of classification as per J.Z. Young 1980, Life of vertebrates)

Teacher-PC:

Paper II: Theory// **No. of Lectures :18.**

Group-C:Histology, Endocrinology, Animal Physiology & Biochemistry

1. General characters of hormones: Naming and function of hormones secreted from Pituitary
2. Histology of Pancreas
3. Enzyme: classification, charac, mechanism, effect of ph and temp

Teacher-DB:

Group B. Ecology, Animal Behavior, Biodiversity and Wildlife// **No. of Lectures :17.**

1. Population- definition and growth
2. Community- definition and types
3. Basic concept of biodiversity, biodiversity hot spots
4. Honey bee- Hive, castes and their roles

Theory: (After Mid-Term)

Teacher- DB:

Paper II: Theory

Group A :Functional Anatomy of Chordates// **No. of Lectures :30.**

2. Functional anatomy: digestive Oreochromis, circulatory Columba
3. Structure & function of the followings
 - i) Integument : general structure and function, scales in fishes and feathers of Columba
 - ii) Pharynx (Branchiostoma); stomach (Bos)
 - iii) Respiratory structures and Respiration : Gill (Fish), accessory respiratory organs (Fish); lung and air sac (Columba)
 - iv) Circulatory structure and circulation: Single circuit heart (fish); double circuit heart (Amphibia and Mammals)
 - vi) Nervous system- Brain in Oreochromis,
 - vii) Origin and distribution of cranial nerves (in fish).

Teacher-PC

Group-C: Histology, Endocrinology, Animal Physiology & Biochemistry // **No. of Lectures :12**

4. Physiology of nerve impulse & synaptic transmission (in brief)
5. Osmoconformers and Osmoregulators; Osmoregulation in fishes

Teacher-DB:

Paper II: Theory

Group B. Ecology, Animal Behavior, Biodiversity and Wildlife// **No. of Lectures :20.**

5. Conservation of wild life- purpose & methods, concept of Biosphere Reserve, importance & strategies of wildlife conservation, National park & Wildlife Sanctuary
6. Basic idea of ecotoxicology and xenobiotics, concept of EIA.
7. Climate change: global warming, acid rain, ozone depletion

Paper III. Laboratory Course Work/ **No. of Lectures :27.**

Teacher-DB:

1. Demonstration

- i) Cockroach-digestive, nervous, female reproductive system
- iii) Oreochromis : digestive and urino-genital system.

2. Mounting and preparation

- i) Mouth parts of cockroach
- ii) Cycloid and ctenoid scale of fin fish
- iii) Haemolymph of cockroach
- iv) Gut contents of cockroach for protozoa
- v) Whole mounts of aquatic and soil microarthropods
- vi) epithelial cells from buccal smear with staining

3.ii) Identification with reasons :

- a. Bones: Skull, vertebrae, limb and girdle bones of Columba & Cavia
- b. Histological slides : Sections of mammalian liver, pancreas, testis, ovary, kidney, thyroid.
- c. Non-chordate specimens : Plasmodium vivax, Paramoecium, Scypha, Obelia, Sea-anemone, Ascaris, Hirudinaria, Scorpion, Bombyx mori, Lamellidens, Achatina, Loligo, Starfish, Balanoglossus.
- d. Chordate specimens : Branchiostoma, Petromyzon, Scolidon, Lates, Rhacophorous, Axolotl larva, Tylototriton, Gekko; Hemidactylus, Turtle, Naja, Chiroptera.

4. Report on field study tours: Zoological garden and Museum.

5. Viva –voce discussion.

PART-III

PAPER-IV

Theory:(Before Mid-Term)

Teacher-DB

Group A: Applied Zoology// **No. of Lectures :30.**

1. Sericulture: characteristics of sericulture industry and its scope; types of silk moths/ worms, (scientific names), host plants and improvement and their variety. Life history and rearing of Bombyx mori, harvesting & processing of cocoon, reeling and extraction of silk, pest on mulberry plants and diseases of worms of Bombyx mori and control measures. Research & development of sericulture in India.
2. Aquaculture : Principles, definition and scope. Fisheries resources of India (inland & off-shore) and their important ichthyofauna. Exotic fishes- their merits and demerits. Fish breeding and their

application. Basic principles of different aquaculture system (Polyculture and integrated farming); marine pearl culture, culture of prawn and shrimps.

3. Pest and Management :

a) Definition and types of pests with examples. Life history, behaviour, ecology, damage and control of the following pests : i) Paddy Scirpophaga (Syn. Tryporyza) incertulas, ii) Stores grain-Sitophilus oryzae, iii) Termite, iv) Mammalian pest (Bandicota bengalensis).

b) Integrated Pest Management 4. Apiculture : Development of Apiary in India. Types of honey bees, modern methods of apiary management, products and its uses. Problems and prospects.

5. Lac culture: Lac insect (Scientific name). Composition of Lac. Strains of lac insects, cultivation of lac, lac host plants (name only), Processing of lac and uses.

6. Poultry: Duck and fowl - Types of breeds, rearing and disease management.

Teacher- PC:

Paper IV

Group –C. Evolutionary Biology// **No. of Lectures :20.**

1. Definition of systematics & taxonomy
2. Species as a unit of evolution (definition and types: biological, sibling and polytypic species)
3. Chemical basis of origin of life.
4. Anatomical and Physiological adaptations : Aquatic, Desert and Volant animals.
5. Zoogeographical realms & their subdivisions with characteristic fauna.

Theory: (After Mid-Term)

Teacher- PC:

Paper IV

Gr. B. Parasitology & Immunology// **No. of Lectures :20.**

1. Parasitism (definition and types) and other interspecific (symbiosis, commensalism and mutualism) interactions.
2. Life history, Pathogenicity and clinical features of (i) Entamoeba histolytica, (ii) Plasmodium vivax, (iii) P. falciparum, (iv) Ascaris, (v) Fasciola hepatica.
3. Outline structure and classification of immunoglobulin, antigen-antibody reaction, basic principle of vaccination..

Practical:(Before Mid-Term)

Teacher-PC:

Group –D. Laboratory course work// **No. of Lectures :12.**

1. Experimental works :
2. Pedigree analysis : sex linked recessive, autosomal recessive and dominant
3. Identification:

Microfilaria of Wuchereria bancrofti, Taenia solium, Scirpophaga (Syn. Tryporyza) incertulas, Sitophilus oryzae, , Leptocorisa, Epilachna, Coccinella, Lepisma, Termite, Bandicota bengalensis, Labeo rohita, L. bata, Catla catla, Cirrhinus mrigala, Hypophthalmichthyes molitrix, Cyprinus carpio, Ctenopharyngodon idellus, Tenuialosa (Hilsa) ilisha, Penaeus sp, Macrobrachium rosenbergi.

Practical:(After Mid-Term)

Teacher-PC:

1. Experimental works :// No. of Lectures :18.

- a. Estimation of dissolved O₂ content of water
or Estimation of dissolved free CO₂ content of water**
- c. Determinant of ABO blood group & Rh factor in man**

2. Field training :

ii) Poultry farm

v) Place of wild life interest (Sanctuary, National Park, Biosphere Reserve etc.)

Viva –voce discussion.