

Teaching Plan: 2016-2017

Department of Zoology, Vidyasagar Evening College

Faculty: Parbati Chatterjee and New Faculty.

1st. yr:

Theory:(Before Mid-Term)

PC:

Paper I: Theory

Group-C. Developmental Biology // No. of Lectures:18.

- 1.Spermatogenesis and Oogenesis
- 2.Fertilization in sea urchin
- 5.Extra-embryonic membranes in chick
- 6.Placenta types and function
- 8.Concept of Protostomia & Deuterostomia with reference to metazoan origin

NF:

Paper I: Theory

Group-A:Functional Anatomy of Non-Chordates// No. of Lectures :07.

- 1.Classification with distinctive features and suitable examples of sub-kingdom Protozoa (upto Phylum) (Levine et al, 1980) and Phylum Porifera, Cnidaria, Platyhelminthis, Annelida, Arthropoda, Mollusca and Echinodermata (up to Class)

Group –B:Cell Biology, Genetics and Molecular Biology// No. of Lectures :18.

1. Ultrastructure & function of plasma membrane, GERL system, ribosome, lysosome
2. Chromosome structure, nucleosome concept
4. Physio chemical properties, types, structures (in brief) and functions of DNA and RNA.
5. Nucleic acids as genetic material.
6. Mechanisms of replication and transcription in E. coli
9. Chromosomal aberrations-in number and structures, point mutation, Down syndrome & Klinefelter syndrome

Theory:(After Mid-Term)

PC:

Paper I: Theory

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 (a)Microphagy (Amoeba), Macrophagy (Periplanata)
 - III) Respiration (a) Respiratory pigments (Hemoglobin & hemocyanin, (b) Ctenidium & pulmonary sac (Pila), gills, Trachea 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 : a) Fission (Amoeba) (b) Budding (Hydra) (c) Conjugation (Paramecium), (d) Sexual (Cockroach), (e) Metagenesis in Obelia (in Brief)

Group-C. Developmental Biology// No. of Lectures:12.

3. Types of eggs & cleavages; process of cleavage in frog and chick
4. Gastrulation in frog and chick
7. Organizer concept

NF:

Paper I: Theory

Group-A:Functional Anatomy of Non-Chordates// No. of Lectures :04.

2. General structure & function of the following with reference to the specimens mentioned:

1) Locomotion (a) Microfibrils (Amoeba), (b) Flagella (Euglena), (c) Cilia (Paramecium)

Group –B:Cell Biology, Genetics and Molecular Biology// No. of Lectures :17.

3. Cell cycle, oncogene & cancer (basic idea)

6.Translation in E.coli.

7. Modes of inheritance of autosomal and sex linked genes in man (Thalassemia & Haemophilia, colour blindness)

8. Linkage and recombination

10. Sex determination in Drosophila and man

11. Basic concept of genetic engineering & gene cloning, and gene manipulation

Practical:(Before Mid-Term)

PC:

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

2. Mounting and preparation

ii) Radula of Pila

iii) Osphradium of Pila

3.ii) Identification with reasons :

c. Non-chordate specimens : Plasmodium vivax, Paramecium, Scypha, Obelia, Sea-anemone, Ascaris, Hirudinaria, Scorpion, Bombyx mori, Lamellidens, Achatina, Loligo, Starfish, Balanoglossus.

d. Chordate specimens : Branchiostoma, Petromyzon, Scolidon, Lates, Rhacophorous, Axolotl larva, Tylotriton, Gekko; Hemidactylus, Turtle, Naja, Chiroptera

Practical:(After Mid-Term)

PC & NF:

Paper III. Laboratory Course Work// No. of Lectures :21.

1.Dissection

i) Apple snail : Digestive system

iii) Lata : Afferent branchial system

2.Mounting and preparation

i) Mouth parts of cockroach

REPEAT:

3.ii) Identification with reasons :

c. Non-chordate specimens : Plasmodium vivax, Paramecium, Scypha, Obelia, Sea-anemone, Ascaris, Hirudinaria, Scorpion, Bombyx mori, Lamellidens, Achatina, Loligo, Starfish, Balanoglossus.

d. Chordate specimens : Branchiostoma, Petromyzon, Scolidon, Lates, Rhacophorous, Axolotl larva, Tylotriton, Gekko; Hemidactylus, Turtle, Naja, Chiroptera

2nd. yr:

Theory:(Before Mid-Term)

PC:

Paper II: Theory// No. of Lectures :15.

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

1. General characters of hormones : Histology of pituitary, thyroid and pancreas.

Naming and function of hormones secreted from Pituitary, Thyroid and Pancreas

2. Insects endocrine glands (in brief)

5. Classification of carbohydrate, protein and lipid; concept of glycolysis, neoglucogenesis (aerobic, anaerobic & fermentation)

NF:

Paper II: Theory

Group A :Functional Anatomy of Chordates// No. of Lectures :08.

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)

Group B.Ecology, Animal Behavior, Biodiversity and Wildlife// No. of Lectures :15.

1. Ecology & Ecosystem-definition, components, energy flow, food chain, food web, ecological pyramids

2. Population- definition and growth

3. Community- definition and types

6. Honey bee- Hive, castes and their roles

Theory:(After Mid-Term)

PC:

Paper II: Theory

Group A :Functional Anatomy of Chordates// No. of Lectures :19.

3.Structure & function of the followings :

ii) Pharynx (Branchiostoma); stomach (Columba & Bos)

iii) Respiratory structures and Respiration : Gill (Fish), accessory respiratory organs (Fish); lung (Columba and Cavia), Air sac – Columba

iv) Circulatory structure and circulation: Single circuit heart (fish); double circuit heart (Amphibia and Mammals)

v) Excretory system-pro, meso and meta-nephric kidneys;

vi) Nervous system- Brain in Cavia,

vii) Origin and distribution of cranial nerves (in Cavia).

Group-C:Histology, Endocrinology, Animal Physiology & Biochemistry // No. of Lectures :15.

3. Composition of vertebrate blood; clotting & coagulation; ABO blood group & Rh factor

4. Enzyme- classification & characteristics; mechanism of enzyme action; effects on enzymetic action (pH and temperature)

6. Physiology of nerve impulse & synaptic transmission (in brief)

7. Osmoconformers and Osmoregulators; Osmoregulation in fishes

NF:

Paper II: Theory

Group A :Functional Anatomy of Chordates// No. of Lectures :08.

2. Functional anatomy in relation to respiration (Bufo); Circulation (Columba)

3. Structure & function of the followings :

i) Integument-general structure & function; integumentary derivatives (scales in fishes, horny scales & plates in reptiles; feathers of Columba ; hair of mammals, Camel).

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

4. Basic concept of Biodiversity, Biodiversity hotspots.

5. Pollution- air, water and noise (Sources of pollutants, effects on human life and control measures)

7. Conservation of wild life- purpose & methods, concept of Biosphere Reserve, importance & strategies of wildlife conservation; conservation act and application. National park & Wildlife Sanctuary, Animal cruelty and prevention act.

8. Scheduled I of wild life protection Act, 1972 and importance of schedules in conservation.

9. Basic idea of ecotoxicology and xenobiotics, concept of EIA.

Practical:(Before Mid-Term)

PC & NF:

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

1.Dissection

i) Apple snail : Digestive and nervous systems

iii) Lata : afferent and efferent, brain, cranial nerves (IX th and X th origin and distribution).

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-anaemone, 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.

Practical:(After Mid-Term)

PC & NF:

Paper III. Laboratory Course Work// No. of Lectures :33.

1. Dissection

ii) Cockroach: digestive, nervous and female reproductive system.

2. Mounting and preparation :

i) Mouth parts of cockroach

iv) Placoid scale of Scoliodon sp, and Ctenoid scale of fin fish

3.

ii) Haemolymph of cockroach (Leishman/Giemsa stain)

iii) Gut contents of cockroach for protozoa (Fixation, staining and identification)

4. Report on field study tours:

Zoological garden and Museum.

5. Viva –voce discussion.

3rd yr:

Theory:(Before Mid-Term)

PC:

Paper IV

Group –C.Evolutionary Biology// No. of Lectures :10.

1. Definition of systematics & taxonomy

2. Species as a unit of evolution (definition and types: biological, sibling and polytypic species)

5. Anatomical and Physiological adaptations : Aquatic, Desert and Volant animals.

NF:

Paper IV

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.

Group –C.Evolutionary Biology// No. of Lectures :07.

3. Chemical basis of origin of life.

6. Zoogeographical realms & their subdivisions with characteristic fauna.

Theory:(After Mid-Term)

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, Pathogenecity and clinical features of (a) *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.**

NF:

Paper IV

Group –C.Evolutionary Biology// No. of Lectures :03.

- 4. Hardy-Weinberg equilibrium in relation to natural selection- a brief idea.**

Practical:(Before Mid-Term)

PC & NF:

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

1. Experimental works :

b. 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, Hypophthalmichthys molitrix, Cyprinus carpio, Ctenopharyngodon idellus, Tenuulosa (Hilsa) ilisha, Penaeus sp, Macrobrachium rosenbergi.

Practical:(After Mid-Term)

PC & NF:

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.