VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

SYLLABUS FOR CBCS AND SEMESTER SYSTEM

B.Sc. SEM – V

(Effective from June 2016)

ZOOLOGY PAPER – VI (Z – 501)

(Non-chordates)

UNIT - 1

Taxonomy of non-chordates phyla to be studied up to order.

Structural organization of different classes of non-chordates. (Protozoa to Annelida)

UNIT – 2

Study of the following animal types with reference to the structure and functions of various organs of all systems :**Scorpion**

UNIT - 3

Amplification of non-chordate phyla

i. Protozoa : Locomotion, Nutrition & Economic Importance.
ii. Porifera : Canal system, skeletal system & reproduction.
iii. Coelenterata : Polymorphism, coral & coral reefs.
iv. Helminthes : Parasitism & morphological adaptations.
v. Annelida : Metameric segmentation, coelomoducts & nephridia.

UNIT - 4

Phyllogenetic relationships of the following minor phyla and General organization :Brachiopoda, Chaetognatha,

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Zoology Practical – I (Based on paper VI)

(Non-chordates)

1. Classification of following animals up to order:

   Volvox, ceratium, entamoeba, polystomella, plasmodium, opalina, balantidium, leucosolenia, hyalonema, euspongia, obelia, millipora, physalia, valella, rhizostoma, tubipora, alcyonium, cerianthus, pennatula, virgularia, adamsia, zoanthus, favia, fungia, astrea, clinorches, trichinella, sabella, serpula, arenicola, eurythoe, polynoe, acanthobdella,

2. Study of some aquatic invertebrates like euglena, paramoecium, vorticella, hydra, daphnia & Cyclops from the culture.

3. Study of permanent slides:

   L. S. & T. S. of sycon & leucosolenia, sponge spicules and gemmules.

4. The following practicals of **Scorpion** to be studied/taught **only** with the help of charts, models, videos, photographs, permanent slides, working models, simulators etc.

   1) Digestive system

   2) Nervous system

   3) Reproductive system & Pectin as a mounting

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ZOOLOGY PAPER – VII (Z – 502)

(Chordates)

UNIT – 1

Taxonomy of chordate to be studied up to order, including

Protochordata,cyclostomes, Pisces & Amphibia.

UNIT – 2

Study of the following animal types: **Labeo**

UNIT – 3

Comparative Anatomy:

i. Aortic arches

ii. Vertebral column

iii. Heart.

UNIT – 4

Amplification of Chordates:

i. Protochordata: Origin of chordates.

ii. Cyclostomes: Phylogeny & Affinities.

iii. Pisces: Dipnoi, Types of scales, Air bladder.

iv. Amphibia: Origin and evolution, Parental care in amphibian, Neoteny.

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Zoology Practical – II (Based on paper VII)

(Chordates)

1. Classification of following animals up to order.

Oikopleura, Salpa & Doliolum, Lamprey & Myxine.

Pristis, Anabas, Polyodon, Eel, Pterois, Siren, Uraeotyphlus, Bufo.

2. Study of Bony fish as animal types

   1) Digestive system.

   2) Urinogenital system.

   3) Brain.

   4) Prepare temporary mounting of scales from scoliodon (placoid), Labeo (cycloid), mullet (ctenoid)

3. Study of parental care in Amphibia (charts/models/photographs)

4. Comparative Study of Vertebral column in Shark, Frog, Varanus, Pigeon and Rabbit.

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ZOOLOGY PAPER – VIII (Z – 503)

(Biochemistry)

UNIT - 1

Enzymes:-

- Definition and chemical nature, Properties, nomenclature and classification,
- Mechanism of enzyme action, Factors affecting enzyme action
- Enzyme inhibition, Co-enzymes.

UNIT - 2

Carbohydrates:-

- Definition Classification monosaccharide, disaccharides, oligosaccharides and polysaccharides.

  Metabolism: - Glycolysis, TCA & oxidative phosphorylation ((ETS or Biological oxidation), gluconeogenesis, Glycogenesis, Glycogenolysis.

UNIT - 3

Proteins:-

- Definition , classification -simple , conjugated and derived proteins,
- Structure of proteins: - Primary, secondary, tertiary and quarternary.
- Metabolism: - Deamination and transamination. Ornithine cycle
- Hormonal control of protein metabolism

UNIT - 4

Lipids: -

- Definition, classification- simple, compound and derived lipids.
- Metabolism: - β oxidation and synthesis of long chain fatty acids
- Glycerol metabolism, Hormonal control of lipid metabolism.

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ZOOLOGY P PRACTICAL - III (Based on paper VIII)

(Biochemistry)

1. Qualitative test for organic compound.

   a. carbohydrates - glucose, fructose, maltose, lactose& sucrose

   b. proteins: - albumin and casein.

2. Preparation of atomic models :-

   a. glucose, fructose, galactose, maltose, lactose, sucrose, valine,

   b. threonine, glycine, alanine & glycerol.

3. Factors affecting enzymes activity (temperature and pH).

4. To study the digestive enzymes from Human Saliva

5. Detection of amino acid by paper chromatography.

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ZOOLOGY PAPER – IX (Z – 504)

(Embryology and Wild life Biology)

UNIT - 1

The Nature and Scope of embryology

The importance of developmental Zoology, Branches of embryology & applications.

UNIT - 2

Gametogenesis and fertilization:

(i) Spermatogenesis: Formation of spermatids, Spermiogenesis, Factors controlling spermatogenesis, Structure of a typical sperm. Significance of spermatogenesis.

(ii) Oogenesis: Formation of egg (ovum)-multiplication phase . growth phase (previtellogenesis and vitellogenesis) ,maturation phase.

(iii) Fertilization : External and internal fertilization - mechanism of Fertilization ,- capacitation and contact – acrosomal reaction and penetration – activation of ovum migration of pronuclei and amphimixis –theories of fertilization -significance of fertilization.

(iv) Estrous and menstruous cycles, placenta and placentation

UNIT – 3

Study and development of chick

(i) fertilization, cleavage, blastulation, gastrulation, formation of germ layers and primitive streak

(ii) structure of 24,36,42,48,50,60 &72 hours of chick embryo

UNIT - 4

Wild life Biology

(i)Introduction, wild life conservation and management

(ii) Conservation projects: wild ass, tiger, crocodile, black buck.

(iii) Endangered, vulnerable, threatened species

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ZOOLOGY PRACTICAL - IV (Based on paper - IX)

(Embryology and Wild life Biology)

To study the following practicals with the help of charts/models/photographs/specimens/slides/simple methods without dissecting live animals.

1. Different types of mammalian placenta.

2. **Chick embryology**: Unfertilized egg, different stages cleavage, morula, blastula, gastrula, primitive streak, development of 24, 36, 42, 48, 50, 60 and 72 hrs.

3. **Study of projects** – wild ass, lion, tiger, crocodile, and black buck-their locations in map of India, present status and significance.

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ZOOLOGY PAPER – X (Z – 505)

(Forensic science and Toxicology)

UNIT - 1

Definition, scope, history and development of forensic science, basic principles, dactylography, foot prints, tattoo marks, occupational marks, speech and voice

UNIT - 2

Morphology and Biochemistry of human and other animal hair, DNA fingerprinting, wildlife and forensic science.

UNIT - 3

Concept and scope of toxicology: Introduction, history, disciplines of toxicology, toxicants and their classification, toxicity

UNIT - 4

Food-Additives: General account, incidental(indirect) additives, intentional(direct) additives, terms related to adverse reactions to food, food-borne molds and mycotoxins (food contaminants),testing of food additives.

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ZOOLOGY PRACTICAL - V (Based on paper - X)

(Forensic science and Toxicology)

To study the following practicals with the help of charts/models/photographs/specimens/slides/simple methods without using live animals.

1) Study of different types of finger prints and tattoo marks .
2) Study the morphology of different hairs- man,dog,horse,cow,buffalo,goat.
3) Study of various samples of food additives/preservatives and their usages.
   (vinegar, benzoic acid,formic acid,citric acid,gelatin)
4) Study of food contaminants on - bread, chapati, curd, fruits.
5) Tests (only two tests to be performed) of adulterated milk, black pepper, khoya (maava of milk),edible oil, coconut oil, ghee, rabdi, butter.
6) To study DNA finger printing method through chart.

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ZOOLOGY PAPER – XI (Z – 506)

(Genetics and Molecular Biology)

UNIT -1

Gene structure and functions:

Gene concept, location of and size of genes, role of genes, chemical composition and numbers of genes, ultra structure of genes, jumping genes, split genes, sex chromatin.

UNIT -2

Mutations:

Human cytogenetics- Techniques in human chromosomal analysis-

Human Karyotype-chromosomal aberrations and syndromes, Polyploidy, Metabolic disorders, gene mutations. Genetic code and protein synthesis.

UNIT -3

Molecular biology:

(i) Structure of atoms, molecules and chemical bonds

(ii) Composition , structure and formation of biomolecules [proteins, nucleic acids, vitamins]

(iii) Principles of catalysis, enzymes and enzyme kinetics, enzyme regulation, catalysis, mechanism of enzyme, isoenzyme

UNIT - 4

Biophysical chemistry

-(i) Principles of biophysical chemistry[pH, buffer, reaction kinetics, thermodynamics, colligative properties]

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ZOOLOGY PRACTICAL – VI (Based on paper - XI)

(Genetics and Molecular Biology)

1.Karyotyping (Aberrations in human chromosomes by charts.

(Klinefelter'syndrome, Down's syndrome,Philadelphia's syndrome,Turner's syndrome,Cri-du-chat syndrome)

2.Preparation of A---------,T----------,G----------,C---------

By models

3. Preparation of DNA,RNA by models

4. Preparation of Triose, Tetrose, Pentose,Hexose, Triglycerides, Casin, Mucin,

water soluble vitamins, fat soluble vitamins

5. Study of Transgenic animal (dolly sheep)

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FISHERIES (EG)

UNIT- 1 Natural and cultivated ponds-construction, layout, management& productivity.

UNIT- 2 Induced breeding methods in major carp.

UNIT- 3 Fish seed collection and transportation

UNIT- 4 Study of aquarium fishes and its management.

UNIT- 5 Crafts and gears used in fresh and marine water fisheries.

UNIT- 6 Sea / marine pollution