B.Sc. SEM – VI

(Effective from Oct-Nov 2016)

ZOOLOGY PAPER – VI (Z – 601)

(Non chordates)

UNIT - 1

Taxonomy of non-chordates phyla to be studied uptoorder.Structural organization of different classes of nonchordates. (Arthropoda to Echinodermata)

UNIT - 2

Study of the following animal types with reference to the structure and functions of various organs of all systems : **Sepia & Sea star.**

UNIT - 3

Amplification of non-chordate phyla.

- Arthropoda:Respiration,excretion,Neurohormonal regulation ofmoulting and ecdysis, crustacean larvae and significance thereof, Social Insects: Hony Bee, Termite, Ant & Wasp.
- Mollusca:EconomicImportance
- Torsion and detorsion in gastropoda.
- Echinodermata : Water - vascular system, larval forms & evolutionary significance .

UNIT - 4

Phyllogenetic relationships of the following minor phyla and General organization

- Endoprocta
- Ectoprocta.

B.Sc. SEM – VI

ZOOLOGY PRACTICAL – I (Based on paper VI)

(Non chordates)

1 - Classification of following animals up to order.

Apus, Daphnia, Cyclops, Cypris, Squilla, Hippa, Sacculina, Limulus, Mantis, Dragon fly, Ear-wig, Mosquito, Ant, Beetle, Tick, Mite, Dentalium, Heliotis, Patella, Nautilus, Oyster, Mytilus, Doris, Cyprea, Teredo, Solen, Octopus, Loligo, Astropecten, Strongylocentrotus, Synapta, Sand-dollar, Holothurian, Sagitta, Bugula

2 -The following practicals of **Sepia** to be studied **only** with the help of charts, models, videos, photographs, permanent slides, working models, simulators etc.

1) Digestive system, Mountings of Chromatophores and Spermatophores

2) Nervous system, Mountings of jaws & radula

3 - Study of permanent slides :

Crustacean larvae & Echinoderm larvae

B.Sc. SEM – VI

ZOOLOGY PAPER – VII (Z – 602)

(Chordates)

UNIT - 1

Taxonomy of chordate to be studied up to order, including Reptilia, Aves & mammalia.

UNIT - 2

Study of the following **animal types**: **Calotes**.

UNIT - 3

Amplification of chordates:

- Reptilia:- Mesozoic reptiles, Rhyncocephalia and its phylogenetic importance., Poisonous &non poisonous snakes
- Aves :- Bird Migration , Types & development of feathers
  Modifications of beak & feet, Ratitae
- Mammals: - Dentition, Structure & development of tooth, Metatheria, Cetacea, Proboscidea, Primates.

UNIT - 4

Mammalian Histology:

- Pituitary,
- Thyroid,
- Parathyroid
- Adrenal,
- Thymus,
- Gonads

B.Sc. SEM – VI

ZOOLOGY PRACTICAL – II (Based on paper - VII)

(Chordates)

1. Classification of following animals up to order:

Tortoise, Uromastix & Sphenodon, Kite, Robin & Kiwi, Scaly anteater, Porcupine & Loris,

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

1) Cranial nerves.

2) Internal ear and

3) Eye muscles,

3. Study of Mesozoic reptiles (by Models/charts/photographs etc.) like Brontosaurus, Stegosaurus, Iguanodon, Dimetrodon, Allosaurus and Rhamphorhynchus.

4. Poisonous & nonpoisonous snakes

5. Types of feather & Dentition in Dog, Cat, Horse, Rabbit, Rat & man.

6. Study of permanent slides of pituitary, Thyroid, Thymus, Parathyroid, Adrenal, ovary & testis

B.Sc. SEM – VI

ZOOLOGY PAPER – VIII (Z – 603)

(Animal Physiology)

UNIT - 1

Respiration:-

Aquatic & terrestrial respiratory mechanism, Hypoxia, O_2 dissociation Curve. Respiratory quotients ,BMR Transport of gases, exchange of gases, Respiratory pigments, Neural and chemical regulation of respiration.

UNIT - 2

Circulation:-

Structure of mammalian heart, Properties of cardiac muscles , internal circulation (systematic, pulmonary & coronary) Cardiac-cycle and cardiac output, Stroke volume, Blood pressure, ECG ,Blood coagulation, Hormonal, ionic & nervous regulation of heart beat.

UNIT - 3

Chemical coordination:-

Chemical nature and kinds of hormones, Mechanism of hormone action, Regulation of hormone, secretions.

Introduction: - Definition of endocrine, Paracrine and Autocrine system. Significance of endocrine and neuro-endocrine system. Hormones of pituitary gland, thyroid gland, Parathyroid gland, pancreas, adrenal gland, gastrointestinal hormones, testis and ovary.

UNIT - 4

Thermoregulation:-

Heat production and heat loss, Temperature regulating Mechanism

B.Sc. SEM – VI

ZOOLOGY PRACTICAL - III (Based on paper - VIII)

(Animal Physiology)

1. Study of **analytical instrument** principle and applications.

   pH meter, Colorimeter, Centrifuge, Waterbath, lactometer,

   sphygmomanometer, Thomas pipette of haemocytometer,

   RBC count, microtome, balance.

2. **Hematology**:-

   (a) Total RBC count in human blood

   (b) WBC differential count.

3. **Experiments on Human**: Measurement of systolic blood pressure, diastolic pressure, pulse pressure, mean pressure of an individual with the help of sphygmomanometer and stethoscope.

4. Preparation of buffers : Measurement of pH of acid, milk, water, Iso Electric point of casein.

B.Sc. SEM – VI

ZOOLOGY PAPER – IX (Z – 604)

(Entomology)

UNIT – 1

Introduction to Entomology

- History, development, scope & applications of Entomology
- Branches of Entomology
- Evolution of Insects & their position in animal kingdom
- General characteristics of phylum Arthropoda.

UNIT - 2

Agricultural Entomology

- Pests of field crops & their management

  Sugarcane – stem borer, leaf aphids, shoot borer

  Cotton – spotted ball worm, leaf roller, red cotton bug, jassids,

  Oilseed - mustard (aphids and saw fly), sunflower (sucking pest and borer)
- Pests of horticultural crops & their management

  Fruits: apple (plum curculio, codling moth, aphids, tree borer)
  Mango (mango hopper, mealy bug, stem borer, eating caterpillar)

  Vegetables: brinjal (shoot and fruit borer, leaf eating beetles, jassids, leaf roller), Cabbage (moth and maggot fly)
- Insect pests of stored grains & their management (rice weevil, saw toothed grain beetle, Khapra beetle, rice moth, lesser grain borer)

UNIT – 3

Medical Entomology

- Morphology, Vectorship, Pathogenicity & Control of : Mosquito, housefly, Ratfleas, head louse.
- Morphology, Vectorship, Pathogenicity& Control of: Pests of domestic animals, Horse and Cattles.

UNIT - 4

Economic Entomology

- Beneficial Insects (economic importance of honey bee, silkworm, lac insect, pollinators, scavengers, Insect as a source of drugs and dyes)
- Household pests: Morphology, damage caused & Control measure of: Cockroach, Ants and termites & Bed bugs
- Insect pest control methods (Bio control, Integrated pest management, insecticides, pesticides)

➢ Appliances used for pest management

B.Sc. SEM – VI

ZOOLOGY PRACTICAL – IV (Based on paper - IX)

(Entomology)

To study the following practicals with the help of charts/ models/ photographs/ specimens/ slides etc.

1) Branches of entomology, its scopes, applications, development.

2) Identification, pathogenicity and control of pests
   1) Cereals - Khapra beetle (Trogoderma granarium), Locust.
   2) Tobacco - Rove beetle (Bledius latiusculus), Mole cricket.
   3) Sugarcane - Saccharum officinarum.
   4) Fruits- Drosophila melanogaster
   5) Vegetables - Hellula undalis.

3) Morphology, Vectorship, pathogenicity and control of – Anopheles (male – female), Culex (male-female) and Aedes (male-female).

4) Pests of domestic animals: dogs- dog flea (Ctenocephalidies canis), Trichodectes canis. Cats- cat flea (Ctenoce felis). Cattles – Cattle tick (Boophilus microplus), Haemaphysalis cuspidate, H.minuta.

5) Economic importance of arthropods /insects – silk worm, lac insects, honey bees and butterflys as pollinators; lady bug and dermestid beetle as scavengers; Cochinial insects and kermes insects(of oak tree) as dyes; Honey bees, blow fly maggots, centipedes and cantharis fly (Canth vesictoria) as drugs /medicines; Ants, termites, dermestid beetles and bed bugs as harmful insects.

F) Pests management appliances- foggers, insect repellents, sprayers (agri.use and household uses), traps (electric and chemical). Biological pests controller- lizards, frogs, bee eater birds, ladybug beetle and bats.

B.Sc. SEM – VI

ZOOLOGY PAPER – X (Z – 605)

(Cell Biology and Bioinstrumentation)

UNIT - 1

Tools and Techniques:

(i) Electron microscope
(ii) Fluorescence microscope
(iii) Phase contrast microscope
(iv) Paper chromatography
(v) Electrophoresis
(vi) Centrifugation
(vii) DNA Staining

UNIT - 2

Methods for cytology and cytochemical analysis:

(i) Examination of living cells
(ii) Fixation
(iv) Embedding and sectioning
(iv) Cytological staining

UNIT - 3

Cellular organization:

(i) Cell membrane structure and function: structure of cell membrane, lipid bilayer and membrane protein diffusion, osmosis, ion channels, active transport, ion pumps, mechanism of sorting and regulation of intracellular transport.

(ii) Ultra structure and function of intracellular organelles: nucleus, mitochondria, golgi bodies, lysosomes, endoplasmic reticulum, peroxisomes, plastids, vacuoles.

UNIT - 4

Cell ageing and cell death:

Ageing in cells-mechanism of cell death- purpose of cell death.

B.Sc. SEM – VI

ZOOLOGY PRACTICAL - V (Based on paper -X)

(Cell Biology and Bio instrumentation)

1. Study of cell organelles by microphotographs: nucleus, mitochondria, golgi bodies, endoplasmic reticulum, chloroplasts.

2. Microtechnique preparation of permanent slides of different organs,

3. Whole mounting of invertebrates and vertebrates

4. Paper chromatography

B.Sc. SEM – VI

ZOOLOGY PAPER – XI (Z – 606)

(Ecology, Evolution and Ethology)

UNIT - 1

Species interactions: Types of interactions, interspecific competition,

Herbivory, carnivory, symbiosis

UNIT - 2

Biogeography: Major terrestrial biomes, theory of island biogeography,

biogeographical zones of India

UNIT - 3

Emergence of evolutionary thoughts: Lamarck; Darwin-concepts of variation, adaptation, struggle, fitness and natural selection

UNIT - 4

Approaches and methods in study of behavior, insect pheromones, bioluminescence, biological clocks, development of behavior, social communication, social dominance.

B.Sc. SEM – VI

ZOOLOGY PRACTICAL – VI (Based on paper - XI)

(Ecology, Evolution and Ethology)

1. Estimation of Alkalinity and Total hardness of water sample.
2. Estimation of free CO_2 and dissolved O_2 of water sample.
3. Study of Habituation of mosquito larva
4. Study of Antennal grooming behavior (chemotoxis)
5. Study of alarming, attractant, aggression behavior
6. Educational tours/excursions/ visits/primary project write up/other submissions etc.

Important note: Educational tours/excursions/ visits can be conducted during SEM-V **OR** SEM-VI, but will be considered in Sem-VI (Zoology Practical –VI-based on paper- XI) for markings/evaluation.

B. Sc. SEM-VI

FISHERIES (EG)

UNIT -1 Fish migration

UNIT- 2 Parental care in fishes

UNIT- 3 Electric organs in fishes

UNIT- 4 Preservation, processing and by-products of fishes.

UNIT- 5 Fish pathology: bacterial, fungal, ectoparasitic and protozoan diseases of fishes.

UNIT- 6 Dangerous and Venomous fishes.

ZOOLOGY PRACTICALS

B. Sc SEM I, II, III, IV, V, VI

1. B. Sc SEM – I
   ZOOLOGY PRACTICALS (Z – 100 P)
   (Based on paper I and II)

2. B. Sc SEM – II
   ZOOLOGY PRACTICALS (Z – 200 P)
   (Based on paper I and II)

3. B. Sc SEM – III
   ZOOLOGY PRACTICALS (Z – 300 P)
   (Based on paper III, IV& V)

4. B. Sc SEM – IV
   ZOOLOGY PRACTICALS (Z – 400 P)
   (Based on paper III, IV, V)

5. B. Sc SEM – V
   ZOOLOGY PRACTICALS (Z – 500 P)
   (Based on paper VI, VII, VIII, IX, X & XI)

6. B. Sc SEM –VI
   ZOOLOGY PRACTICALS (Z – 600 P)
   (Based on paper VI, VII, VIII, IX, X & XI)

I/C Registrar,
Veer Narmad South Gujarat University
SURAT