VEER NARMAD SOUTH GUJARAT UNIVERSITY

SYLLABUS FOR S.Y.B.Sc.

ZOOLOGY

(Effective from JUNE---2007)

AIM OF SYLLABUS

Paper-III To study Classification and general body Organization of Non-Chordates. Variation, Isolation, and Adaptations in Evolution. Vermiculture, Sericulture and Apiculture in Economic Zoology.

Paper-IV To study Classification and general body organization of Chordates, Histology, Embryology, Osteology and Ethology.

Paper-V To study internal Physiology of body Activities, Cell Organelles & their functions and Genetic inheritance.

Theory Paper-III

(Non-Chordates, Evolution and Economic Zoology)

UNIT-I Introduction to classification: General study of Non-Chordate Phylas up to Subclass with Examples:-
Protozoa, Porifera, Colenterata, Helminthes, Annelida, Arthropoda, Mollusca, Echinodermata and Hemichordata.

UNIT-II Study of the following animals types with references to the structures and functions of various organs of all systems e.g. Hydra, Liver fluke, Leech and Cockroach.

UNIT-III Evolution: Variation, Isolation and adaptations (Fossorial, Cursorial, Deep sea, Cave dwelling, Protective coloration and Mimicry).

UNIT-IV (i) Sericulture: Life-History of Indian species of Mulberry silk-worm (*Bombyx mori)*, Management of silk industry

including rearing, spinning and reeling; Types and economic importance of silk.

(ii) Apiculture: Life-History of honey bees, Economic importance of honey and wax.

(iii) Vermiculture: Economic importance.

Theory Paper IV

(Chordates, Histology, Embryology, Osteology and Ethology)

UNIT-I General study of the following Protochordates and Chordates up to sub-class with examples:
Urochordata, Cephalochordata, Cyclostomata, Pisces, Amphibia, Reptilia, Aves and Mammals.

UNIT-II Study of the following animal types with reference to their systematic position, structure and functions of various organs of all systems e.g. Scoliodon & Pigeon.

UNIT-III Histology: Study of the following mammalian tissues- Stomach, intestine, liver, salivary glands, pancreas, kidney and gonads.

UNIT-IV Embryology: Different types of eggs and cleavage patterns, development in Amphioxus (up to tubulation).

UNIT-V Osteology: Study of girdles in Scoliodon, Frog, Varanus, Pigeon and Rabbit.

UNIT-VI Ethology: Nesting and brooding behaviour in birds and fish migration.

Theory paper-V

(Physiology, Cytology and Genetics)

UNIT-I Physiology:

(i) Respiration: Exchange of gases, transport of gases, respiratory pigments, respiratory

quotient (RQ), Control of respiration and B.M.R.

(ii) Muscle coordination-Types and structure of muscle fibres, Physiology of muscle contraction and energetic.

(iii) Nervous coordination-Synapse and mechanism of nerve impulse conduction.

(iv) Excretion and Osmoregulation-Structure of uriniferous tubule and physiological process of excretion (including counter current mechanism) and urine formation, osmoregulation in fresh and marine waters, osmosis, diffusion and Donnan's equilibrium.

(v) Hematology-Composition of Blood, Haemopoiesis and blood groups.

(iv) Thermoregulation-Heat production and heat loss, temperature regulating mechanism.

UNIT-II Cytology:

General structure of cells, structure and function of cell organelles-Plasma membrane, nucleus, nucleolus, centrioles, endoplasmic reticulum, lysosomes, ribosomes,mitochon-dria, Golgi complex and chromosomes (structural organization and types) cell cycle and cell division-mitosis and meiosis.

UNIT-III Genetics:

Structure and function of genetic material, types of RNA, chromosome mapping, linkage, crossing over, sex-determination and dosage compensation (Heteropycnosis), sex-linked inheritance, cytoplasmic inheritance, sigma substance, milk factor in mice, kappa particles, coiling of shell in Lymnaea. Modified Mendalian ratio 9:7, 9:3:4, 9:6:1, 12:3:1, 13:3, 15:1, 9:3:3:1 (in cock comb) Simple examples based on above types.

P R A C T I C A L S

PRACTICAL-I (Based on Paper-III)

(A) Classification of following animals upto sub-class Amoeba, Euglena, Monocystis, Paramoecium, Leucosolenia, Hyalonema, Spongilla, Hydra, Porpita, Aurelia, Gorgonia, Sea-anemone, Planaria, Taenia, Liver-fluke, Ascaris, Earthworm, Leech, Nereis, Peripetus, Crab, Palaemon, Lobster, Cockroach, Housefly, Grasshopper, Termite, Silverfish, Centipede, Millipede, Spider, Scorpion, Moths, Butterfly, Chiton, Pila, Unio, Aplysia, Sepia, Starfish, Brittlestar, Sea-urchin, Sea-cucumber, Feather star and Balanoglossus.

(B) Dissections of the following animals:

1) Cockroach:-Digestive, Reproductive and Nervous systems. Mounting-Gizzard, first and second thoracic spiracles.

2) Leech:-Digestive, Reproductive and Nervous systems. Mounting-Jaws and salivary glands.

(C) Evolution: Study of following animals (with the help of specimens, photographs or models) with reference to their evolutionary significances : Peripatus, Platypus, Archaeopteryx, Limulus, sphenodon, Trilobite.

Adaptations : Leaf insect, Stick insect, Australian sea-horse, Eye-spot butterfly, Soft-shelled turtle, Lantern fly, Parrot.

(D) Study of permanent slides:-

Hydra: Budding, L.S. and T.S of hydra and T.S. passing through testes and ovaries.

Liver fluke: Larval forms-miracidium, redia and cercaria

Cockroach: Male and Female gonapophysis, mouth parts, salivary glands, trachea and cornea.

(E) Sericulture: Study of different stages of life-history-egg, larva, pupa and adult.

Apiculture: Members of colonies, economic importance of honey and wax.

PRACTICAL-II (Based on Paper-IV)

A-1) Classification of following animals upto sub-class
(With the help of specimens, photographs or models)
ascidian,amphioxus, lamprey, myxine, Scoliodon, electricray, protopterus, clarius, sea horse, ophiocephalus, labeo, frog, hyla, bufo, salamander, amblystoma, caecilian, calotes, Varanus, turtle, Dhaman, russel viper, cobra, krait, pigeon, koel, sparrow, duck billed platypus, bat, rat.

A-2) Identification poisonous and nonpoisonous snakes:
Dhaman, Russell viper, cobra, krait, python, sea snake.

B- Dissection of following animals:

(1) Scoliodon (in preserved animal) : Digestive, urinogenital system and brain. Mounting of placoid scales & ampulla of lorenzini.

C- Study of amphioxus embryology (With the help of specimens/chart/models): uncleaved egg, 2,4,8 & 32 cell stage, cleavage blastula & gastrula, T.S. of amphioxus passing through intestine, pharynx, ovary testis & tail.

D-Histology (mammalian) : Study of permanent slides of stomach, intestine, liver, pancreas, salivary gland, kidney & gonads.

E- Osteology (With the help of specimens/chart/models): Study of girdles in shark, frog, Varanus, pigeon & rabbit.

F-Ethology (With the help of specimens/chart/models): Tailor bird, weaver bird, sparrow, duck, pigeon, salmon & hilsa.

Practical-III (based on paper-V)

A-Physiology & Haematology:

1) to study ABO blood groups & Rh factors
2) Preparation of blood smears for the study of RBC & WBC.
3) Total count of WBC from human blood.
4) Estimation of Haemoglobin from human blood
5) To determine normal & abnormal constituents of urine

B- Cytology:

1) Demonstration of microtome & micro technique
2) Preparation & study of different stages of mitosis from onion root tip & meiosis from testis of cockroach
3) Permanent slides of mitosis & meiosis

C- Genetics:

1) Cytoplasm inheritance: coiling of shell in limnea
2) Probabilities: Widow's peak, free or attached ear lobes, length of index finger, flat foot, eye colour & tongue rolling

List of Reference book

Invertebrate zoology	T.C.Majupuria	Pradip publication
Chordate zoology	-do-	-do-
A TB of Zoology Vol.-I&II	P.S.Dhami & J.K.Dhami	R Chand & co.
Invertebrate series & minor phyla	R.L.Kotpal	Rastogi & Co.meerut
Chordate Zoology	N. Arumugam	
Invertebrate Zoology	-do-	Saras Publication
Chordate Zoology	E.Iyyer	
Invertebrate Zoology	E.L.Jordan & P.S.Varma	S. Chand & co.
Chordate Zoology & Animal physiology	E.L.Jordan & P.S.Varma	S. Chand & co.
Animal physiology	M.P Arora	Himalaya publsh.
A TB of Embryology & Developmental biology	N. Arumugam M.P Arora	Saras Publication K.nath R.nath
A mannual of prac. Zoology chordates	P.S.Varma	S. Chand & co.
Prac. invertebrate Zoology & Cytology	V.B.rastogi	k.nath R.nath pub.
A TB of Ani. Physiology	A.K.Berry	Emkay public.
A TB of Ani.histology	A.K.Berry	Emkay public.
Essentials of cytology	C.B.powar	Emkay public.
Genetics	R.L.kotpal	Rastogi & co.
A TB of Genetics	V.B.rastogi	k.nath R.nath pub.
Genetics	M.P Arora & sandhu	Himalaya publsh.
A TB of Genetics	P.K.Gupta	Rastogi & co.
Fundamentals of Ethology, Ecology and Biometry	S.Prasad	Emkay Publ., Delhi

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