

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI
SHRI PUNDLIK MAHARAJ MAHAVIDYALAYA, NANDURA (Rly.)
DEPARTMENT OF ZOOLOGY
B.Sc-II, SEMESTER-III
SYLLABUS
SUB: LIFE AND DIVERSITY OF CHORDATA

There shall be following paper and practical for B.Sc.Part-I Semester One examination. The syllabus is based on 6 theory periods and six practical periods per week (Total 75-80 theory Sessions and 25 practical sessions during the complete semester). There shall be one compulsory paper of 3 hours duration, in theory as stated below and practical examination extending for four hours. Every examinee shall offer the following paper of 100 marks, (Out of which 80 marks will be for written examination and 20 marks for internal assessments) and practical examination of 50 marks. Candidates are required to pass separately in theory and practical examination.

Marks

1) Paper-I: Life and diversity of Chordata...	
Theory (Written)	80
Internal assessments	20
2) Practical:	50
Total :	150 Marks

THEORY

UNIT-I :

Phylum Chordata;

Origin of Chordata.

Protochordates:– Type study: Amphioxus: Habits and habitat , External Characters - Digestive system and feeding, Excretory organs, gonads- Affinities of Amphioxus.

Affinities of Agnatha:

Series Pisces:

Type study: Scoliodon sarokawah (Dogfish) – Habits and habitat, External Characters, Digestive system: alimentary canal and digestive glands, Respiratory system: respiratory organ and mechanism of respiration, circulatory System: Structure and working of Heart, major arteries and veins, Lateral line receptors, Migration in fishes-Types, causes and significance.

UNIT-II :

Class Amphibia:

Type Study – Rana tigerina, Habits and habitat, external, characters. Respiratory organs- Circulatory system; Structure of Heart, major arteries and veins, urinogenital system.. Parental care in amphibia.

Class Reptilia:

Type study- Calotes versicolor- Habits and habitat, External characters, circulatory system- Structure of Heart, major arteries and veins. Urinogenital system, snake venom and anti-venom,

UNIT-III :

Class Aves:

Type study: Pigeon-Columba livia Habits and habitat, External characters, Respiratory system, urinogenital system. Flight adaptations, Migration in birds.

Class Mammalia:

Primitive mammals: salient features of Prototheria and Metatheria, Morphology of mammalian endocrine glands. Aquatic mammals.

UNIT-IV :

Evolution: Meaning and scope,

Indirect Evidences of evolution: Evidences of organic evolution- morphological and anatomical, physiological and biochemical, embryological.

Direct evidences of evolution: Paleontological evidences: Fossils and fossilization: petrified fossils dead and preserve bodies cast and moulds, trails and foot prints, condition for fossilizations.—, Radioactive carbon dating of fossils - Living fossils.Importance of fossil record. Evidences from connecting links- Peripatus and Archaeopteryx.

UNIT-V :

Evolutionary Processes: Natural selection: Darwinism.Lamarckism.

Speciation - definition of species –mode of speciation – Allopatric and Sympatric speciation.

Modern concept of organic evolution-Neo Darwinism. Population Genetic :Hardy –Weinberg equilibrium, Gene pool, Gene frequency, Genetic drift, Convergent, Divergent and Parallel evolution, Coevolution

UNIT-VI :

Adaptive radiations in mammals.

Evolution of Man- brief accounts of Parapithecus, Dryopithecus, Ramapithecus, Australopithecus, Homo erectus Neanderthal man, Cro-Magnon man and modern man. Evolution of heart, aortic arches, and urinogenital systems of vertebrates Animal Adaptation: Desert aquatic and terrestrial.

PRACTICAL

Two practical per week of 3 periods duration. Examination shall be of 5 Hrs duration and of 50 marks.

A) Taxonomy of Chordata:

1. General characters and classification of Phylum Chordata:
2. General characters and Classification up to orders of the following chordates or as per the availability in the laboratory from the major orders, (Specimens or Models):

Protochordata: Herdmania, Doliolum Salpa, Amphioxus.

Agnatha: Petromyzon, Myxine.

Pisces: Scoliodon, Torpedo, Acipenser, Exocoetus. Hippocampus

Amphibia: Ichthyophis, Salamander, Bufo, Hyla.

Reptilia: Varanus, Phrynosoma, Chameleon, Cobra, krait, Russell's viper, Typhlops, Hydrophis

Aves: Duck, Woodpecker, Kingfisher, Parrot.

Mammalia: Mongoose, Squirrel. Manis. Bat., monkey,

B) Dissections:

1. Dissection - afferent and efferent branchial vessels, cranial nerves, internal ear of scoliodon.
2. Dissection - Digestive system, Arterial system, venous system, reproductive system of rat.
3. Permanent micro-preparations .a. Fish scales. b. Ampullae of Lorenzini. c. Eyeball muscles.
4. Observations of air bladder in air breathing fishes.

C) Osteology: Rabbit, Varanus (excluding loose bones of skull).

D) Evolution:

1. Study of fossils, including living fossils.
2. Study of Evidences of evolution.
 - i. Analogous and Homologous organs.
 - ii. Connecting links (Peripatus, Archaeopteryx, Limulus)
 - iii. Embryological evidences
3. Application of Hardy-weinberg`s law
4. Study of Mesozoic Reptiles (By Models/Charts).
5. Mimicry, coloration in animals.
6. Beak and Leg modifications with reference to: Parrot, Woodpecker, Kingfisher, Heron, Duck, Sparrow/Pigeon Hawk/Kite, Owl.

E) Histological Slides :- Amphioxus, Frog, Rat

Amphioxus : T.S, Oral hood, Pharynx, Tail

Frog :- T.S. lung, Stomach, Kidney, T.S. Intestine,

Rat :- T.S. Liver, Pancreas, Ovary, Testis, Pituitary, Thyroid, Adrenal

Distribution of Marks For Practical Examination.

Time: 4hr.	Marks
1. Dissection: -.....	10
2. Permanent stained micro preparation.....	05
3. Spotting. (Specimens, Slides, bones, fossil)	10
4. Practical on evolution	10
5. Class record.....	05
6. Viva – Voce.....	05
7. Submission of study tour report.....	05

Total Marks:.....50

References

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3. A Text Book of Chordates – H.S.Bharmah and Kavita Juneja.
4. Modern Text Book of Zoology Vertebrate – R.L.Kotpal, Rastogi Publication Meerut.
5. A Text Book of Chordates – A .Thangamani, S, Prasannakumas, L.M.Narayanan and
6. Arunmugam Saras Publication, Nagercoil.
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