

IV SEMESTER B.Sc ZOOLOGY
PAPER IV: COMPARATIVE ANATOMY, HUMAN ANATOMY, CELL
BIOLOGY AND HISTOLOGY

52 hrs	
UNIT: I 09 hrs	
COMPARATIVE ANATOMY	
1.1. Respiratory organs in Fishes (gills and swim bladders), Respiratory organs in Amphibians, Reptiles, Birds and Mammals (lungs).	03 hrs
1.2. Circulatory system:	
a. Evolutionary trends of heart in vertebrates.	6 hrs
b. Evolutionary trends of aortic arches in vertebrates.	
UNIT: II	
COMPARATIVE ANATOMY	
2.1. Evolution of kidney in vertebrates: Pronephros, Mesonephros and Metanephros types in different classes of vertebrates.	02 hrs
2.2. Evolution of brain in vertebrates: Shark, Frog, Lizard, Bird and Rabbit.	05 hrs
UNIT : III	
HUMAN ANATOMY	
3.1.	11hrs
Digestive system, Lung, Heart, Kidney, Brain, Eye and Ear.	08 hrs
3.2. Limb bones (except bones of hand and foot).	03 hrs
3.3. Human osteology: Skull, lower jaw, vertebral column, sternum, rib, pectoral and pelvic girdles,	
UNIT: IV	
CELL BIOLOGY	
4.1. Ultra structure of an animal cell:	07 hrs
a. Plasma membrane: Chemical composition, structure -Fluid mosaic model, role of lipids in maintaining fluidity of cell membrane. Functions – transport across cell membrane: passive transport (simple and facilitated diffusion; osmosis) and active transport (Na ⁺ , H ⁺ and Ca ²⁺ pumps, exocytosis, endocytosis -phagocytosis and pinocytosis);	
b. Nucleus.	
c. Cytoplasm: Ultra structure and functions of mitochondrion, golgi complex, endoplasmic reticulum, ribosomes, lysosomes and centrosomes.	
4.2. Cell cycle and regulation	01 hr
4.3. Biology of cancer: Introduction, general properties of cancer cells, carcinogens, prevention and regulation; chemotherapy, radiotherapy and gene therapy	02 hrs
4.4. Cell senescence and Apoptosis	01 hr
Immunology:	04 hrs

- a. Active and Passive immunity.
- b. Hypersensitivity and allergy.
- c. Autoimmune diseases: Myasthenia gravis and rheumatoid arthritis.

UNIT: V
HISTOLOGY

10 hrs

- 5.1.** Histological features of mammalian organs: Tongue, Stomach, Pancreas, Liver, Kidney, Ovary, Testis, Pituitary, Thyroid and Adrenal. 10 hrs

REFERENCES:

1. Comparative Anatomy by Romer(1977)
2. Comparative Anatomy by Eten and Kent(1954)
3. Principles of Anatomy and Physiology by Gerard J Tortora and Nicholas P. Anagnostakos. 6th Ed(1990)
4. Cell biology by C.B. Power Vol I and II(2010)
5. Cell biology by Tomer(2005)
6. Cellular and Molecular Biology Rastogi publication(2017)
7. Bloom and D. Faweett. 1972. Text book of histology. 10th Ed.
8. Janis Kuby. 1997. Text book of Immunology. 3rd Ed.
9. Histology by Bailey(1975)
10. Histology by Bevelander(1979)
11. Histology by Ham(1987)
12. Histology by Berry(2015)
13. Atlas of Histology Papero
14. Atlas of Histology Freeman(1966)

IV SEMESTER B.Sc., ZOOLOGY PRACTICAL
PAPER – IV: COMPARATIVE ANATOMY, HUMAN ANATOMY,
CELLBIOLOGY AND HISTOLOGY

COMPARATIVE ANATOMY

15 Units

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| 01. | Comparative study of derivatives of integument in Vertebrates: Carapace and Plastron of Tortoise/Turtle, horn of Sheep/Goat/Cow, hoof of Sheep/ Goat/Cow. | 01 Unit |
| 02. | Comparative study of skin of Vertebrates – Fish, Frog and Rat. | 01 Unit |
| 03. | Comparative study of heart of Vertebrates: Fish (Shark), Amphibian (Frog), Bird (Pigeon) and Mammal (Rat). | 01 Unit |
| 04. | Comparative study of brain of Vertebrates: Fish (Shark), Amphibian (Frog), Bird (Pigeon) and Mammal (Rat). | 01 Unit |
| | Human Osteology: Skull. Lower jaw, vertebral column, sternum, rib, pectoral and pelvic girdles, limb bones (except bones of hand and foot). | 04 Units |

CELL BIOLOGY

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| 01. | Preparation of Squash: Onion root tip for mitosis/ Grass hopper testis for meiosis. | 02 Units |
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HISTOLOGY

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| 01. | Permanent slides of sections of mammalian organs- Tongue, Stomach, Pancreas, Liver, Kidney, Ovary, Testis, Pituitary, Adrenal and Thyroid. | 05 Units |
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SCHEME OF PRACTICAL EXAMINATION
IV SEMESTER B.Sc ZOOLOGY,
COMPARATIVE ANATOMY, HUMAN ANATOMY, CELLBIOLOGY
AND HISTOLOGY: PRACTICAL – IV

Duration: 3 hrs.

Max.Marks: 35

01.	Comparative Anatomy: Identify A and B and comment on the evolutionary trends with labelled diagrams.	08 marks
02.	Human osteology: Identify C and D and comment with labelled diagrams.	05 marks
03.	Cell Biology: Prepare a temporary squash of the given material. Identify and comment on the observed stage.	05 marks (3+2)
04.	Histology: Identify and comment on the histological features of E, F and G with neat labelled diagrams	2 marks (3x4)
05.	Class Records	05 marks
	Total	35 marks

