ANDHRA KESARI UNIVERSITY

Programme: B.Sc. Honours in Zoology (Major)

w.e.f. AY 2023-24

COURSE STRUCTURE

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
I	I	1	Introduction to Classical Biology	3+2	4
	I	2	Introduction to Applied Biology	3+2	4
	II	3	Animal Diversity-I Biology of Non-Chordates	3	3
			Animal Diversity-I Biology of Non-Chordates Practical Course	2	1
	II	4	Cell and Molecular Biology	3	3
			Cell and Molecular Biology Practical Course	2	1

I -Semester

Course: 1 INTRODUCTION TO CLASSICAL BIOLOGY

Hours/Week: 5 **Credits: 4**

Learning objectives

The student will be able to learn the diversity and classification of living organisms and understand their chemical, cytological, evolutionary and genetic principles.

Learning Outcomes

1. Learn the principles of classification and preservation of biodiversity 2. Understand the plant anatomical, physiological and reproductive processes. 3. Knowledge on animal classification, physiology, embryonic development and their economic importance.

4. Outline the cell components, cell processes like cell division, heredity and molecular processes.

5. Comprehend the chemical principles in shaping and driving the macromolecules and life processes.

Unit 1: Introduction to systematics, taxonomy and Ecology.

1.1. Systematics – Definition and concept, Taxonomy – Definition and hierarchy.

1.2. Nomenclature – ICBN and ICZN, Binomial and trinomial nomenclature.

1.3. Ecology – Concept of ecosystem, Biodiversity and conservation,

1.4-Pollution and climate change.

Unit 2: Essentials of Botany.

2.1. The classification of plant kingdom – Eichler system of classification.

2.2. Vegetative parts of a Plant and physiological processes –outlines of water & mineral absorption, Ascent of sap, transpiration, Photosynthesis, Respiration and Growth hormones.

2.3. Structure of flower – Essential and Non – Essential organs, microsporangium -

structure of anther, megasporangium, structure of ovule, pollination & fertilization.

2.4. floriculture, landscaping & plant Nursery (Basics)

Unit 3: Essentials of Zoology

3.1. The classification of Kingdom Animalia and Chordata.

3.2 Heart, lung, kidney, Organ Systems & their functions in Humans; Hormones and Disorders

3.3 Developmental Biology – Basic process of development (Gametogenesis, Fertilization, Cleavage and Organogenesis)

3.4 Economic Zoology – Sericulture, Apiculture, Aquaculture

Unit 4: Cell biology, Genetics and Evolution

4.1. Cell theory, Ultrastructure of prokaryotic and eukaryotic cell.

4.2. Chromosomes and heredity – Structure of chromosomes nucleosome, DNA & RNA.

4.3. Cell Cycle, Mitosis & Meiosis.

4.4. Mendel's laws & Darwin theory of evolution.

Unit 5: Essentials of chemistry

5.1. Definition and scope of Chemistry, applications of Chemistry in daily life. Branches of Chemistry.

5.2. Chemical bonds – ionic, covalent, noncovalent – Vander Waals, hydrophobic, hydrogen bonds.

5.3. Green chemistry principles, prevention of waste, prevention of hazardous components,

5.4. Green synthesis of catechol, accident prevention & safety measures.

References

1. Sharma O.P., 1993. Plant taxonomy. 2nd Edition. McGraw Hill publishers. 2. Pandey B.P., 2001. The textbook of botany Angiosperms. 4th edition. S. Chand publishers, New Delhi, India.

3. Jordan E.L., Verma P.S., 2018. Chordate Zoology. S. Chand publishers, New Delhi,India. 4. Rastogi, S.C., 2019. Essentials of animal physiology. 4th Edition. New Age International Publishers.

5. Verma P.S., Agarwal V.K., 2006. Cell biology, genetics, Molecular Biology, Evolution and Ecology. S. Chand publishers, New Delhi, India.

6. Satyanarayana U., Chakrapani, U., 2013. Biochemistry. 4th Edition. Elsevier publishers. 7. Jain J.L., Sunjay Jain, Nitin Jain, 2000. Fundamentals of Biochemistry. S. Chand publishers, New Delhi, India.

8. Karen Timberlake, William Timberlake, 2019. Basic chemistry. 5th Edition. Pearson publishers.

9. Subrata Sen Gupta, 2014. Organic chemistry. 1st Edition. Oxford publishers.

ACTIVITIES:

1. Make a display chart of the life cycle of nonflowering plants.
2. Make a display chart of the life cycle of flowering plants.
3. Study of stomata
4. Activity to prove that chlorophyll is essential for Photosynthesis
5. Study of pollen grains.
6. Observation of pollen germination.
7. Draw the Ultrastructure of Prokaryotic and Eukaryotic Cell
8. Visit to Zoology Lab and observe different types of preservation of specimens
9. Hands-on experience of various equipment – Microscopes, Centrifuge, pH Meter, Electronic Weighing Balance, Laminar Air Flow
10. Visit to Zoo / Sericulture / Apiculture / Aquaculture unit
11. List out different hormonal, genetic and physiological disorders from the society

I -Semester

Course: 2 INTRODUCTION TO APPLIED BIOLOGY

Hour/Weeks: 5 **Credits: 4**

Learning objectives

The student will be able to learn the foundations and principles of microbiology, immunology, biochemistry, biotechnology, analytical tools, quantitative methods,and bioinformatics.

Learning Outcomes

1. Learn the history, ultrastructure, diversity and importance of microorganisms.
2. Understand the structure and functions of macromolecules.
3. Knowledge on biotechnology principles and its applications in food and medicine.
4. Outline the techniques, tools and their uses in diagnosis and therapy.
5. Demonstrate the bioinformatics and statistical tools in comprehending the complexbiological data.

Unit 1: Essentials of Microbiology

1.1. History and Major Milestones of Microbiology; Contributions of Edward Jenner, LouisPasteur, Robert Koch.

1.2. Groups of prokaryotic microbes – Bacteria (Structure, and Types), archaebacteria, Mycoplasma; Eukaryotic Microbes(outlines)

1.3. Applications of microorganisms in – Food, Agriculture, Environment, and Industry.

1.4. Viruses – plant virus – TMV (Structure and Disease Symptoms) Animal virus – polio virus (Structure and Disease Symptoms) & Bacteriophage(Structure and Reproduction Outlines)

Unit 2: Essentials of Biochemistry and Immunology

2.1. Biomolecules I

Introduction of carbohydrates & classification – mono di and Polysaccharides.

Lipids. Introduction, Structure & types – Biological importance.

2.2. Biomolecules II

Amino acids – classification, properties, structure & functions.Proteins – classification, properties, structure & functions.

2.3. Biomolecules III DNA –

Structure & TypesRNA –

Structure & Types

2.4. Immune **System –** Immunity,

types of Immunity, cells & organs

of Immune Systems.

Unit 3: Essentials of Biotechnology

3.1. History, scope, and significance & branches of biotechnology.

3.2. Recombinant DNA Technology and Vectors-PBR322 & PUC18

3.3. Transgenic plants – Uses and applications-B. T Cotton. Transgenic animals – DollySheep.

3.4. Environmental Biotechnology – Bioremediation, Bio – Fuels, Bio-fertilizers & Biopesticides.

Unit 4: Analytical Tools and Applications

4.1. Microscopy – Simple, compound and electron microscope.

4.2. Southern Blotting Northern Blotting and western blotting

4.3. Electrophoresis

4.4. Monoclonal antibodies and Its applications. Applications in forensics-DNA Fingerprinting and PCR

Unit 5: Biostatistics and Bioinformatics

5.1. Data collection and sampling. Measures of central tendency – Mean, Median, Mode.

5.2. Measures of dispersion – Range, standard deviation, Basics of Chi-square Test and t-test

5.3. Introduction to Bioinformatics – Genomics, Proteomics, types of biological databases – NCBI, EBI.

5.4. Accessing Nucleic Acid and Protein databases, NCBI, Genome Workbench

REFERENCES

1. Gerard J., Tortora, Berdell R. Funke, Christine L. Case., 2016. Microbiology: An Introduction. 11th Edition. Pearson publications, London, England.

2. Micale, J. Pelczar Jr., E.C.S. Chan., Noel R. Kraig., 2002. Pelczar Microbiology. 5thEdition. McGraw Education, New York, USA.

3. Sathyanarayana U., Chakrapani, U., 2013. Biochemistry. 4th Edition. Elsevier publishers.

4. Jain J.L., Sunjay Jain, Nitin Jain, 2000. Fundamentals of Biochemistry. S. Chandpublishers, New Delhi, India.

5. R.C. Dubey, 2014. Advanced Biotechnology. S. Chand Publishers, New Delhi, India.

6. Colin Ratledge, Bjorn, Kristiansen, 2008. Basic Biotechnology. 3rd Edition. CambridgePublishers.

7. U. Sathyanarayana, 2005. Biotechnology. 1st Edition. Books and Allied Publishers pvt. ltd.,Kolkata.

8. Upadhyay, Upadhyay and Nath. 2016. Biophysical Chemistry, Principles and Techniques. Himalaya Publishing House.

9. Arthur M. Lesk. Introduction to Bioinformatics. 5th Edition. Oxford publishers. 10.

AP Kulkarni, 2020. Basics of Biostatistics. 2nd Edition. CBSpublishers.

ACTIVITIES

1. Identification of a given organism as harmful or beneficial.

2. Observation of microorganisms from house dust under microscope.

3. Finding microorganisms from pond water.
4. Visit to a microbiology industry or biotech company.
5. Visit to a wastewater treatment plant.
6. Retrieving a DNA or protein sequence of a gene'
7. Performing a BLAST analysis for DNA and protein.
8. Problems in biostatistics.
9. Field trip and awareness programs on environmental pollution by different types ofwastes and hazardous materials.
10. Demonstration on basic biotechnology lab equipment.
11. Preparation of 3D models of genetic engineering techniques.
12. Preparation of 3D models of transgenic plants and animals.

[**NOTE**: In the colleges where there is availability of faculty for microbiology and biotechnology, those chapters need to be handled by microbiology and biotechnology faculty.In other colleges, the above topics shall be dealt by Botany and Zoology faculty.

SEMESTER-II

COURSE 3: ANIMAL DIVERSITY-I BIOLOGY OF NON-CHORDATES

Theory Credits: 3 3 hrs/week

LEARNING OBJECTIVES:

- To understand the taxonomic position of protozoa to helminthes.
- To understand the general characteristics of animals belonging to protozoa to hemichordata.
- To understand the structural organization of animals phylum from protozoa to hemi chordata.
- To understand the origin and evolutionary relationship of different phyla from protozoa to hemi chordata.
- To understand the origin and evolutionary relationship of different phylum from annelids to hemichordates.

LEARNING OUTCOMES: By the completion of the course the graduate should able to –

- Describe concept of animal kingdom classification and general characters of Protozoa
- Classify Porifera and Coelenterata with taxonomic keys
- Classify Phylum Platy & Nemathelminthes using examples, parasitic adaptation
- Describe Phylum Annelida & Arthropoda using examples and economic importance of vermicomposting & economic importance of insects.
- Describe Mollusca, Echinodermata & Hemi chordata with suitable examples in relation to the phylogeny

SYLLABUS:

UNIT-I

1.1 Whittakers five kingdom concept and classification of Animal Kingdom.
1.2 Protozoa General Characters and classification up to classes with suitable examples
1.3 Protozoa Locomotion & nutrition
1.4 Protozoa reproduction

Activity: Assignment /Seminar on the above
Evaluation: Marks to be awarded for written and oral presentations

UNIT –II

2.1 Porifera General characters and classification up to classes with suitable examples
2.2 Canal system in sponges
2.3 Coelenterata General characters and classification up to classes with suitable examples
2.4 Polymorphism in coelenterates & Corals and coral reefs

Activity: Assignment /Seminar /Quiz/Project on the above
Evaluation: Evaluation of Written part + Evaluation of oral Presentation, Assessment of studentsin Quiz participation and Ranking - Evaluation of Project Report and oral presentation

UNIT – III

3.1 Platyhelminthes General characters and classification up to classes with suitable examples
3.2 Parasitic Adaptations in helminthes
3.3 Nemathelminthes General characters and classification up to classes with suitable examples
3.4 Life cycle and pathogenicity of *Ascaris lumbricoides*

Activity: Assignment /Seminar /Quiz/Project/Peer teaching on the above
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity

UNIT – IV

4.1 Annelida General characters and classification up to classes with suitable examples
4.2 Vermiculture - Scope, significance, earthworm species, processing, Vermicompost, economic importance of vermicompost
4.3 Arthropoda General characters and classification up to classes with suitable examples
4.4 *Peripatus* - Structure and affinities

Activity: Assignment /Seminar /Quiz/Project/Peer teaching on the above
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity

UNIT – V

5.1 Mollusca General characters and classification up to classes with suitable examples
5.2 Pearl formation in Pelecypoda
5.3 Echinodermata General characters and classification up to classes with suitable examples
Water vascular system in star fish
5.4 Hemichordata General characters and classification up to classes with suitable examples
Balanoglossus - Structure and affinities

Activity: Assignment /Seminar /Quiz/Project/Peer teaching on the above
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity

Co-curricular activities (suggested)

- Preparation of chart/model of phylogenic tree of life, 5-kingdom classification
- Visit to Zoology Museum or Coral Island as part of Zoological tour
- Charts on polymorphism
- Clay models of canal system in sponges
- Plaster-of-paris model of *Peripatus*
- Construction of a vermicompost in each college, manufacture of manure by students and donating to local farmers
- Chart on pearl forming layers using clay
- Visit to a pearl culture rearing industry/institute
- Live model of water vascular system
- Observation of Balanoglossus for its tubicolous habit

REFERENCE BOOKS:

- L.H. Hyman „*The Invertebrates' Vol I, II and V.* – M.C. Graw Hill Company Ltd.

- Kotpal, R.L. 1988 - 1992 Protozoa, Porifera, Coelenterata, Helminthes, Arthropoda, Mollusca, Echinodermata. Rastogi Publications, Meerut.
- E.L. Jordan and P.S. Verma „*Invertebrate Zoology'* S. Chand and Company.
- R.D. Barnes „*Invertebrate Zoology'* by: W.B. Saunders CO., 1986.
- Barrington. E.J.W., „*Invertebrate structure and Function'* by ELBS.
- P.S. Dhami and J.K. Dhami. Invertebrate Zoology. S. Chand and Co. New Delhi.
- Parker, T.J. and Haswell,„*A text book of Zoology'* by, W.A., Mac Millan Co.London.
- Barnes, R.D. (1982). *Invertebrate Zoology*, V Edition‖

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SEMESTER-II

COURSE 3: ANIMAL DIVERSITY-I BIOLOGY OF NON-CHORDATES

Practical Credits: 1 2 hrs/week

LEARNING OBJECTIVES

- To understand the importance of preservation of museum specimens
- To identify animals based on special identifying characters
- To understand different organ systems through demo or virtual dissections
- To maintain a neat, labelled record of identified museum specimens

SYLLABUS:

Study of museum slides / specimens / models (Classification of animals up to orders)

- Protozoa: Amoeba, *Paramoecium, Paramoecium Binary fission and Conjugation, Vorticella, Entamoeba histolytica, Plasmodium vivax*
- Porifera: *Sycon, Spongilla, Euspongia, Sycon*- T.S & L.S, Spicules, Gemmule
- Coelenterata: *Obelia – Colony & Medusa, Aurelia, Physalia, Velella, Corallium,Gorgonia, Pennatula*
- Platyhelminthes: *Planaria, Fasciola hepatica, Fasciola* larval forms – Miracidium,Redia, Cercaria, *Echinococcus granulosus, Taenia solium, Schistosoma haematobium*
- Nemathelminths: *Ascaris (Male & Female), Drancunculus, Ancylostoma,Wuchereria*
- Annelida: *Nereis, Aphrodite, Chaetopteurs, Hirudinaria,* Trochophore larva
- Arthropoda: Cancer, *Palaemon*, Scorpion, *Scolopendra, Sacculina, Limulus, Peripatus,* Larvae - Nauplius, Mysis, Zoea, Mouth parts of male &female *Anopheles*and *Culex,* Mouthparts of Housefly and Butterfly.
- Mollusca:*Chiton, Pila, Unio, Pteredo, Murex, Sepia, Loligo, Octopus, Nautilus,* Glochidium larva
- Echinodermata: *Asterias, Ophiothrix, Echinus, Clypeaster, Cucumaria, Antedon,* Bipinnaria larva
- Hemichordata: *Balanoglossus,* Tornaria larva

Dissections:

Computer - aided techniques should be adopted or show virtual dissections Dissection of edible (Prawn/Pila) invertebrate as per UGC guidelines

An ―Animal album‖ containing photographs, cut outs, with appropriate write up about the above-mentioned taxa. Different taxa/ topics may be given to different setsof students for this purpose

RFERENCE WEB LINKS:

- https://virtualmicroscopy.peabody.yale.edu/
- https://tnhm.in/category/assorted-gallery-for-vertebrates-and-invetebrates/invertebrates/
- http://www.nhc.ed.ac.uk/index.php?page=24.25.312
- https://biologyjunction.com/invertebrate-notes/
- https://lanwebs.lander.edu/faculty/rsfox/invertebrates/
- http://www.zoologyresources.com/uploadfiles/books/dc64b77d8769325515d17c945e461b45.pdf

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SEMESTER-II

COURSE 4: CELL & MOLECULAR BIOLOGY

Theory Credits: 3 3 hrs/week

LEARNING OBJECTIVES

- To understand the cell and distinguish between prokaryotic andeukaryotic cell
- To understand the role of different cell organelles in maintenance of lifeactivities
- To acquaint the students with the concept s of cell division and cell cycle
- To acquaint student with basic concepts of molecular biology as to how characters are expressed with a coordinated functioning of replication, transcription and translation in all living beings
- To acquaint the students on the biological importance of biomolecules.

LEARNING OUTCOMES:

The overall course outcome is that the student shall develop deeper understanding of what life is and how it functions at cellular level. This course will provide students with a deep knowledge in Cell and molecular biology by the completion of the course the graduate shall able to –

- Understand the basic unit of the living organisms and to differentiate the organisms by their cell structure.
- Describe fine structure and function of plasma membrane and different cell organelles of eukaryotic cell.
- Explain the cell cycle and bioenergetics of the cell
- Understand the central dogma of molecular biology and flow of genetic information from DNA to proteins

- Understand the gene expression phenomenon and biological importance of biomolecules

SYLLABUS:

UNIT – I Cell Biology-I

1.1 Definition, history, prokaryotic and eukaryotic cells, virus, viroids, mycoplasma
1.2 Electron microscopic structure of animal cell.
1.3 Plasma membrane –Models and Fluid mosaic model
1.4 Transport functions of plasma membrane-Active – passive- facilitated.

Activity: Model preparation of cell/Assignment /Students Seminar /Quiz/Project/Peer teaching on the above
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity

UNIT – II Cell Biology-II

2.1 Structure and functions of Golgi complex & Endoplasmic Reticulum
2.2 Structure and functions of Lysosomes & Ribosomes
2.3 Structure and functions of Mitochondria & Centriole
2.4 Structure and functions of Nucleus & Chromosomes

Activity: Model preparation of cell organelles/Assignment /Students Seminar /Quiz/Project/Peer teaching on the above
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity

UNIT – III Cell Biology-III
3.1 Cell Division- mitosis, meiosis
3.2 Cell cycle – stages- check points- regulation
3.3 Abnormal cell growth- cancer- apoptosis
3.4 Bio energetics- Glycolysis-Krebs cycle-ETS

Activity: Model preparation cell division /Assignment /Students Seminar /Quiz/Project/Peer teaching/Report writing after watching any video on the above
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity

UNIT IV: Molecular Biology-I
4.1 Central Dogma of Molecular Biology
4.2 Basic concepts of - DNA replication – Overview (Semi-conservative mechanism, Semi-discontinuous mode, Origin & Propagation of replication fork)
4.3 Transcription in prokaryotes – Initiation, Elongation and Termination, Post-transcriptional modifications (basics)
4.4 Translation – Initiation, Elongation and Termination

Activity: Model preparation of DNA/Assignment /Students Seminar /Quiz/Project/Peer teaching/Report writing after watching any video on the above
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity

UNIT V: Molecular Biology-II
5.1 Gene Expression in prokaryotes (Lac Operon); Gene Expression in eukaryotes
5.2 Biomolecules- Carbohydrates (Glucose- structure-properties- biological importance only)
5.3 Biomolecules- Protein (Amino acid- structure- properties- biological importance only)
5.4 Biomolecules- Lipids (Fatty acid- structure - properties- biological importance only)

Activity: Assignment /Students Seminar /Quiz/Project/Peer teaching/Report writing after watching any video on the above
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the above activity

Co-curricular activities (Suggested)
- Model of animal cell
- Working model of mitochondria to encourage creativity among students
- Photo album of scientists of cell biology
- Charts on plasma membrane models/cell organelles
- Charts on central dogma/lac operon/genetic code
- Model of semi-conservative model of DNA replication
- Power point presentation of any of the above topics by students

REFERENCES:

- Lodish, Berk, Zipursky, Matsudaria, Baltimore, Darnell „Molecular Cell Biology"W.H. Freeman and company New York.
- Cell Biology by De Robertis
- Bruce Alberts, Molecular Biology of the Cell
- Rastogi, Cytology
- Varma & Aggarwal, Cell Biology
- C.B. Pawar, Cell Biology
- Molecular Biology by Frei fielder
- Instant Notes in Molecular Biology by Bios scientific publishers and Viva BooksPrivate Limited
- James D. Watson, Nancy H. Hopkins „Molecular Biology of the Gene"

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SEMESTER-II

COURSE 4: CELL & MOLECULAR BIOLOGY

Practical Credits: 1 2 hrs/week

LEARNING OBJECTIVES

- Acquainting and skill enhancement in the usage of laboratory microscope
- Hands-on experience of different phases of cell division by experimentation
- Develop skills on human karyotyping and identification of chromosomaldisorders
- To apply the basic concept of inheritance for applied research
- To get familiar with phylogeny ad geological history of origin & evolution ofanimals

SYLLABUS:

1. Preparation of temporary slides of Mitotic divisions with onion root tips
2. Observation of various stages of Mitosis with prepared slides
3. Observation of various stages of Meiosis with prepared slides
4. Mounting of salivary gland chromosomes of Chironomus
5. Test for carbohydrate in given biological sample (Benedicts test)
6. Test for Protein in given biological sample (Nitric acid test -white ring)
7. Test for lipid in the given biological sample (Saponification test)

RFERENCE WEB LINKS:

- https://cbi-au.vlabs.ac.in/
- https://www.youtube.com/watch?v=xhnUZAyNdQk
- https://www.youtube.com/watch?v=l8LXQq5_VL0
- https://www.labster.com/simulations
- https://www.sciencecourseware.org/BiologyLabsOnline/protected/TranslationLab/index.php
- https://virtual-labs.github.io/exp-analysis-of-carbohydrates-au/procedure.html
- https://www.labxchange.org/library/items/lb:LabXchange:f10fd7ad:lx_simulation:1
- http://www.zoologyresources.com/uploadfiles/books/dc64b77d8769325515d17c945e461b45.pdf

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SEMESTER-V
COURSE 15 B: LIVE STOCK MANAGEMENT -II
(DAIRY PRODUCTION AND MANAGEMENT)
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ANDHRA KESARI UNIVERSITY-ONGOLE, PRAKASAM DISTRICT
Single Major Programme from the Year 2023-24 Onwards
Programme-B.Sc. Zoology Honours -Question Paper model,
First Year-Semester-1
Course1 - Introduction to Classical Biology

Time: 3 Hours Total Marks: 75

PART –A

Answer any Five of the following

Note: Draw labelled diagrams wherever necessary and Each unit must carry two questions 5X5=25 Marks

1.

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PART –B

Answer any Five of the following

Note: Draw labelled diagrams wherever necessary 5X10=50 Marks

Each unit must carry two questions

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ANDHRA KESARI UNIVERSITY-ONGOLE, PRAKASAM DISTRICT
Single Major Programme from the Year 2023-24 Onwards
Programme-B.Sc. Zoology Honours- Question Paper model,
First Year-Semester-1
Course 2 - Introduction to Applied Biology

Time: 3 Hours Total Marks: 75

PART –A

Answer any Five of the following

Note: Draw labelled diagrams wherever necessary and Each unit must carry two questions

5X5=25 Marks

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PART –B

Answer any Five of the following

Note: Draw labelled diagrams wherever necessary 5X10=50 Marks

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ANDHRA KESARI UNIVERSITY-ONGOLE, PRAKASAM DISTRICT
Single Major Programme from the Year 2023-24 Onwards
Programme-B.Sc. Zoology Honours- Question Paper model,
First Year-Semester-2
Course 3 - Animal Diversity-I Biology of NonChordates

Time: 3 Hours Total Marks: 75

PART –A

Answer any Five of the following

Note: Draw labelled diagrams wherever necessary and Each unit must carry two questions

5X5=25 Marks

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PART –B

Answer any Five of the following

Note: Draw labelled diagrams wherever necessary 5X10=50 Marks

Each unit must carry two questions

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ANDHRA KESARI UNIVERSITY-ONGOLE, PRAKASAM DISTRICT

Single Major Programme from the Year 2023-24 Onwards

Programme-B.Sc. Zoology Honours-Practical Question Paper model, Semester-2

Course 3 - Animal Diversity-I Biology of Non-Chordates practicals

Time: 3 Hours **Total Marks: 50**

1. **Model dissection/virtual dissection: Draw a neat labelled diagram of the model dissection displayed/virtual dissection displayed. (Identification 3 marks + Diagram 5 marks + Labelling 4 marks)**

   12 Marks

2. **Identify, draw diagram, label it and write notes on given spotters/specimens/slides (Identification 1 mark + Diagram 1 mark + Labelling 1 mark+ Notes 1 mark)**

   A. **7X 4=28 Marks**

   B.

   C.

   D.

   E.

   F.

   G.

3. **Record** **5Marks**
4. **Viva/Voce** **5 Marks**

Total: 50 Marks

ANDHRA KESARI UNIVERSITY-ONGOLE, PRAKASAM DISTRICT
Single Major Programme from the Year 2023-24 Onwards
Programme-B.Sc. Zoology Honours -Question Paper model,
First Year-Semester-2
Course 4 – Cell and Molecular Biology

Time: 3 Hours Total Marks: 75

PART –A

Answer any Five of the following
Note: Draw labelled diagrams wherever necessary and Each unit must carry two questions
5X5=25 Marks

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PART –B

Answer any Five of the following
Note: Draw labelled diagrams wherever necessary 5X10=50 Marks
Each unit must carry two questions

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ANDHRA KESARI UNIVERSITY-ONGOLE, PRAKASAM DISTRICT

Single Major Programme from the Year 2023-24 Onwards

Programme-B.Sc. Zoology Honours-Practical Question Paper model, Semester-2

Course 4 – Cell and Molecular Biology Practicals

Time: 3 Hours **Total Marks: 50**

1. **Preparation of temporary slides of mitotic divisions with onion root tips. Write aim, apparatus,**
   detailed procedure and discuss on results. (Aim-2 marks + apparatus-2 marks + Detailed procedure-5 marks +Labelled diagrams-3 marks + Results-3 marks.)
   15 marks
2. **Mounting of salivary gland chromosomes of Chironomus larva. Write aim, apparatus, detailed**
   procedure and discuss on results. (Aim-2 marks + apparatus-2 marks + Detailed procedure-5 marks + Labelled diagrams-3 marks + Results-3 marks.)
   15 Marks
3. **Identify the substances in the given biological samples. Write aim, apparatus, reagents, Principle, detailed procedure and discuss on results. (Aim-2 marks + apparatus-2 marks + Detailed procedure-3 marks+ Results-3 marks.)** **10 Marks**

4. **Record** **5Marks**
5. **Viva/Voce** **5 Marks**

Total: 50 Marks