ANDHRA KESARI UNIVERSITY

B.Sc. Honours in Botany: Single Major

w.e.f AY 2023-24 onwards

COURSE STRUCTURE

Year	Semester	Course	Title	No. Hrs./ Week	No. of Credits
I	I	1	Introduction to Classical Biology	5	4
		2	Introduction to Applied Biology	5	4

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 societ

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 complex biological data.

Unit 1: Essentials of Microbiology

1.1. History and Major Milestones of Microbiology; Contributions of Edward Jenner, Louis Pasteur, 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 – Dolly Sheep.

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. 5th Edition. 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. Chand

publishers, 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. Cambridge Publishers.
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. CBS publishers.

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 of wastes 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.

ANDHRA KESARI UNIVERSITY-ONGOLE, PRAKASAM DISTRICT

Single Major Programme from the Year 2023-24 Onwards Programme- B.Voc

Honours. Horticulture/Agriculture/Medical Lab Technology

&

B.Sc.HonoursBotany/Microbiology/Zoology/Aquaculture/Biochemistry/Biotechnology

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. Unit-1
2. Unit-1
3. Unit-2
4. Unit-2
5. Unit-3
6. Unit-3
7. Unit-4
8. Unit-4
9. Unit-5
10. Unit-5

PART –B

Answer any **Five** of the following

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

(Paper setters must give the 2 questions from Each unit)

11. Unit-1
12. Unit-1
13. Unit-2
14. Unit-2
15. Unit-3
16. Unit-3
17. Unit-4
18. Unit-4
19. Unit-5
20. Unit-5

ANDHRA KESARI UNIVERSITY-ONGOLE, PRAKASAM DISTRICT

Single Major Programme from the Year 2023-24 Onwards Programme- B.Voc Honours. Horticulture/Agriculture/Medical Lab Technology

&

B.Sc.HonoursBotany/Microbiology/Zoology/Aquaculture/Biochemistry/Biotechnology

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

1. Unit-1
2. Unit-1
3. Unit-2
4. Unit-2
5. Unit-3
6. Unit-3
7. Unit-4
8. Unit-4
9. Unit-5
10. Unit-5

PART –B

Answer any **Five** of the following

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

(Paper setters must give the 2 questions from Each unit)

11. Unit-1
12. Unit-1
13. Unit-2
14. Unit-2
15. Unit-3
16. Unit-3
17. Unit-4
18. Unit-4
19. Unit-5
20. Unit-5

II Semester

Course 3: Non-Vascular Plants (Algae, Fungi, Lichens and Bryophytes)

Credits -3

I. Learning Objectives: By the end of this course the learner has:

1. To realize the characteristics and diversity of non-vascular plants.
2. To recognize the ecological and economic value of algae, fungi, lichens and bryophytes.
3. To inquire the habit, habitat, morphological features and life cycles of selected genera of non-vascular plants.

II. Learning Outcomes: On completion of this course students will be able to:

1. Compile the general characteristics of algae and their significance in nature.
2. Compare and contrast the characteristics of different groups of algae.
3. Summarise the important features of fungi and their economic value.
4. Distinguish the characteristics of different groups of fungi.
5. Elaborate the features and significance of amphibians of plant kingdom
6. Explain the diversity among non-vascular plants.

III. Syllabus of Theory:

Unit-1: Introduction to Algae **8Hrs.**

1. General Characteristics of algae: Occurrence and distribution, cell structure, pigments, flagella and reserve food material.
2. Classification of algae: F.E.Fritsch (1935) and Lee (2008)
3. Thallus organization and life cycles in algae.
4. Ecological and economic importance of algae.

Unit-2: Biology of selected Algae **10Hrs.**

1. Occurrence, structure, reproduction and life cycle of:
   (a) Chlorophyceae: *Spirogyra* (b) Phaeophyceae: *Ectocarpus*
   (c) Xanthophyceae: *Vaucheria* (d) Rhodophyceae:*Polysiphonia*

2. A brief account of Bacillariophyceae

3. Culture and cultivation of *Chlorella*

Unit-3: Introduction to Fungi **8Hrs.**

1. General characteristics of fungi and Ainsworth (1973) classification.
2. Thallus organization and nutrition in fungi.

3. Reproduction in fungi (asexual and sexual); Heterothallism and parasexuality.
4. Ecological and economic importance of fungi.

Unit-4: Biology of selected Fungi 10Hrs.

1. Occurrence, structure, reproduction and life cycle of:
   (a) Mastigomycotina: *Phytophthora* (b) Zygomycotina: *Rhizopus*
   (c) Ascomycotina: *Penicillium* (d) Basidiomycotina: *Puccinia*
2. Occurrence, structure and reproduction of lichens; ecological and economic importance of lichens.

Unit-5: Biology of Bryophytes 9Hrs.

1. General characteristics of Bryophytes; Rothmaler (1951) classification.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life cycle of
   (a) Hepaticopsida: *Marchantia* (b) Anthoceratopsida: *Anthoceros*
   (c) Bryopsida: *Funaria*
3. General account on evolution of sporophytes in Bryophyta.

IV. Text Books:

1. Pandey, B.P. (2013) College Botany, Volume-I, S. Chand Publishing, New Delhi
2. Hait,G., K.Bhattacharya & A.K.Ghosh (2011) A Text Book of Botany, Volume-I, New Central Book Agency Pvt. Ltd., Kolkata

V. Reference Books:

1. Fritsch, F.E. (1945) The Structure¬& Reproduction of Algae (Vol. I & Vol. II) Cambridge University Press Cambridge, U.K.
2. Bold, H.C.& M. J. Wynne (1984) Introduction to the Algae, Prentice-Hall Inc., New Jersey
3. Robert Edward Lee (2008) Phycology. Cambridge University Press, New York
4. Van Den Hoek, C., D.G.Mann & H.M.Jahns (1996)Algae : An Introduction to Phycology. Cambridge University Press, New York.
5. Alexopoulos, C.J., C.W.Mims & M.Blackwell (2007) Introductory Mycology, Wiley& Sons, Inc., New York

6. Mehrotra, R.S.& K. R. Aneja (1990) An Introduction to Mycology. New Age International Publishers, New Delhi.
7. Kevin Kavanagh (2005) Fungi; Biology and Applications John Wiley& Sons, Ltd., West Sussex, England.
8. John Webster & R. W. S. Weber (2007) Introduction to Fungi, Cambridge University Press, New York.
9. Shaw, A.J.& B.Goffinet (2000) Bryophyte Biology .Cambridge University Press, New York.

VI. Suggested activities and evaluation methods:

Unit-1: Activity: Algae specimen collection from any water bodies in their locality, recording the characteristics, identification and classifying them according to Fritsch system.

Evaluation method: Evaluating the presentation or report summarizing findings.

Unit-2: Activity: Microscopic observations and recording distinguishing characters of any six algal forms excluding the genera in the syllabus.

Evaluation method: Conducting a Quiz or an exam/ evaluating the chart or drawings or summarized data on similarities and differences.

Unit-3: Activity: Collection or laboratory culture of fungi and reporting the important features.

Evaluation method: Evaluating the report/conducting JAM/Quiz/Group discussion.

Unit-4: Activity: Microscopic observations and summarizing the salient features of the fungal genera and lichen forms in the syllabus**.**

Evaluation method: Conducting a Quiz or an exam/ evaluating the chart or drawings or concise data on similarities and differences.

Unit-5: Collection, characterization, identification and classification of any four bryophytes from their native locality or college campus.

Evaluation method: Assessment of observations and documentation accuracy/presentation or report summarizing findings based on a rubric.

II Semester

Course 3: Non-vascular Plants (Algae, Fungi, Lichens, and Bryophytes)

Credits -1

I. Course Outcomes: On successful completion of this practical course, student shall be able to:

1. Identify some algal and fungal species based on the structure of thalli and reproductive organs.
2. Decipher the lichens and Bryophytes based on morphological, anatomical and reproductive features.

II. Laboratory/field exercises:

Study/ microscopic observation of vegetative, sectional/anatomical and reproductive structures of the following using temporary or permanent slides/ specimens/ mounts:

1. **Algae:** *Spirogyra, Ectocarpus, Vaucheria and Polysiphonia;* a centric and a pennate diatom.
2. Demonstration of culture and cultivation of *Chlorella*
3. Identification of some algal products available in local market.
4. **Fungi:** *Phytophthora, Rhizopus, Penicillium* and *Puccinia*
5. Identification of some fungal products available in the local market.
6. **Lichens:** Crustose, foliose and fruiticose
7. **Bryophyta:** *Marchantia, Anthoceros* and *Funaria*.

II Semester

Course 4: Origin of Life and Diversity of Microbes

Credits -3

I. Learning Objectives: By the end of this course the learner has:

1. To get awareness on origin and evolution of life.
2. To understand the diversity of microbial organisms.
3. To get awareness on importance of microbes in nature and agriculture.

II. Learning Outcomes: On completion of this course students will be able to:

1. Illustrate diversity of viruses, multiplication and economic value.
2. Discuss the general characteristics, classification and economic importance of special groups of bacteria.
3. Explain the structure, nutrition, reproduction and significance of eubacteria.
4. Evaluate the interactions among soil microbes.
5. Compile the value and applications of microbes in agriculture.

III. Syllabus of Theory:

Unit-1: Origin of life and Viruses **10 Hrs.**

1. Origin of life, concept of primary Abiogenesis; Miller and Urey experiment.; discovery of microorganisms, Pasteur experiments, germ theory of diseases.
2. Five kingdom classification of R.H. Whittaker
3. Shape and symmetry of viruses; structure of TMV and Gemini virus.
4. Multiplication of TMV; A brief account of prions, viroids and virusoids; Transmission of plant viruses and their control.
5. Significance of viruses in vaccine production, bio-pesticides and as cloning vectors.

Unit-2: Special groups of Bacteria **7 Hrs.**

1. General characteristics, outline classification and economic importance of following special groups of bacteria:

   a) Archaebacteria b) Chlamydiae c) Actinomycetes

   d) Mycoplasma e) Phytoplasma f) Cyanobacteria

2. Culture and cultivation of *Spirulina*

Unit-3: Eubacteria **8 Hrs.**

1. Occurrence, distribution and cell structure of eubacteria.
2. Classification of Eubacteria based on nutrition.
3. Reproduction- Asexual (Binary fission and endospores) and bacterial recombination (Conjugation, Transformation, Transduction).
4. Economic importance of Eu-bacteria with reference to their role in Agriculture and industry (fermentation and medicine).

Unit-4: Soil microbes – interactions 10Hrs.

1. Distribution of soil microorganisms in soil.
2. Factors influencing the soil microflora - Role of microorganisms in soil fertility.
3. Interactions among microorganisms, mutualism, comensalism, competition, amensalism, parasitism, predation.
4. Microorganisms of rhizosphere, phyllosphere and spermophere; microbial interactions and their effect on plant growth.

Unit-5: Microbes in agriculture 10 Hrs.

1. Mass production, mode of applications, advantages and limitations of bacterial inoculants (*Rhizobium*, *Azotobacter*, *Azospirillum*, Cyanobacteria).
2. Role of Frankia and VAM in soil fertility.
3. Microbial biopesticides: mode of action, factors influencing, target pests; microbial herbicides.

IV. Text Books:

1. Bhattacharjee, R.N., (2017) Introduction to Microbiology and Microbial Diversity, Kalyani Publishers, New Delhi.
2. Dubey, R.C. & D. K. Maheswari (2013) A Text Book of Microbiology, S.Chand & Company Ltd., New Delhi
3. Toshniwal, R.L. (2007) Agricultural Microbiology, Agrobios (India), Jodhpur

V. Reference Books:

1. Pelczar Jr., M.J., E.C.N. Chan & N. R. Krieg (2001) Microbiology, Tata McGraw- Hill Co, New Delhi
2. Presscott, L. Harley, J. and Klein, D. (2005) Microbiology, Tata McGraw –Hill Co. New Delhi.

3. Gyaneshwar, A.D., G.J. Parekh, and V.S. Reddy (2004) Agricultural Microbiology: Plant-Soil Interactions, Research Signpost, Kerala, India
4. Zaki A. Shuler and Zainul Abid (2014) Agricultural Microbiology: Principles and Applications, CRC Press, Boca Raton, Florida, USA

VI. Suggested activities and evaluation methods:

Unit-1: Activity: Collecting scientific literature on historical developments in microbiology.

Evaluation method: Evaluating the report based on a rubric.

Unit-2: Activity: Group discussion on various groups of special bacteria.

Evaluation method: Assessment of active participation, soft skills, communication skills, collaborative skills, time management etc., of a group or a student based on a rubric.

Unit-3: Activity: Presentation or poster summarizing the classification of Eu-bacteria based on nutrition.

Evaluation method: Assessment based on accuracy and understanding.

Unit-4: Activity: Microscopic observation of bacterial samples from soil/ phylloplane in their native place/ college campus.

Evaluation method: Evaluating the report on characteristics and classification of eubacteria.

Unit-5: Activity: Culture and mass production of bioinoculants.

Evaluation method: Skills performed in establishing the culture and mass production.

II Semester

Course 4: Origin of Life and Diversity of Microbes

Credits -1

I. Course Outcomes: On successful completion of this practical course, student shall be able to:

1. Take all necessary precautions in the microbiology laboratory.
2. Handle the instruments and prepare media for laboratory work.
3. Identify various microbes through microscopic observations

II. Laboratory/Field exercises:

1. Microbiology good laboratory practices and biosafety.
2. Study the principle and applications of important instruments (autoclave, hot air oven, incubator, Inoculation loop, Inoculation needle, membrane filter, laminar air flow system, colony counter. biological safety cabinets, BOD incubator, pH meter) used in the microbiology laboratory.
3. Study of Viruses (Gemini and TMV) using electron micrographs/ models.
4. Gram staining technique of Bacteria.
5. Microscopic study of Cyanobacteria using temporary/permanent slides.
6. Microscopic study of Eubacteria using temporary/permanent slides.
7. Study of Archaebacteria and Actinomycetes using permanent slides/ electron micrographs/diagrams.

ANDHRA KESARI UNIVERSITY-ONGOLE, PRAKASAM DISTRICT
Single Major Programme from the Year 2023-24 Onwards
Programme-B.Sc. Botany Honours- Question Paper model,
First Year-Semester-2
Course 3 - **Non-Vascular Plants (Algae, Fungi, Lichens and Bryophytes)**

Time: 3 Hours Total Marks: 75

PART –A

Answer any Five of the following.

Note: Draw labelled diagrams wherever necessary (Paper setter must give two questions from each Unit)

5X5=25 Marks

1.

2.

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10.

PART –B

Answer any Five of the following.

Note: Draw labelled diagrams wherever necessary Marks (Paper setter must give two questions from each Unit)

5X10=50

11.

12.

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20.

ANDHRA KESARI UNIVERSITY-ONGOLE, PRAKASAM DISTRICT

Single Major Programme from the Year 2023-24 Onwards

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

Course 3 - Non-Vascular Plants (Algae, Fungi, Lichens and Bryophytes)

Practical

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

Note: **Answer All questions. Draw well labelled diagrams wherever necessary.**

I. Identify the algal components (**A, B**) in the given mixture. Draw labelled diagrams, classify, and identify giving important characters [Diagrams – 1; classification – 1; characters – 2] 2 x 3 = 6 M

II. Prepare T.S. of the diseased material as a temporary mount **(C**). 10 M
Identify the pathogen giving reasons and describe with the help of diagrams.
(Preparation – 4; Identification – 3; Diagram – 1; Description – 1; Classification – 1)

III. Describe the procedure of Cultivation and Culture if given specimen**(D)** identify the given Specimen [Procedure – 2; Description – 1; Identification – 1] 4 M

IV. Describe anatomical features of the given specimen(E) and Identify the Given specimen (Bryophyta) (Description-2 and Identification-2) 4 M

V. Identify giving reasons the specimens and slides.
SPECIMENS: (F, G,H & I)
(Algae – 1; Fungi-1; Lichen-1, Bryophyta.1) 4 x 2 = 8 M
SLIDES: (J,K,L&M) (Algae – 1; Fungi-1; Lichen-1,Bryophyta.1) 4x 2 = 8M

VI. Record & Viva-Voce 5 + 5 = 10 M

ANDHRA KESARI UNIVERSITY-ONGOLE, PRAKASAM DISTRICT
Single Major Programme from the Year 2023-24 Onwards
Programme-B.Sc. Botany Honours -Question Paper model,
First Year-Semester-2
Course 4 **Origin of Life and Diversity of Microbes**

Time: 3 Hours Total Marks: 75

PART –A

Answer any Five of the following.

Note: Draw labelled diagrams wherever necessary, Examiners must give two questions from each Unit

5X5=25 Marks

1.
2.
3.
4.
5.
6.
7.
8.
9.
10

PART –B

Answer any Five of the following.

Note: Draw labelled diagrams wherever necessary, Examiners must give two questions from each Unit

5X10=50 Marks

11.
12.
13.
14.
15.
16.
17.
18.
19.
20.

ANDHRA KESARI UNIVERSITY-ONGOLE, PRAKASAM DISTRICT

Single Major Programme from the Year 2023-24 Onwards

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

Course 4 – Origin of Life and Diversity of Microbes Practical

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

Note: **Answer All questions. Draw well labelled diagrams wherever necessary.**

I. Describe the procedure of bacterial staining and identify the given Bacterium (A, B) [Procedure – 2; Description – 1; Identification – 1] 4x2 = 8 M.

A. Gram Positive bacteria

B. Gram Negative Bacteria

II. Describe the principle and applications of important instruments (C, D, E & F) 4X4= 16 M

III. Identify and describe given electron micrographs/ models (Viruses) (G&H).

2X4=8 M

IV. Identify giving reasons Permanent Slides (I, J, K & L) (Cyanobacteria-1, Eubacteria-1, Archaebacteria-1&Actinomycetes-1)

4x2=8 M

V. Record & Viva-Voce 5 + 5 = 10 M