

Model Paper

End Semester Examination, December- 2023

Program: B. Sc. (Hons.) Agriculture

Semester: I

Course: Fundamentals of Plant Biochemistry and Biotechnology.

Course Code: 13 A.106

Course Objective:

The course objective will be to make the students to;

1. Understand the importance of Biochemistry, properties of water, pH and buffer, classification, and structures of carbohydrates, lipids and proteins.
2. Comprehend general properties, classification, mechanism of action of enzyme, nucleic Acids and metabolism of carbohydrates and lipids
3. Apply concepts and principles of plant biotechnology and tissue culture in crop Improvement.
4. Know about transgenic crops, PCR technique and different types of marker and Marker Assisted Selection in crop improvement.

Course Outcomes:

At the end of the course, the students will be able to

CO1 Comprehend the fundamental aspects of biochemistry, regulation of biological/biochemical processes.

CO2 Understand synthesis pathways of biomolecules and regulations.

CO3 Impart knowledge of various techniques/fundamentals of plant tissue culture and the concept of plant biotechnology.

CO4 Comprehend the concept and application of transgenic crops with different type of molecular markers and Marker Assisted Selection in crop improvement

Unit / Module-1

Section: I (5 Marks questions, only Lower order Thinking -LOT)

Sl.NO.	Model Question	Bloom Taxonomy	CO
1	Discuss the zwitter ions nature of amino acids.	Understand	CO1
2	Explain briefly the importance of biochemistry.	Remember	CO1
3	Describe briefly the structure and function of phospholipids.	Understand	CO1
4	Compare between lipids and fatty acids.	Understand	CO1

5	Describe the isoelectric pH of protein and its importance.	Understand	CO1
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Section: II (10 Marks questions, both LOT&HOT)

SI.NO.	Model Question	Bloom Taxonomy	CO
1	Distinguish between enzymes and proteins.	Analyse	CO2
2	Explain in detail the structural organisation of proteins.	Analyse	
3	Classify proteins in various ways with suitable examples.	Analyse	CO1
4	Define carbohydrates. Classify them with suitable examples and write their importance.	Remember+ Analyse	CO1
5	Explain the importance of biochemistry in the field of agriculture.	Analyse	CO1

Unit / Module-2

Section: I (5 Marks questions, only Lower order Thinking -LOT)

SI.NO.	Model Question	Blooms Taxonomy	CO
1	Describe the enzymes briefly with their general properties.	Understand	CO2
2	Discuss the A, B and Z DNA.	Understand	CO2
3	Discuss glycolysis briefly.	Understand	CO2
4	Compare between enzymes and protein	Understand	CO2
5	Describe the three major RNA classes; what is each class's function?	Remember	CO2

Section II (10 Marks questions, both LOT&HOT)

SI.NO.	Model Question	Bloom Taxonomy	CO
1	Define enzyme. Explain nomenclature and UBMS classification with suitable examples.	Remember + Analyse	CO2
2	Explain the different theories proposed for the mechanism of enzyme-substrate complex formation.	Analyse	CO2
3	Explain the process of protein biosynthesis (Translation).	Analyse	CO2
4	Discuss different forms of DNA and the main features of the B-form of DNA.	Understand	CO2
5	Illustrate the TCA cycle with a well-labelled diagram.	Apply	CO2

Unit /Module-3

Section: I (5 Marks questions, only Lower order Thinking -LOT)

SI.N O.	Model Question	Bloom Taxonomy	CO
1	Define totipotency. Explain briefly the application of plant tissue culture.	Remember+ Understand	CO3
2	Define micropropagation. Explain briefly the advantages of vegetative propagation.	Remember+ Understand	CO3
3	Define the synthetic seed and explain their significance in crop improvement.	Understand	CO3
4	Define embryo culture. Write its importance.	Remember	CO3
5	Define totipotency. Explain briefly the application of plant tissue culture.	Remember+ Understand	CO3

Section: II (10/15 Marks questions, both LOT&HOT)

SI.NO.	Model Question	Bloom Taxonomy	CO
1	Diagrammatically represent the pollen culture and its major advantages.	Apply	CO3
2	Briefly discuss the application of somatic hybridization.	Understand	CO3
3	Explain the basic requirements and techniques of plant tissue culture.	Analyse	CO3
4	How to develop somaclonal variation in plants and is useful in crop improvement.	Apply	CO3
5	Explain in detail the application and merits of micropropagation over conventional plant breeding methods.	Analyse	CO3

Unit /Module- 4

Section: I (5 Marks questions, only Lower order Thinking -LOT)

SI.NO.	Model Question		CO
1	What are molecular markers? Explain briefly their role in plant breeding.	Remember	CO4
2	Discuss the vectors used in genetic engineering.	Understand	CO4
3	Explain marker-assisted breeding in crop improvement.	Understand	CO4
4	Discuss the term recombinant DNA technology.	Understand	CO4

5	Briefly describe the mechanism for the regulation of transgenic crops.	Remember	CO4
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Section II (10 Marks questions, both LOT&HOT)

SI.NO.	Model Question		
1	Discuss the various applications of transgenic plants and the problems encountered in their production.	Understand	CO4)
2	Explain Agrobacterium-mediated Gene transfer with a suitable diagram.	Apply	(CO4)
3	Explain the marker-assisted breeding method and discuss briefly its role in crop improvements with suitable examples.	Analyse	(CO4)
4	Explain polymerase chain reaction with its major types and applications in plant breeding.	Analyse	(CO4)
5	Enlist the various types of molecular markers, describe their features in detail, and compare their attributes.	Understand	(CO4)

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Disclaimer: - This is a Model Paper. The Question in End semester examination will differ from the Model Paper. This Model paper is meant for practice only.