CBCS SCHEME

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BBT714D

Seventh Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
Agriculture Biotechnology

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Explain the process of Somatic Embryogenesis. Describe its stages with a neat labelled diagram. Also mention two applications of this technique.	10	L2	CO1
	b.	What is in vitro germplasm conservation? Describe its methods and significance in plant biotechnology	10	L1	CO1
		OR			
Q.2	a.	Describe any four applications of plant tissue culture in agriculture. Explain how this technique benefits modern farming practices.	10	L2	CO1
	b.	What are meristem and embryo cultures? Describe their techniques and applications in plant biotechnology.	10	L1	CO1
		Module – 2			
Q.3	a.	What are Genetically Modified Organisms (GMOs)? Explain their role in agriculture and list any four advantages or applications of GMOs in farming.	10	L2	CO1
	b.	How does Marker-Assisted Selection (MAS) improve traditional plant breeding techniques? Mention any four advantages or applications of MAS in agriculture.	10	L1	CO1
		OR			
Q.4	a.	Explain the concept of genome editing. Describe the working principles of CRISPR–Cas9 and TALENs techniques. Compare their applications and advantages in plant biotechnology.	10	L2	CO1
	b.	What is plant transformation? Describe in detail the different methods of gene transfer used in plant biotechnology. Compare direct and indirect gene transfer techniques with examples.	10	L2	CO1
		Module – 3			
Q.5	a.	Explain the process of molecular farming for the production of industrial enzymes. Discuss its advantages and challenges.	10	L2	CO1
	b.	Analyse the role of genetic mutations in crop improvement strategies. Critically assess its relevance in plant breeding, emphasizing four major advantages.	10	L3	CO1

		OR			
Q.6	**a.**	Explain the metabolic engineering of plants for the enhanced production of flavonoids. Discuss the significance and applications of flavonoids in plants and human health.	**10**	**L2**	**CO1**
	b.	Describe the genetic organization of nitrogen fixation genes in bacteria and their significance in agriculture.	**10**	**L3**	**CO1**
		Module – 4			
Q.7	**a.**	Provide an overview of In Vitro Fertilization (IVF), outlining the process and its practical uses. Identify and briefly discuss three ethical or societal issues linked to IVF.	**10**	**L2**	**CO2**
	b.	Explain the concept and methods of cryopreservation in the context of livestock reproduction. Discuss its role in modern animal breeding programs, including four advantages and two major limitations.	**10**	**L2**	**CO2**
		OR			
Q.8	**a.**	What is embryo splitting? Describe the procedure of embryo splitting and explain its applications and advantages in animal breeding.	**10**	**L2**	**CO2**
	b.	Explain the concept of transgenic animal technology. Describe the methods used to create transgenic animals and discuss its applications in research and industry.	**10**	**L2**	**CO2**
		Module – 5			
Q.9	**a.**	Apply your understanding of public perception to suggest ways to improve acceptance of Genetically Modified (GM) technology in agriculture and healthcare. Support your answer with examples.	**10**	**L3**	**CO3**
	b.	Discuss the principles of the Cartagena Protocol on Biosafety to a real-world scenario involving the transboudnary movement of Genetically Modified Organisms (GMOs). How can a country ensure biosafety while facilitating biotechnology trade?	**10**	**L3**	**CO3**
		OR			
Q.10	**a.**	Apply the principles of bioethics to assess the use of Bt crops in agriculture. Suggest practical ways to address ethical concerns while maximizing their potential benefits.	**10**	**L3**	**CO3**
	b.	Explain the importance of experimental protocol approvals in biotechnology research. What are the key steps involved in obtaining such approvals?	**10**	**L3**	**CO3**

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