

Reg. No.

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B.E / B.TECH. DEGREE EXAMINATION, MAY 2023

Sixth Semester

BT18020 – PLANT BIOTECHNOLOGY*(Biotechnology)***(Regulation 2018 / Regulation 2018A)****TIME: 3 HOURS****MAX. MARKS: 100**

- CO 1** Demonstrate the knowledge on the fundamentals of plant cells, structure and functions
CO 2 Interpret the chloroplast and mitochondrial genome function.
CO 3 Identify the nitrogen fixation mechanism
CO 4 Apply the plant tissue culture technique for creating transgenic plants
CO 5 Examine different types of transgenic plants

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

	CO	RBT LEVEL
1. What is c-value paradox?	1	2
2. Where do you encounter a lariat structure in central dogma?	1	3
3. Define CMS.	2	2
4. Justify that mitochondrial genome exists as sub-genomic circle and reason for it.	2	3
5. List the sources of nitrogen for N ₂ fixation.	3	2
6. What are the enzymes involved in the nitrogen fixation through soil and air?	3	2
7. Describe the components of agroinfection.	4	2
8. Draw the map of CaMV genome.	4	3
9. Interpret the pathway targeted by glyphosate.	5	3
10. Outline the steps of ScFv production in plant.	5	4

PART- B (5 x 14 = 70 Marks)

	Marks	CO	RBT LEVEL
11. (a) (i) Explain the types of noncoding DNA available in the plant genome.	(10)	1	2
(ii) Justify that genome complexity is related to various biological processes.	(4)	1	2
(OR)			
(b) (i) Describe about the post translational modifications occurring in plant.	(7)	1	2
(ii) Illustrate the principle of gene regulation in eukaryotes.	(7)	1	2

12. (a)	(i) Describe the reason for the existence of high number of proteins surpassing the number of genes encoded by the chloroplast genome, which machinery is responsible for this?	(7)	2	3
	(ii) Interpret the functions of genes present in the chloroplast genome	(7)	2	3
	(OR)			
(b)	(i) Explain the protein import process of mitochondria and the function of those proteins.	(7)	2	3
	(ii) Analyze the utilization of CMS in the empowerment of plants-based economy.	(7)	2	3
13. (a)	Discuss the relationship between rhizobia and the nitrogen fixation in plants.	(14)	3	3
	(OR)			
(b)	(i) Describe about the elucidation of nif gene cluster by cloning.	(7)	3	3
	(ii) Elaborate the pathways involved in the secondary metabolite production.	(7)	3	3
14. (a)	(i) Explain the steps in the transfer of T-DNA by agrobacterium using suitable schematic diagram.	(7)	4	4
	(ii) Describe about types of tissue culture and their role in creating transgenic plants.	(7)	4	4
	(OR)			
(b)	(i) Justify that viral vectors are a good tool to introduce genes of interest to desired plant cells.	(10)	4	4
	(ii) Illustrate the steps involved in the particle bombardment technique.	(4)	4	4
15. (a)	(i) Explain the mode of action of Cry protein and creation of transgenics based on Cry protein and copy nature strategy.	(10)	5	4
	(ii) Describe in detail about the plant yield improvement by modification of phytochrome proteins.	(4)	5	4
	(OR)			
(b)	(i) Justify that plants can be used for production of high value pharmaceutical proteins.	(7)	5	4
	(ii) Explain the strategy used to create a herbicide resistant plant.	(7)	5	4

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16.	Describe about the transgenic plants which are engineered for fatty acid production and bioplastics.	(10)	5	5