



WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2022



BOTACOR14T-BOTANY (CC14)

PLANT BIOTECHNOLOGY

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.*

1. Answer the following questions in brief: 1×6 = 6
 - (a) What are fusogens?
 - (b) What is colony hybridization?
 - (c) What is humulin?
 - (d) What is shuttle vector?
 - (e) What is palindromic sequence?
 - (f) Define electroporation.

2. Answer any **eight** questions from the following: 3×8 = 24
 - (a) What are the prerequisites of an efficient plasmid vector?
 - (b) How can micropropagation contribute to germplasm conservation?
 - (c) Why is hardening process required before planting tissue cultured plants in the field? Describe the processes. 1½ + 1½
 - (d) What is somatotropin? What are the approved uses of recombinant form of this hormone? 1+2
 - (e) Describe plant tissue culture technique that is used in the production of secondary metabolite.
 - (f) What is cryopreservation? Write down the different steps involved in a typical cryopreservation protocol. 1+2
 - (g) Briefly discuss the strategies for the production of edible vaccine in plants. State two advantages of edible vaccine over traditional vaccine. 2+1
 - (h) Write the steps involved in PCR.
 - (i) Write the types of restriction enzymes with example.
 - (j) Mention the sources and uses of three industrial enzymes.
 - (k) Write the steps of gene cloning in bacteria.
 - (l) What are the biosafety concerns related to GMO?

3. Answer any *two* from the following: 5×2 = 10
- (a) Write the application of somatic embryogenesis. Compare hybrid with cybrid. 3+2
- (b) What are transgenic plants? With particular emphasis on ‘Golden rice’, briefly discuss how nutritional quality of crop plants can be improved using transgenic approach. 1+4
- (c) Why T-DNA from wild type Ti plasmid cannot be used directly as vectors? Briefly discuss, how Ti based vectors are designed for gene transfer in plants. 1+4
- (d) What is restriction mapping? Describe in brief, the experimental procedure in generating restriction maps. How many fragments will be generated in a circular DNA cut with restriction enzyme that has two restriction sites on the DNA? 1+3+1

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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