



**WEST BENGAL STATE UNIVERSITY**

B.Sc. Honours 6th Semester Examination, 2021

**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.*

1. Answer the following questions in brief: 1×6 = 6
  - (a) What is embryo rescue?
  - (b) What is the role of osmoticum during isolation of protoplasts?
  - (c) Define totipotency.
  - (d) What is cybrid?
  - (e) Which bacteria are capable to induce hairy root culture?
  - (f) Name one high capacity cloning vector.
  
2. Answer any **eight** questions from the following: 3×8 = 24
  - (a) Briefly describe the composition of plant tissue culture medium.
  - (b) Describe one technique of protoplast isolation and fusion.
  - (c) What is micropropagation? What are the advantages of micropropagation? 1+2
  - (d) Briefly discuss the gene transfer methods using electroporation and particle gun bombardment.
  - (e) How a somatic embryo differs from a zygotic embryo? Briefly describe the different stages of somatic embryo development in dicots. 1+2
  - (f) How androgenic haploids are produced in culture? Mention two factors which affect haploid production in culture. 2+1
  - (g) What do you mean by elicitation? How it can be used in the production of secondary metabolites in culture? 1+2
  - (h) What do you mean by reporter gene? How GUS gene is used in plant transformation? 1+2
  - (i) Define restriction enzyme. How do bacteria protect themselves from restriction enzymes? 1+2
  - (j) Describe the strategy used for developing herbicide resistant soybean.

(k) Give example of a superbug and mention its role in bioremediation.

(l) What are the differences between YACs and BACs? What do you mean by MCS? 2+1

3. Answer any **two** from the following: 5×2 = 10

(a) Why is *Agrobacterium* referred to as a 'natural genetic engineer'? Draw the naturally occurring Ti plasmid of *Agrobacterium* with essential components. Specify the role of *vir* genes in *Agrobacterium*-mediated transformation. 1+3+1

(b) What is Bt-cotton and how was it developed?

(c) What is the difference between a genomic library and a c-DNA library? What are the major differences in the structure of a gene cloned into either type of library? Give an advantage of each type of clone. 2+2+1

(d) Briefly discuss the various methods of germplasm conservation. Name one cryoprotectant. 4+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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