



বিদ্যাসাগর বিশ্ববিদ্যালয়
VIDYASAGAR UNIVERSITY

Question Paper

B.Sc. Honours Examinations 2021

(Under CBCS Pattern)

Semester - VI

Subject: BOTANY

Paper : C 14-T & P

Plant Biotechnology

Full Marks : 60 (Theory-40 + Practical-20)

Time : 3 Hours

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

[Theory]

Answer *any two* of the following:

2×15=30

1. What is totipotency? Briefly describe with suitable diagram the procedure of protoplast isolation and culture. What is cybrid? Discuss on any three applications of protoplast culture.
1+5+1+3+5 = 15
2. What is electroporation? Briefly discuss the process of electroporation with schematic diagram. What are marker genes? Discuss their role in transgenic plant development?
2+5+3+5 = 15

3. Define cryopreservation with a brief note on its procedure. Illustrate Yeast Artificial Chromosome (YAC). Write short notes on Shuttle vector and Expression vector.

$$6+3+(3+3) = 15$$

4. Briefly state the different methods of direct gene transfer. Elaborate the plant vector mediated transformation in plants. Name two marker genes used in genetic transformation experiment with their respective uses. Write short notes on any two transgenic crops.

$$5+5+2+3 = 15$$

Answer **any one** of the following:

$$1 \times 10 = 10$$

5. Mention the roles of boron (B), copper (Cu), auxin and gibberellins in plant tissue culture. What is somatic embryogenesis? Discuss the advantages of androgenesis.

$$(1+1+1+1)+3+3 = 10$$

6. Explain secondary metabolites with their types and examples. Write a short note on the methods of in vitro production of plant secondary metabolites. What is micropropagation?

$$3+5+2 = 10$$

[Practical]

Answer **any one** of the following:

$$1 \times 20 = 20$$

1. Illustrate the steps to be followed for sterilization of a plant explant taken from garden for in vitro culture, along with a flow chart on it. Enlist the measures to be taken for sterilizing instruments, culture medium and thermolabile chemicals like gibberellic acid.

$$8+12=20$$

2. Mention the principle of Protoplast Culture in plants. Enumerate all requisitions (physical infrastructures and chemicals) for protoplast isolation. Describe the procedures of protoplast isolation along with a flow chart to illustrate that.

$$2+8+10=20$$

3. Mention the principle of gel electrophoresis of nucleic acids. Describe the procedure of gel electrophoresis of plasmid DNA with schematic diagram.

$$5+15=20$$
