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3 (Sem-6/CBCS) BOT HC 2

2024

**BOTANY**

(Honours Core)

Paper : BOT-HC-6026

**(Plant Biotechnology)**

Full Marks : 60

Time : Three hours

**The figures in the margin indicate full marks for the questions.**

1. Fill in the blanks : 1×7=7

(a) \_\_\_\_\_ discovered totipotency.

(b) A single strand of nucleic acid tagged with a radioactive molecule is called a \_\_\_\_\_.

(c) The element \_\_\_\_\_ provides a very stable ultra-low temperature environment.

Contd.

- (d) \_\_\_\_\_ is a type of hybrid that contains a lambda phage cos sequence.
- (e) A \_\_\_\_\_ is a collection of DNA fragments that have been cloned into vectors.
- (f) The basic target of \_\_\_\_\_ is a living cell.
- (g) \_\_\_\_\_ genes are used to track the physical location of a segment of DNA.

2. Answer the following questions very briefly :  
2×4=8

- (a) What are cloning vectors ?
- (b) What is the principle of totipotency ?
- (c) What are the applications of somatic embryogenesis in plant tissue culture ?
- (d) Mention the types and uses of microinjection.

3. Answer **any three** of the following :  
5×3=15

- (a) What do you mean by colony hybridization ? Mention its practical applications.

- (b) Write a note on industrial enzymes.
- (c) Where is linear DNA found? What are the advantages of linear DNA over circular DNA?
- (d) What is the difference between androgenesis and gynogenesis? What do you mean by direct androgenesis?
- (e) Write a note on Ti plasmid.

4. Answer **any three** of the following :

10×3=30

- (a) Write about various types of reporter genes with their applications.
- (b) What do you mean by primary and secondary metabolites? How can biotechnological approaches enhance the production of secondary metabolites?
- (c) Give an account on transgenic crops with improved quality traits.
- (d) What are restriction enzymes? Mention the specific properties of various types of restriction enzymes, alongwith their importance for recombinant DNA technology.

- (e) Differentiate between genomic DNA and cDNA libraries. Discuss about the construction of genomic library.
- (f) Discuss elaborately various steps involved in plant tissue culture.

