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3 (Sem-6/CBCS) BOT HC 2

2023

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 : $1 \times 7 = 7$
- (a) Molecules having new combination of sequences that were not present before are called as _____.
- (b) A single stranded, radiolabelled molecule of nucleic acid is called as _____.
- (c) Golden rice is a bioengineered crop with yellow coloured endosperm that contains _____.

Contd.

- (d) Digestion of DNA using two restriction enzymes in a single reaction is called as _____.
- (e) The two antibiotic resistant genes of vector p^{BR322} imparts resistance against _____ and _____.
- (f) _____ is the first commercially produced human hormone using r-DNA technology.
- (g) _____ vectors are designed to replicate in cells of two different host species.

2. Answer the following very briefly : $2 \times 4 = 8$

- (a) What is the role of DMSO in cryopreservation?
- (b) What are cosmids?
- (c) What is the source of Luciferase gene?
- (d) State the difference between somatic and zygotic embryogenesis.

3. Answer **any three** of the following : $5 \times 3 = 15$

- (a) Discuss the practical applications of somatic embryogenesis.
- (b) Write a note on Lambda phage vector.

(c) Describe an engineered DNA molecule used to clone DNA sequences stating the common gene components present in it.

(d) What is an adaptor molecule? How does it differ from linkers?

(e) Why thermostable polymerase is used in PCR? Mention *one* disadvantage of taq polymerase.

4. Answer **any three** of the following : $10 \times 3 = 30$

(a) What are restriction endonuclease enzymes? Describe the specific properties of type I and type II restriction endonucleases enzymes. Why are they so important for recombinant DNA technology? $1 + 6 + 3 = 10$

(b) Describe various steps for the construction of cDNA library.

(c) Discuss elaborately the direct methods of gene transfer by electroporation and microinjection. $5 + 5 = 10$

(d) What are organic supplements? Give an account of organic supplements used in tissue culture media.

- (e) What are secondary metabolites ? Describe a tissue culture strategy for the production of secondary metabolites.
- (f) Give an account of role of transgenics in bioremediation.