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 : 1×7=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 _____.

(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 : 2×4=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 : 5×3=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 : 10×3=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.
