

Total number of printed pages-7

63/1 (SEM-6) CC14/BOTHC6146

2024

BOTANY

Paper : BOTHC6146

(Plant Biotechnology)

Full Marks : 60

Pass Marks : 24

Time : Three hours

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

1. Choose the correct answers from the following : **(any five)** 1×5=5
- (a) Which of the following is a corresponding marker gene-lux ?
- (i) β -Glucuronidase
 - (ii) Bacterial luciferase
 - (iii) Firefly luciferase
 - (iv) Green fluorescent protein

- (b) Alternative name of biolistics is
- (i) Microprojectile bombardment
 - (ii) Particulate bombardment
 - (iii) Gene gun
 - (iv) All of the above
- (c) The name of (plant) biotechnology is coined by
- (i) Karl Ereky
 - (ii) J. Watson
 - (iii) F. Miescher
 - (iv) Kary Mullis
- (d) Range of diameter of a glass micropipette tip used in microinjection is
- (i) 0.1–10 μ
 - (ii) 1–10 μ
 - (iii) 1–15 μ
 - (iv) 1–20 μ
- (e) Which of the following steps is involved in PCR technique ?
- (i) Denaturation
 - (ii) Annealing
 - (iii) Extension
 - (iv) All of the above

- (f) Full form of GFP is
- (i) Green Fine Protein
 - (ii) Green Fluorescent Protein
 - (iii) Group Fluorescent Protein
 - (iv) All of the above
- (g) Genetically engineered maize contains HbsAg protein which is that capable to fight against
- (i) Hepatitis B virus
 - (ii) Hepatitis A virus
 - (iii) Hepatitis A and B virus
 - (iv) Corona virus
- (h) Which of the following organisms provides pBR322 ?
- (i) Bacteria
 - (ii) Virus
 - (iii) Viroids
 - (iv) *E. coli*

(i) Which vitamin is not used in MS medium ?

(i) Nicotine

(ii) Thiamine

(iii) Pyridoxine

(iv) Riboflavin

(j) Chromosome number of a triploid hybrid plant is

(i) $2n$

(ii) $3n$

(iii) $4n$

(iv) n

2. Answer the following questions : **(any five)**

$2 \times 5 = 10$

(a) Define annealing.

(b) How Bt. cotton is encoded gene for production of insecticidal protein ?

(c) What is the function of bioremediation ?

(d) What is totipotency ? How is it used in tissue culture ?

(e) What do you mean by surface sterilization ?

(f) Write a brief note on cybrid.

(g) What are the sources of incorporated gene of interest in Golden Rice ?

3. Answer the following questions : **(any five)**

$5 \times 5 = 25$

(a) What is restriction endonuclease ? Give a classification of restriction endonuclease with *one* example of each group.

(b) Discuss how antisense mRNA is utilized to make flaunt sans Tomato.

(c) Write a concise note on ethical issues of genetic engineering and biosafety measures.

(d) With a neat labelled diagram explain the somatic embryogenesis technique.

(e) What is cryopreservation ? Write its advantage and disadvantage.

- (f) Write an explanatory note on cDNA library.
- (g) What is artificial seed? Draw and describe the different parts of an artificial seed.
- (h) How a piece of foreign gene is inserted into non-essential region of T-DNA during gene transfer? Explain.
- (i) Write an explanatory note on androgenesis technique with suitable diagram.

4. Answer the following questions : **(any two)**
10×2=20

- (a) With a neat labelled diagram write the steps of recombinant DNA process. Mention the principles that are fixed with genetic engineering. 3+4+3=10
- (b) What is gene transfer? Describe *any two* direct gene transfer methods with suitable diagram. 1+5+4=10
- (c) What is micropropagation? Describe how different chemicals are used to make a suitable nutrient medium. Give a list of growth regulators which are used in MS media. 2+6+2=10

- (d) Describe the role of transgenic crops with improved quality trait using it popularly in modern cultivation.
-