LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **PLANT BIOLOGY AND PLANT BIOTECHNOLOGY**

SIXTH SEMESTER – **APRIL 2024**

UPB 6501 – PLANT BIOTECHNOLOGY

Date: 05-04-2024 Dept. No. Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

	SECTION A - K1 (CO1)
	Answer ALL the Questions **(10 x 1 = 10)**
1.	**Fill in the blanks**
a)	…… is the father of plant tissue culture.
b)	The pigment …… is found in the nitrogen fixing root nodules of leguminous plants.
c)	Cauliflower Mosaic virus contains ……. as the genetic material.
d)	The cloning vector ……. has selectable markers for ampicillin and tetracycline resistance.
e)	Golden rice is rich in the pigment ……...
2.	**State whether the following statements are TRUE or FALSE**
a)	Calcium alginate is used for the production of artificial seeds.
b)	*Rhizobium* is a gram positive bacterium.
c)	Dot blot is a technique for detecting, analyzing and identifying proteins.
d)	The functional GUS gene produces blue colour in plants upon integration into plant genome.
e)	IPR is Indian Property Rights
	SECTION A - K2 (CO1)
	Answer ALL the Questions **(10 x 1 = 10)**
3.	**Choose the correct answer**
a)	Guha and Maheswari (1964) introduced the first haploid embryos by culturing the anthers of a) *Datura innoxia* b)*Datura metel* c)*Datura stramonium* d)Both b and c
b)	Frankia is associated with a) leguminous plants b) non leguminous plants c) both a and b d)none
c)	Who discovered the restriction enzyme? a) Werner Arber b) Daniel Nathans c) Hamilton O d)all the above
d)	Promoter sequences are a)located upstream b) at the 5' end c) sense strand d)all the above
e)	Which one of the following is the first produced transgenic plant? a) tobacco b) wheat c) tomato d) rice
4.	**Answer the following, each in about 50 words**
a)	Mention the importance of anther culture.
b)	What is special about *Arabidopsis thaliana*?
c)	Comment on shuttle vectors.
d)	Relate electroporation to gene transfer.
e)	Interpret the term SNP. Add a note on its types.
	SECTION B - K3 (CO2)
	Answer any TWO of the following in 500 words **(2 x 10 = 20)** **Draw diagrams / flowcharts wherever necessary**
5.	Chloroplast a semi -autonomous organelle - Justify.
6.	Experiment with the Sanger's method of DNA sequencing.
7.	Analyze the importance of marker genes and selectable markers.
8.	Enlist the various applications of plant molecular farming.

	SECTION C – K4 (CO3)
	Answer any TWO of the following in 500 words **(2 x 10 = 20)** **Draw diagrams / flowcharts wherever necessary**
9.	How to generate somatic hybrids using tissue culture?
10.	Infer and explain the role of nif genes in nitrogen metabolism.
11.	Distinguish between Southern and Western blotting methods.
12.	Simplify the mechanism of *Agrobacterium*-mediated DNA transfer and integration.
	SECTION D – K5 (CO4)
	Answer any ONE of the following in 1000 words **(1 x 20 = 20)** **Draw diagrams / flowcharts wherever necessary**
13.	Compare the post transcriptional and translational modifications in plants.
14.	Evaluate the implications of PCR technique.
	SECTION E – K6 (CO5)
	Answer any ONE of the following in 1000 words **(1 x 20 = 20)** **Draw diagrams / flowcharts wherever necessary**
15.	Differentiate between biolistics method and microinjection technique.
16.	Elaborate on the applications of a)RFLP and b)RAPD.

##########