	Utech
Name:	
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Invigilator's Signature :	

CS/M.Tech(BT)/SEM-1/MBT-103/2010-11 2010-11

ADVANCED PLANT BIOTECHNOLOGY

Full Marks: 70 Time Allotted: 3 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP - A

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(Multiple Choice Type Questions)							
1.	Cho	oose the correct alternatives for any <i>ten</i> of the following :					
					$10 \times 1 = 10$		
	i)	Haploid plants can be made diploid by the application of					
		a)	digoxin	b)	shikonin		
		c)	vinblastin	d)	gibberellins.		
	ii)	Dicer is a type of					
		a)	protease	b)	cellulase		
		c)	ribonuclease	d)	polymerase.		
	iii)	The	e site of synthesis	of cytokinin	in a plant is/are		

shoot apex a) root b)

developing seeds c)

d) all of these.

Single-stranded T-DNA from Ti plasmid if produced by the action of which of the following gene products?

a) chvA and chvB

VirD1 and VirD2 b)

VirE1 and VirE2 c)

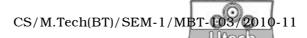
none of these. d)

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	inhi	bition of		As Philosophy of Experience and Experience	
	a)	glutamate dehydrogena	ase	O Charley III	
	b)	EPSPS			
	c)	glutamine synthase			
	d)	glucose 6-P dehydroge	nase.		
vi)		ch of the following reacconding maximum a		s the principal biotech or cultivation?	
	a)	Cotton	b)	Canola	
	c)	Maize	d)	Soybean.	
vii) Which one of the following is widely used as pigment in various industries?					
	a)	Berberine	b)	Serpentine	
	c)	Shikonin	d)	Digoxin.	
viii)	viii) Manipulation of golden rice requires the introduct the gene				
	a)	lycopene synthase	b)	lycopene β -cyclase	
	c)	lycopene desaturase	d)	lycopene oxidase.	
ix) Introduction of designed gene constructs into homologous recombination results in					
a) targeted disruption of a chosen gene					
	b) gene replacement				
	c)	gene therapy			
	d)	all of these.			
x)	x) Principal compound of Glyphosate is				
	a)	glycine	b)	glutamic acid	
	c)	alanine	d)	ascorbic acid.	
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v) The herbicidal action of Glyphosate is due to



- xi) Which position India occupies in terms of growing GM crops?
 - a) Third

b) Fourth

c) Fifth

- d) Sixth.
- xii) Which GM crop is most widely grown all over the world ?
 - a) Glyphosate-resistant soybean
 - b) Glyphosate-resistant canola
 - c) Basta-resistant soybean
 - d) Basta-resistant maize.

GROUP - B

(Short Answer Type Questions)

Answer any three of the following.

 $3 \times 5 = 15$

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- 2. What are the different virulence genes present in the Ti plasmid. Mention the function of any two gene products involved in the transfer of T-DNA into the host plant. 2+3
- 3. Briefly describe the contribution of G. Haberlandt and F. Skoog in the development of plant tissue culture. $2\frac{1}{2}+2\frac{1}{2}$
- 4. Give a brief account of DNA microarray.
- 5. What do you mean by reporter genes? Describe the mode of action of any such reporter gene. 2 + 3
- 6. What are the oncogenes present in the T-DNA of Ti plasmid? What are the reactions catalyzed by their products. 2 + 3

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GROUP - C

(Long Answer Type Questions)

Answer any three of the following.



- 7. a) What are the tissue culture techniques you would follow for conservation of elite Germplasm? Justify your statement.
 - b) Give an outline of any such technique for germplasm conservation.
 - c) Mention the importance of Androgenesis in plant breeding programme. 6+5+4
- 8. a) Explain the phenomenon that led to the production of white flowers due to the introduction of extra copies of chalcone synthase gene into petunia.
 - b) Elaborate the role of calmodulin and IP3 in plant cell signaling process. 8 + 7
- 9. a) Briefly describe the gene gun method for delivery of foreign DNA into plant cells. Comment on the merits of the method.
 - b) Explain how the candidate gene approach can act as a powerful tool for studying the genetic architecture of complex traits. 5 + 3 + 7
- 10. a) What is terminator technology? What are the possible advantages and disadvantages of using this technology?
 - b) Describe a case study for engineering Basta-resistance in crop plant. 3 + 6 + 6
- 11. Write short notes on any *two* of the following : $2 \times 7\frac{1}{2}$

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- a) Genetic engineering for salt resistance in plants
- b) Artificial seed
- c) Plastid engineering.

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