



## GIET UNIVERSITY, GUNUPUR – 765022

B. Sc (AG) (Second Semester) Examinations, October – 2021

### ABT-121 – Fundamentals of Plant Biotechnology

Time: 2 hrs

Maximum : 50 Marks

**The figures in the right hand margin indicate marks.**

#### PART – A

**Q.1. Fill in the blanks with suitable word / figure.**

(0.5 x 10 = 5 Marks)

- The MS-nutrient media in 'in-vitro' culture was developed by.....
- In tissue culture, auxins have been used for ..... differentiation.
- A part of the plant used for culturing is called.....
- ..... can be produced by the fusion of protoplasts from diverse species.
- DNA ligase joins the DNA molecule covalently by formation of .....bonds between adjacent nucleotides.
- The pUC19 plasmid was created by .....
- The biolistic gun for gene transfer uses.....metal as microprojectile particles.
- Flavr-Savr™ is the GM variety of .....
- Full form of RFLP is .....
- HindIII is a ..... enzyme.

**Q.2. Define (or) Explain the following in one or two sentences.**

(1 x 5 = 5 Marks)

- Totipotency
- Micro-propagation
- Artificial seeds
- Embryo rescue
- Electroporation

**Q3. Match COLUMN-A with COLUMN-B**

(0.5 x 10 = 5 Marks)

Column – A		Column – B	
(a)	Bioinformatics	(i)	Kary Mullis
(b)	Meristem Culture	(ii)	Bolivar and Rodriguez
(c)	PCR Invention	(iii)	Tobacco Mosaic Virus
(d)	Sucrose	(iv)	Crown gall
(e)	Gene gun	(v)	Biological data Digitalization
(f)	Restriction enzymes	(vi)	E. coli
(g)	DNA ligase	(vii)	Type II
(h)	pBR322	(viii)	Helium gas
(i)	Vectorless	(ix)	Germplasm conservation
(j)	Agrobacterium	(x)	Carbon source

**Q4. Write True or False against each statement**

**(0.5 x 10 = 5 Marks)**

- a. The concept of Gene Revolution was postulated to increase quality and quantity of food produce.
- b. Total eight macronutrients are required by the plants for growth and development.
- c. Competency is the ability of undifferentiated plant tissues to differentiate into functional plants when cultured *in vitro*.
- d. Plants in culture usually cannot meet their needs for fixed carbon. Usually added as sucrose at 2-3% w/v.
- e. The change in genetic make up during Genetic engineering occurs sequentially in three steps as integration, expression and transfer.
- f. The nomenclature of restriction enzymes was proposed by Smith and Nattens
- g. The restriction enzymes used widely in rDNA technology is Type III
- h. The enzyme responsible for removal of phosphate group from the DNA is Alkaline phosphatases
- i. Cloning vectors used in rDNA technology should possess autonomous replication (ori).
- j. Vir region of T-DNA is responsible for tumour induction.

**PART – B**

**Attempt ANY FIVE questions. All question carry equal marks.**

**(6 x 5 = 30 Marks)**

5. Name the two 'in-vitro route' of regeneration. Elucidate with diagram the in-vitro route of 'organogenesis' in regeneration of tissue culture plant with help of flow chart?
6. Define pollen culture? Name the person responsible for its discovery and importance of adopting this culture?
7. What is somaclonal variations and why they arise in tissue cultured plants? Give examples of somaclones.
8. What is r-DNA Technology? Explain different types of physical gene transfer methods?
9. Define "Transgenic plants"? Explain status of transgenic crops in India and distinguish between their advantages and disadvantages?
10. Define Markers? What are the different types of markers used in agriculture?

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