

**4 SEM TDC GEBTC (CBCS) 4**

**2025**

( May/June )



**BIOTECHNOLOGY**

( Generic Elective )

Paper : GE-4

( **Cell and Tissue Culture** )

*Full Marks : 53*

*Pass Marks : 21*

*Time : 3 hours*

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

1. Choose the correct answer : 1×5=5

(a) Which of the following is a commonly used basal medium in plant tissue culture?

- (i) DMEM
- (ii) MS medium
- (iii) RPMI-1640
- (iv) LB broth



(b) What is the primary advantage of somatic embryogenesis in plant tissue culture?

- (i) Increased seed size
- (ii) High genetic variation
- (iii) Clonal propagation
- (iv) Production of triploids

(c) Artificial seeds are produced using

- (i) embryo culture
- (ii) somatic embryos
- (iii) meristem culture
- (iv) protoplast fusion

(d) Haploid plants can be produced through

- (i) anther culture
- (ii) somatic embryogenesis
- (iii) callus culture
- (iv) protoplast culture

(e) Hybridoma technology is primarily used for the production of

- (i) stem cells
- (ii) insulin
- (iii) monoclonal antibodies
- (iv) interferons

2. Write short notes on any *three* of the following : 4×3=12

- (a) Callus culture
- (b) Artificial seed
- (c) Applications of plant tissue culture in industry
- (d) In vitro fertilization
- (e) Cryopreservation

3. Answer any *three* of the following questions : 5×3=15

- (a) Differentiate between somatic embryogenesis and organogenesis.
- (b) Explain the role of plant growth regulators in tissue culture.
- (c) Describe the techniques used for germplasm conservation.
- (d) What are the potential applications of stem cell research in medicine?
- (e) What is triploid production? Explain its application in plant breeding. 2+3=5



4. Answer any *three* of the following questions :

7×3=21

- (a) Describe the applications of animal cell culture in medicine and biotechnology.  
3+4=7
- (b) What is somatic hybridization? Write some applications of somatic hybridization.  
2+5=7
- (c) Describe androgenesis and its application.  
3+4=7
- (d) Explain the role of macro- and micro-nutrients in plant tissue culture.
- (e) What are the advantages and limitations of micropropagation?  
4+3=7

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