Printed Page:-03 **Subject Code:- AMTBT0204**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.Tech

SEM: II - THEORY EXAMINATION (2023 - 2024)

Subject: Cell &Tissue Culture Techniques

Time: 3 Hours **Max. Marks: 70**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* ***three Sections -A, B, & C.*** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION A 15

1. Attempt all parts:-

1-a. pH of culture medium is initially controlled by (CO1) 1

(a) presence of CO2

(b) presence of bicarbonate buffer

(c) addition of bases

(d) none of these

1-b. The process of dedifferentiation in cell culture can give rise to _____(CO1) 1

(a) induced-pluripotent stem cells

(b) carcinoma cells

(c) single protoplasts

(d) fused protoplasts

1-c. . If a gene is inactivated by gene targeting then it is called as _____(CO1) 1

(a) knock-in gene

(b) knock-out gene

(c) gene disruption

(d) insertional inactivation

1-d. The modification of exogenous compounds by plant cells is called (CO1) 1

(a) Biotransformation

(b) bioconversion

(c) both a and b

(d) biophytomodification

1-e. Genetic variation observed in callus obtained from tissue culture is called (CO1) 1

(a) morphogenesis

(b) rhizogenesis

(c) callogenesis

(d) somaclonal variation

2. Attempt all parts:-

2.a.	What are balanced salt solutions and conditioned media? Give examples. (CO1)	2
2.b.	What is organotypic culture?.(CO2)	2
2.c.	Give two examples of vaccine produced by animal cell culture approach. (CO3)	2
2.d.	Explain the fundamentals of plant tissue culture. (CO4)	2
2.e.	What is the significance of pollen culture? (CO5)	2

SECTION B **20**

3. Answer any five of the following:-

3-a.	Describe the process of regulation of pH, temperature and osmolarity of media. (CO1)	4
3-b.	Describe different types of culture media. Explain important regulating factor of media. (CO1)	4
3-c.	Explain the method of cell separation based on cell surface charge. (CO2)	4
3-d.	Discuss the important features of cell culture and cell lines. (CO2)	4
3.e.	What are major parameters considered for embryonic stem cell culture? Discuss various applications of embryonic cell culture. (CO3)	4
3.f.	How somatic embryogenesis is different from zygotic embryogenesis. (CO4)	4
3.g.	What factors must be considered for selection explant? What are the major difficulties in plant tissue culture method? (CO5)	4

SECTION C **35**

4. Answer any one of the following:-

4-a.	Explain how excess of foam formation is dealt with in the bioreactor and how pH is controlled in order to obtain maximum growth in optimal conditions? (CO1)	7
4-b.	Please elaborate what are the key requirements for mammalian cells to grow and culture and how are these requirements fulfilled? (CO1)	7

5. Answer any one of the following:-

5-a.	What is the purpose of cell separation in cell culture and its applications? (CO2)	7
5-b.	Give a descriptive account of importance and function of method of cell number estimation based on cell metabolism. (CO2)	7

6. Answer any one of the following:-

6-a.	Discuss various aspects of transformation using biological methods. (CO3)	7
6-b.	Describe the process of transformation by using different physical methods. (CO3)	7

7. Answer any one of the following:-

7-a.	How the biotechnology can help making a plant resilient to changing climatic conditions. (CO4)	7
7-b.	Based on the facts please explain how transgenic plants can be the future of agriculture. (CO4)	7

8. Answer any one of the following:-

8-a.	How the haploid plant production can help in overcoming the malnutrition in the country. (CO5)	7
8-b.	A scientist is trying to produce a haploid plant for an elite plant species. What strategy will	7

help him in getting a fast result. Explain. (CO5)