Printed Page:- Subject Code:- AMTBT0217

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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.Tech.

SEM: II - THEORY EXAMINATION (2021 - 2022)

Subject: Cell & Tissue Culture Techniques

Time: 3 Hours Max. Marks: 70

General Instructions:

1. The question paper comprises three sections, A, B, and C. You are expected to answer them as directed.
2. Section A - Question No- 1 is 1 marker & Question No- 2 carries 2 marks each.
3. Section B - Question No-3 is based on external choice carrying 4 marks each.
4. Section C - Questions No. 4-8 are within unit choice questions carrying 7 marks each.
5. 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. In enzymatic disaggregation method, frequently used enzyme is (CO1) 1

(a) Trypsin

(b) Protease

(c) Collagenase

(d) DNase

1-b. Example of cryoprotective agent is…… (CO2) 1

(a) DMSO/Dimethylsulfoxide

(b) DMEM

(c) EDTA

(d) HEPES

1-c. Trypan blue dye easily incorporated inside the (CO3) 1

(a) live cells

(b) dead cells

(c) both 1 and 2

(d) none

1-d. The growth of plant tissues in artificial media is called_____ (CO4) 1

(a) Gene expression

(b) Transgenesis

(c) Plant tissue culture

(d) Cell hybridization

1-e. The variation in invitro culture is called as (CO5) 1

(a) invitro variation

(b) mutation

(c) somaclonal variation

(d) all of these

2. Attempt all parts:-

2.a. What is the significance of serum in culture media? (CO1) 2

2.b. Define the term trypsinization. (CO2) 2

2.c. What do you understand by monolayer culture? (CO3) 2

2.d. Name the common methods of plant regeneration. (CO4) 2

2.e. Why the vitamins and other organic supplements are used in the plant tissue culture medium? (CO5) 2

SECTION B 20

3. Answer any five of the following:-

3-a. Differentiate between serum free and serum containing media. (CO1) 4

3-b. Give a flow chart of explaining media preparation. (CO1) 4

3-c. Which type of precaution one should take during cell line maintenance? (CO2) 4

3-d. Differentiate between anchorage dependent and independent cell culture with examples. (CO2) 4

3.e. How will you identify transformed cell in cell culture on the basis of their characteristics? (CO3) 4

3.f. List four different types of culture media which are being used in plant tissue culture. (CO4) 4

3.g. Give the applications of callus culturing? How it can help in transgenic plant production? (CO5) 4

SECTION C 35

4. Answer any one of the following:-

4-a.	Explain the process of preparation and sterilization of cell culture media. (CO1)	7
4-b.	Explain natural and artificial media with examples. (CO1)	7

5. Answer any one of the following:-

5-a.	Write a note on steps involved in the establishment of primary culture. (CO2)	7
5-b.	Give a detailed account on procedure of organ culture. (CO2)	7

6. Answer any one of the following:-

6-a.	Discuss the viral based method used for transformation of cultured cells. (CO3)	7
6-b.	Discuss the process involved in production of pharmaceutical proteins by cell culture. (CO3)	7

7. Answer any one of the following:-

7-a.	What is micropropagation? Describe the different stages of micropropagation? (CO4)	7
7-b.	What are biotic and abiotic stresses? Explain the method of cell/callus line selection for resistance to stress. (CO4)	7

8. Answer any one of the following:-

8-a.	How tissue culture can help in plant improvement? Explain. (CO5)	7
8-b.	Give a detail classification of callus types. How the physicochemical conditions affects the callus culturing? (CO5)	7