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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 (2022-2023)

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. | For sub-culturing of adherent cell lines,used for detaching cells from their surface. (CO1) | 1 |
| | (a) DMSO | |
| | (b) Ethanol | |
| | (c) Trypsin | |
| | (d) Phenol red | |
| 1-b. | For culturing, plasma from the adult chicken is preferred to mammalian plasma because (CO2) | 1 |
| | (a) it forms a semi solid coagulum | |
| | (b) it is too opaque | |
| | (c) it doesn't produce solid clots | |
| | (d) it forms a clear and solid coagulum even after dilution | |
| 1-c. | Which of the following is not a type of basic T-Flask? (CO3) | 1 |
| | (a) T-25 | |

(b) T-55

(c) T-75

(d) T-175

1-d. Which of the following is best suited method for production of virus free plants (CO4) 1

(a) embryo culture

(b) meristem culture

(c) ovule culture

(d) anther culture

1-e. The name "Golden rice" is given to a rice variety because (CO5) 1

(a) it contains traces of gold

(b) it is obtained from areas where gold mining is done

(c) the seeds are golden yellow in colour because of the presence of β - carotene

(d) it is made of gold

2. Attempt all parts:-

2.a. What is chemically defined media and one example for it? (CO1) 2

2.b. Give a detailed note on media selection for cell culture. Give some examples of media selected for various cell lines. (CO2) 2

2.c. What is the cell cloning? (CO3) 2

2.d. Name any two mutagens used to induce variations in plants. (CO4) 2

2.e. What is gynogenesis? (CO5) 2

SECTION B

20

3. Answer any five of the following:-

3-a. What are the selection criteria of culture media and serum? (CO1) 4

3-b. What are three major developments in animal cell culture development? Explain the significance of each. (CO1) 4

3-c. Define the role of EDTA in trypsin solution. (CO2) 4

3-d. Explain the method of cell separation based on cell surface charge. (CO2) 4

3.e. Define stem cells and their important characteristics features. (CO3) 4

3.f. Write short note on protoplast fusion. (CO4) 4

3.g. What are the different requirements of plant tissue culture lab? Give a detail description of the requirements with justification of each. . (CO5) 4

4. Answer any one of the following:-

- 4-a. Discuss the effect of temperature, pH and CO₂ concentration on cell culture growth. (CO1) 7
- 4-b. How oxygen, CO₂ and temperature are regulated in cell culture? Describe the factors and process in detail. (CO1) 7

5. Answer any one of the following:-

- 5-a. What is secondary culture? Differentiate between finite and continuous cell lines with examples. (CO2) 7
- 5-b. Give a detailed note on procedure of estimation of cell number based on metabolic activity. (CO2) 7

6. Answer any one of the following:-

- 6-a. Explain the process of chicken kidney and liver culture in detail. (CO3) 7
- 6-b. What are different types of procedure used for the inactivation of microorganism under vaccine development methods? (CO3) 7

7. Answer any one of the following:-

- 7-a. What is the principle of plant tissue culture? (CO4) 7
- 7-b. How the somaclonal variants are Isolated? Explain the methods. (CO4) 7

8. Answer any one of the following:-

- 8-a. How plant tissue culture can help in increasing the farmer's income? (CO5) 7
- 8-b. What is an Explant? (CO5) 7