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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 (2024- 2025)

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. Range of optimum glucose concentration present in the culture media is (CO1, K1) 1
- (a) 5.5 – 55 mmol/litre
- (b) 55 – 75 mmol/litre
- (c) 75-105 mmol/litre
- (d) 105-150 mmol/litre
- 1-b. A growth curve gives three parameters of measurement: (CO2, K1) 1
- (a) Lag
- (b) log
- (c) stationary phase
- (d) all of the above
- 1-c. The detergent typically used for inactivation of microorganism is.....(CO3, K1) 1
- (a) Formalin
- (b) trypan blue
- (c) Triton-X 100
- (d) MTT
- 1-d. Name the enzyme which has silenced to delay the ripening process? (CO4, K1) 1
- (a) Polygalacturonase

(b) Glyphosate	
(c) ADA	
(d) P53	
1-e. Genetic variation observed in callus obtained from tissue culture is called (CO5, K1)	1
(a) morphogenesis	
(b) rhizogenesis	
(c) callogenesis	
(d) somaclonal variation	
2. Attempt all parts:-	
2.a. What are trace elements in media? (CO1, K2)	2
2.b. Define suspension cell culture with examples. (CO2, K2)	2
2.c. Give two examples of pharmaceutical proteins. (CO3, K2)	2
2.d. What is genetic fidelity? (CO4, K2)	2
2.e. What is synthetic seed? (CO5, K2)	2
SECTION-B	20
3. Answer any <u>five</u> of the following:-	
3-a. Use of trypsin considered as major development in cell culture. Explain. (CO1, K3)	4
3-b. Differentiate between serum free and serum containing media. (CO1, K3)	4
3-c. What are major parameters considered for cell line characterization? (CO2, K3)	4
3-d. Describe the process of embryo fibroblast culture. (CO2, K3)	4
3.e. Explain the method of production of pharmaceutical proteins using cell culture. (CO3, K3)	4
3.f. Write short note on protoplast fusion. (CO4, K3)	4
3.g. What factors affects the growth and development of in vitro cultures? (CO5, K3)	4
SECTION-C	35
4. Answer any <u>one</u> of the following:-	
4-a. What is balanced salt solution? Explain the various components and importance of BSS. (CO1, K3)	7
4-b. What is basic cell culture technique from isolation of tissue or organ to development of cell lines? (CO1, K3)	7
5. Answer any <u>one</u> of the following:-	
5-a. Discuss various aspects of cell growth pattern in cell culture media. (CO2, K3)	7
5-b. Explain the process of development of primary cell line. What are different subtypes of primary cell culture? (CO2, K3)	7
6. Answer any <u>one</u> of the following:-	
6-a. Define vaccine. Give a detailed account on production of animal vaccines by using	7

cell culture. (CO3, K3)

6-b. What is transfection? Describe the different process of transfection in animal cell culture. (CO3, K3) 7

7. Answer any one of the following:-

7-a. What is cell line selection? Explain the method of Cell/callus line selection for resistance to herbicide. (CO4, K3) 7

7-b. What is the agronomic usefulness of somaclonal variation? (CO4, K3) 7

8. Answer any one of the following:-

8-a. How will you produce a plant from an explant? Give the diagrammatic explanation. (CO5, K4) 7

8-b. How tissue culture can help in plant improvement? Explain. (CO5, K4) 7

REG:JAN_JUN-2025