# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION – **FOOD CHEMISTRY AND FOOD PROCESSING**

THIRD SEMESTER – **NOVEMBER 2023**

**PFP3ID01 – FOOD BIOTECHNOLOGY**

Date: 09-11-2023 Dept. No. Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

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| | **SECTION A – K1 (CO1)** |
| | **Answer ALL the questions** **(5 x 1 = 5)** |
| **1** | **Multiple Choice Questions** |
| a) | Which of the following is a type of Submerged Fermentation?<br>i) laboratory scale SSF bioreactor ii) solid-state fermentation<br>iii) stirred tank bioreactor iv) industrial scale SSF bioreactor |
| b) | What is the purpose of sterilization in the fermentation process?<br>i) to increase agitation ii) to remove oxygen<br>iii)to eliminate unwanted microorganisms iv) to enhance aeration |
| c) | Edible vaccines act by the process of<br>i) function encapsulation ii) class encapsulation<br>iii) bioencapsulation iv) act encapsulation |
| d) | To clone into a plasmid vector, both the plasmid and the foreign DNA are cut with the<br>i) same restriction enzyme and mixed together<br>ii) different restriction enzyme and mixed together<br>iii) combination of enzymes and then seoerated<br>iv) combination of enzymes and mixed together |
| e) | Which of the following is an example of head-and-tail bacteriophage?<br>i) M13 ii) Lambda phage iii) Pbr322 iv) M16 |
| | **SECTION A – K2 (CO1)** |
| | **Answer ALL the questions** **(5 x 1 = 5)** |
| 2 | **Answer in one or two sentences** |
| a) | How do submerged and solid-state fermentations differ in their processes? |
| b) | Define Reverse osmosis |
| c) | Write any two potential uses of using microbes in the biotransformation process. |
| d) | Write a note on rBST. |
| e) | What is FISH technique.? |
| | **SECTION B – K3 (CO2)** |
| | **Answer any THREE of the following** **(3 x 10 = 30)** |
| 3. | Explain the techniques used for the separation of insoluble products from the bioreactor. |
| 4 | Discuss the concepts of scale up and scale down. |
| 5 | Explain the pivotal role of microbial and plant cells in biotransformation processes. |
| 6 | Explain the implications of rDNA technology is used in the production of the Calgene Flavr Savr GM tomato. |

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| 7 | Describe the quantum techniques involved in the diagnosis of food pathogens. |
| | **SECTION C – K4 (CO3)** |
| | **Answer any TWO of the following** **(2 x 12.5 = 25)** |
| 8 | Describe the key steps involved in the design of a biotransformation process, emphasizing the selection of microorganisms. |
| 9 | Discuss the key factors that need to be considered during the stages of upstream and downstream processing to ensure optimal fermentation outcomes |
| 10 | Explain the recombinant DNA technology and how to improve nutritionally rich crop production. |
| 11 | Write the principle and function of the RAPD nucleic acid polymerase chain reaction. |
| | **SECTION D – K5 (CO4)** |
| | **Answer any ONE of the following** **(1 x 15 = 15)** |
| 12 | Discuss the chromatographic and electrophoretic techniques used for separating soluble products from the fermentor tank. |
| 13 | Write about the applications of biosensors and their importance in various diagnostic methods. |
| | **SECTION E – K6 (CO5)** |
| | **Answer any ONE of the following** **(1 x 20 = 20)** |
| 14 | Explain the various types of submerged fermentation system with suitable illustrations |
| 15 | Discuss the DNA microarray technology used for studying food-borne pathogens and microbial habitats in food preservation. |

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