Total number of printed pages: 02

Programme (UG)/4th Semester/UFET404

2024

Food Microbiology and Food Biotechnology

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

*Answer **ANY FIVE** questions.*

1.	a)	What is "genetically modified (GM)" food? Elaborate on application of Ti-plasmid for development of genetically engineered "golden" rice – Use a schematic diagram to enrich your answer.	2 + 10
	b)	Detail sauerkraut fermentation by *Lactobacillus plantarum* and by *Leuconostoc mesenteroides*. What is "cheddaring", and what is its significance in cheddar cheese processing.	5 + 3
2.	a)	Describe how microbial survival and growth depends on – (i) water activity and (ii) pH of the surroundings	5 + 5
	b)	Describe homofermentative lactic acid fermentation using a flow-diagram. What is the difference between homo- and heterolactic fermentations?	8 + 2
3.	a)	What are the three modes of foodborne disease? Explain each with an example. What is "etiology" of a foodborne disease – Give an example?	8 + 2
	b)	Elaborate on processing flow-diagram of fermented sausage. What is the significance of the step "stuffing" in this process?	8 + 2
4.	a)	What is the major difference between milk coagulations in yogurt and cheese. Elaborate on the following three components of rDNA technology – (i) restriction enzyme, (ii) cloning vector, and (iii) ligation.	2 + 8
	b)	Define "foodborne outbreak". What is "shigellosis" infection, and name a pathogen that causes this infection? List four major characteristics of the pathogen. What is the toxin produced by the pathogen, and what are the symptoms of this infection? What are the common food vehicles responsible for causing shigellosis?	2 + 2 + 2 + 2 + 2
5.	a)	What is transduction? Elaborate the translation process that occurs in cell ribosome – Use a schematic diagram in your elaboration.	2 + 8
	b)	What is "Koumiss"? Describe on the process flow-diagram for koumiss.	2 + 8

6.	a)	Write short-notes on **any four** of the following. (i) Diacetyle flavor, (ii) Toxicoinfection, (iii) Unripened cheese, (iv) Humulin, (v) Cider vinegar	4 × 2.5
	b)	Give the reaction scheme for acetic acid fermentation along with the enzymes that catalyze the biochemical process. Name any two bacterial starter culture commonly used for acetic acid fermentation. What is the primary difference between "table vinegar" and "pickling vinegar"?	4 + 2 + 1
	c)	List three major purposes of applying genetic engineering in agriculture / food production.	3