Total number of printed pages: **Programme (UG) / 4th Semester / UFET404**

2023

Food Microbiology and Food Biotechnology

Full Mark: 100

Time: Three hours

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

*Answer **ANY FIVE** questions.*

1.	a)	What is genetic engineering? Explain how Ti plasmid is commonly used to develop "Golden rice" variety – Use a schematic diagram to enrich your explanation.	2 + 10
	b)	Briefly discuss different types of microorganisms based on their ability to survive and/or grow in presence / absence of oxygen. Give an example for each type.	5
	c)	Who discovered rDNA technology? What was the first transgenic product approved for human use?	2 + 1
2.	a)	Write short notes on ***any two*** of – (i) Propionic acid fermentation in Swiss cheese, (ii) Translation process in ribosome, (iii) Malting in beer processing	2 × 5
	a)	Elaborate homolactic fermentation using a flow-diagram showing the sequence of biochemical reactions?	10
3.	a)	Define ***any five*** of the following. (i) Foodborne outbreak, (ii) Symptom, (iii) Foodborne infection, (iv) Cloning vector, (v) Transcription, (vi) Transduction	2 × 5
	b)	Give the following details on aflatoxicosis. (i) Pathogens responsible, (ii) Common food vehicles, (iii) Acute aflatoxicosis (iv) Chronic aflatoxicosis, (v) Major toxins and their tolerable limit	2 × 5
4.	a)	How do the nitrite and/or nitrate salts help in color development of sausages? What is meat emulsion? What is the significance of "stuffing" meat emulsion in casings during sausage manufacturing?	5 + 2 + 2
	b)	Elaborate the process flow-diagram of cheddar cheese manufacturing.	11
5.	a)	What is the function of sulphite (SO_2) in wine? Describe malolactic fermentation in wine.	2 + 5
	b)	Describe the maceration / crushing and alcoholic fermentation steps in wine processing.	10
	c)	Why is Entner-Doudoroff pathway also termed as KDPG pathway? Name **four** common sources of pathogenic contamination in food	1 + 2
6.	a)	What is the substrate in sauerkraut fermentation? Describe the detail sequence of microbial activities in this fermentation.	1 + 5

	b)	Describe psychrophiles, thermophiles and mesophiles with an example for each.	7
	c)	What are the structural genes of *lac* operon, and what are their functions? What is the difference between genetic engineering and selective breeding?	5 + 2