*Total number of printed pages: 01* **Programme (PG)/2nd Semester/MFE201**

**2025**

# Emerging Food Processing Technologies-I: Beverages and Dairy

*Full Marks: 100*

Time: Three hours

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

*Answer* **ANY FIVE** *questions.*

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| 1. | a) | Briefly elaborate on the four major properties desired in starter culture microorganisms. What are the major differences between drip coffee and expresso? What is "coffee wax"? | 6 + 2 + 2 |
| | b) | How does chymosin catalyzes milk coagulation during cheese manufacturing – Explain with a schematic diagram. Enlist **four** major differences between frozen and lyophilized starter cultures. | 6 + 4 |
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| 2. | a) | Write short notes on **any five** of the following. (i) Premiumization, (ii) Functionality, (iii) Pitting in fruit juice processing, (iv) Pitching in beer, (v) Must, (vi) Mustiness in tea | 5 × 2 |
| | b) | Elaborate on the principle and preservation of fruit juice using pulsed electric field (PEF). What is "albedo" of a citrus fruit, and what are its nutritional importance (if any)? | 8 + 2 |
| | | | |
| 3. | a) | Explain fruit juice concentration by reverse osmosis process – Use an appropriately labeled schematic diagram. What are the two major varieties of coffee commonly consumed worldwide. | 6 + 2 |
| | b) | Draw a schematic flow-diagram to describe processing of "instant" coffee. appropriately. Briefly discuss "hops" in beer. | 8 + 4 |
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| 4. | a) | Elaborate on withering (use a schematic diagram of a continuous withering line), maceration and fermentation of tea leaves. | 14 |
| | b) | What is CTC grade tea? List **two** major differences and **two** major similarities between squash and cordial. | 2 + 4 |
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| 5. | a) | How Le Chatelier's principle is applied in high pressure processing of foods? Elaborate on the principle of fruit juice preservation by ultrasonication using a schematic diagram. | 2 + 7 |
| | b) | Elaborate on malolactic fermentation in wine using the reaction scheme for the biochemical process. Discuss cold plasma technology applied for food preservation – Use a schematic diagram to enrich your discussion. | 4 + 7 |
| | | | |
| 6. | a) | Explain each of the following principle of reduction of membrane fouling by – (i) modification in membrane processing conditions, and by (ii) modification in membrane surface characteristics. | 4 + 5 |
| | b) | List four major effects of γ-irradiation on fruit juice quality. Define permeate flux, and its mathematical expression. What is "malting" in beer processing – Elaborate. | 4 + 2 + 5 |