

2024  
2nd Sem.



Department of Food Technology  
School of Interdisciplinary Sciences and Technology

Jamia Hamdard, New Delhi-110062

END SEMESTER EXAMINATION-May 2024

(M.Tech Food Technology-Semester II)

Paper Title: Dairy Technology & Engineering; Paper Code: MFTC-204

Roll No.....

Time allotted: 3Hrs

Max Marks: 60

Note: Section A is compulsory. Attempt any five questions from Section B. Attempt any two questions from Section C. Do not write anything on the question paper.

**Section-A (Attempt All)**

Q1. Match options in Column A with the most appropriate option in Column B: (4)

| (A) Type of Pump | (B) Application/Purpose  |
|------------------|--------------------------|
| Centrifugal pump | Shear-sensitive products |
| Piston pump      | Cream Separation         |
| Jet pump         | High viscosity products  |
| Lobe pump        | Lift water to the boiler |

Q2. Multiple Choice Questions: (5)

A. If you want to make butter from cream and want to store it for longer period, then the acidity of the cream should be reduced to \_\_\_\_\_ % before churning.

- a. 0.06                      b. 0.12                      c. 0.25                      d. 0.36

B. What is the effect of feeding green fodder to dairy cows on their milk?

- a. Increases riboflavin    b. Decreases riboflavin    c. No impact    d. Increases fat content

C. What instrument is commonly used to measure the specific gravity of milk?

- a. Barometer              b. Refractometer              c. Lactometer              d. Pycnometer

D. What ingredient is primarily responsible for preventing large ice crystals from forming in ice cream, thus contributing to its smooth texture?

- a. Liquid Nitrogen    b. Egg yolk                      c. Chitosan                      d. Sugar

E. As per FSSAI, the maximum amount of common salt in butter should be:

- a. 1%                      b. 3%                      c. 5%                      d. 7%

Q3. Differentiate between COP and CIP. (2)

Q4. Define the following: Homogenization, Green cheese (2)

Q5. Condensed milk contains 31 % TMS and 43.1 % added sugar. What is the sugar ratio? (2)

**Section- B (Attempt any 5) (6 Marks Each)**

Q1. Differentiate between freezing and hardening of ice cream. State the role of stabilizers and emulsifiers in ice cream manufacture with examples.

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- Q2.** What is the time-temperature combination for batch pasteurization of milk? Draw the continuous milk pasteurizer and identify its various components.
- Q3.** Explain manufacturing of Cheddar cheese.
- Q4.** State Stoke's law and its relevance to creaming. Define Cream as per standards.
- Q5.** 500 L of milk testing (6.5 % Fat and 9.0 % SNF) is to be standardized to 1.5 % fat using skim milk containing 0.01 % fat. Calculate the quantity of whole milk as well as skim milk required for this standardization.
- Q6.** Give a brief account of the various platform tests and mention principle and procedure for alkaline phosphatase test.

### **Section C (Attempt any 2) (12.5 Marks Each)**

- Q1.** Explain theories of butter churning. What is the ideal temperature range for the churning of butter? Mention merits and demerits of metal butter churns. Further solve: 1200 kgs of cream containing 40% fat was churned into 576 Kgs of butter. Calculate the overrun % in butter.
- Q2.** Discuss the spray drying process used for milk, focusing on the principle of operation, the types of atomizers employed, methods for recovering fines, and the limitations of the process. Draw diagram for a spray drying system.
- Q3.** What is khoa? Mention types. Discuss the continuous method of preparation of khoa and any one khoa based sweet. State the reasons for burnt and oxidized flavour in khoa and khoa based sweets.

#### **CO-PO Mapping:**

| Section A |                        | Section B |                    | Section C |                    |
|-----------|------------------------|-----------|--------------------|-----------|--------------------|
| Q1        | CO3, PO3, PO2          | Q1        | CO2, CO1, PO2      | Q1        | CO1, CO2, PO1, PO3 |
| Q2        | CO1, 2, 3, 4; PO2, PO4 | Q2        | CO1, CO4, PO3, PO6 | Q2        | CO1, CO4, PO2, PO3 |
| Q3        | CO1, PO2               | Q3        | CO1, CO2, PO2      | Q3        | CO2, PO1, PO2      |
| Q4        | CO2, CO3, PO5          | Q4        | CO2, PO2, PO3      | -         | -                  |
| Q5        | CO2, PO4               | Q5        | CO1, PO2, PO4      | -         | -                  |
| Q6        | -                      | Q6        | CO1, PO1           | -         | -                  |

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