

**MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR**  
**SEMESTER END THEORY EXAMINATION, B.Tech. (D. T.)**

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|------------|----------------------|---------------|-------------------------|
| Semester   | : V (V Dean)         | Academic Year | : 2023-2024             |
| Course No. | : DT-507             | Course Title  | : By Product Technology |
| Credits    | : (2+1=3)            | Total Marks   | : 50                    |
| Day & Date | : Monday, 13/05/2024 | Time          | : 2 hours               |

- Note :**
- 1) All questions from **Section 'A'** are compulsory.
  - 2) Solve **Any Three** questions from **Section 'B'**.
  - 3) Draw neat and well labelled diagram wherever necessary.

**SECTION –‘A’**

Q. 1 A) Choose the most appropriate answer from the options given below. (05 )

- i) The pH of sweet whey ranges between .....
  - a) 5.0 -5.6
  - b) 5.8 -6.6
  - c) 3.5 -4.5
  - d) 4.5 -5.5
- ii) Rennet coagulates casein present in milk into para-casein in the presence of .....
  - a) Na salts
  - b) Mg salts
  - c) K salts
  - d) Ca salts
- iii) Presence of excess fat in casein during drying may result in .....
  - a) Browning
  - b) High adhesive strength
  - c) Low adhesive strength
  - d) All
- iv) The yield of edible acid casein from skim milk is about .....
  - a) 2.5 kg/100 kg
  - b) 3 kg/100 kg
  - c) 3.5 kg/100 kg
  - d) 2 kg/100 kg
- v) The total solid content of sodium caseinate solution for spray drying is .....
  - a) 14-16%
  - b) 18-20%
  - c) 20-22%
  - d) 26-28%

B) Define the following. (05 )

- i) Caseinate
- ii) Co-precipitates
- iii) Diltration
- iv) Hydrolysates
- v) Electrodialysis

Q. 2 A) Give reasons for the following. (05 )

- i) Temperature of coagulation is fixed to 40°C during manufacturing of casein.
- ii) Cheese whey is sweeter than paneer whey.
- iii) The yield of casein from skim 3 kg/100 kg.
- iv) Co-precipitate comprises of both casein and whey protein.
- v) Seeding is done during the manufacture of crude lactose industrially.

..2..

- B) State whether True or False. If false, rewrite the statement after making necessary corrections in the underlined words. (05 )
- Size of the Lactose crystals should not be more than 20 micron.
  - The rate of denaturation of alpha lactalbumin is of first order.
  - Whey protein isolate has more than 50% whey protein.
  - Beta- lactose is sweeter and less soluble than alpha -hydrate.
  - Ricotta cheese is a product of American origin.

## SECTION – 'B'

- Q. 3 A. What are different types of commercial casein? Write down the uses of casein. (05 )
- B. Describe the industrial production of acid and rennet casein with flow diagram. (05 )
- Q. 4 A. Discuss the application of membrane processing for whey processing. (05 )
- B. What is co-precipitate? Describe the production of sodium caseinate. (05 )
- Q. 5 A. Write down three grades of lactose with its specification. (03 )
- B. Differentiate between acid casein and rennet casein. (03 )
- C. Describe the manufacturing of crude lactose from whey with its flow chart. (04 )
- Q. 6 A. Write the different method of hydrolysis of lactose and uses of lactose. (03 )
- B. Briefly discuss physico-chemical characteristics of whey and butter milk. (03 )
- C. Explain in brief *Ghee residue* and its composition, processing and utilization. (04 )
- Q. 7 Status, availability and utilization of dairy by-products in India and Abroad. Discuss the economic and pollution problems associated with by-product utilization. Enlight how to reduce them. (10 )

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