

**MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR**  
**SEMEISTER END THEORY EXAMINATION, B. Tech. Dairy Technology 2019-20**

Semester	: V (V Dean)	Academic Year	: 2019-2020
Course No.	: DT - 507	Course Title	: By Product Technology
Credits	: 2+1=3	Total Marks	: 50
Day & Date	: Wednesday, 15.01.2020	Time	: 11.00 to 13.00 Hrs.

- 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 yield of Rennet casein is .....
  - a) 3.2 to 3.4 %
  - b) 2.8 to 3.2 %
  - c) 2.4 to 2.8 %
  - d) 2.0 to 2.4 %
- ii) The heat treatment given to milk for high-calcium co-precipitate is .....
  - a) 90°C/30 min
  - b) 90°C /20 min
  - c) 90°C /10 min
  - d) 90°C / 2 min
- iii) A minor constituent of Cheese whey is .....
  - a) Water
  - b) Lactose
  - c) Whey protein
  - d) Milk salts
- iv) Casein has PER value .....
  - a) 1.5
  - b) 2.5
  - c) 3.5
  - d) 4.5
- v) Pasteurization of skim milk produces casein with .....
  - a) Reduce solubility
  - b) Increased solubility
  - c) Drastic reduce solubility
  - d) Drastic increase solubility

B) Define the following. (05)

- i) Plastein reaction
- ii) Co-precipitate
- iii) Electrodialysis
- iv) Ghee-residue
- v) Refracting index

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

- i) In the manufacture of caseinates, fresh acid casein curd is preferred over dried casein as raw material.
- ii) The mineral content is substantially lower in acid casein than rennet casein.
- iii) In manufacture of acid casein temperature below 35°C is not advisable.
- iv) In manufacture of dried sodium caseinate, total solid content of sodium caseinate is kept below 20%.
- v) In manufacture of high calcium co-precipitate 0.2%  $\text{CaCl}_2$  is injected into the hot milk and the temperature of the mixture is 77°C or higher.

(P.T.O.)

- B) State whether True or False, If False, rewrite the statement after making necessary corrections in underline words. (05)
- i) Calcium caseinates are more soluble and have better functional attributes than sodium caseinate.
  - ii) High calcium co-precipitate curds are produced from skim milk heated at pH 4.6 and minimum temperature is 77°C.
  - iii) With higher TS, the denaturation of  $\beta$ -Lacto globulin and  $\alpha$ -Lactal albumin slows down.
  - iv) The lactose crystal size must be kept below 10  $\mu$  to produce a smooth rather than sandy texture.
  - v) The lipids of ghee-residue have lower Reichert Meissl value and Polenske value, but higher Iodine value in comparison to those of corresponding ghee.

### SECTION - 'B'

- Q. 3 A) Define the term Dairy By-Products. Discuss the recent trends in utilization of dairy by-products in India. (05)
- B) Discuss the important functional properties of whey proteins. (05)
- Q. 4 A) Describe in detail 'electrodialysis process'. (05)
- B) Explain the principle of co-precipitates making. Classify the different co-precipitates used in food industry. (05)
- Q. 5 A) What is the significance of whey beverages? Write the flow-diagram for manufacture of whey based beverages with technical details. (03)
- B) Explain the utilization of lactose hydrolysis in dairy products. (03)
- C) Describe the different food uses of ghee residues. (04)
- Q. 6 A) Describe in brief, the process for manufacture of edible grade lactose. (03)
- B) Define/Explain the following terminology (any three): Flux, Fauting, Diafiltration, Concentration and Polarization. (03)
- C) Explain the importance of washing the curd in casein making. State the quality of water required for washing the curd. (04)
- Q. 7 Describe the enzymatic methods for production of protein- hydrolysates. List the uses of protein - hydrolysates in Food Industry. (10)

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