

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

Semester	: IL (V Dean)	Academic Year	: 2024-2025
Course No.	: DC-203	Course Title	: Chemistry of Milk
Credits	: 2+1=3	Total Marks	: 50
Day & Date	: Saturday; 09/08/2025	Time	: 2.00 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) Define the following. (05)

- i) Mutarotation
- ii) Saponification number
- iii) Denaturation
- iv) Lactoferrin
- v) Colostrum

B) Give one word for the following. (05)

- i) Deficiency disease caused due to vitamin B<sub>1</sub>.
- ii) Form of lactose present in milk powder.
- iii) Whey protein that binds retinol.
- iv) Enzyme responsible for formation of protease peptone.
- v) Major element present at highest concentration in milk.

Q. 2 A) State whether True or False. If false, rewrite the statement after making necessary corrections in the underlined words. (05)

- i) Calcium sensitive casein is κ-casein.
- ii) Human milk contains high lactose content.
- iii) Vitamin D is a strong antioxidant.
- iv) The nitrogen base present in lecithin is choline.
- v) Fat is present in the form of soluble state.

B) Choose the most appropriate answer from the options given below. (05)

- i) The protein involved in lactose synthesis .....
  - a) β-casein
  - b) α-lactalbumin
  - c) β-lactoglobulin
  - d) Immunoglobulin
- ii) The major constituents of milk lipid is .....
  - a) Triacylglycerol
  - b) Diacylglycerol
  - c) Phospholipids
  - d) Monoacylglycerol
- iii) The milk enzyme having bactericidal action is .....
  - a) Plasma
  - b) Lipoprotein lipase
  - c) Xanthine oxidase
  - d) Lysozyme
- iv) Most hydrophilic casein is .....
  - a) α<sub>s1</sub>-CN
  - b) α<sub>s2</sub>-CN
  - c) β-CN
  - d) κ-CN
- v) The most variable component in morning and evening milk is .....
  - a) Fat
  - b) Protein
  - c) Lactose
  - d) Minerals

SECTION –‘B’

- Q. 3 A) Define milk as per FSSAI regulations and give average composition of milk from different species. (05)  
B) Discuss the significance of lipase and alkaline phosphatase in dairy industry. (05)
- Q. 4 A) State the proof for structure of lactose. (05)  
B) Explain the solubility and crystallization properties of lactose. (05)
- Q. 5 A) Discuss in brief the genetic polymorphism of milk protein. (03)  
B) Write a short note on NPN constituents in milk. (03)  
C) Describe the structure of casein micelles. (04)
- Q. 6 A) Explain the physical equilibrium among the milk salts. (03)  
B) Write a note on vitamin D in milk. (03)  
C) Describe the types of Immunoglobulins in milk. (04)
- Q. 7 Classify milk lipids and give their distribution in milk. Discuss in brief the factors affecting fatty acid composition of milk. (10)

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