

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

Semester	: II (V Dean)	Academic Year	: 2021-2022
Course No.	: DC-203	Course Title	: <b>Chemistry of Milk</b>
Credits	: (2+1=3)	Total Marks	: 50
Day & Date	: Tuesday, 01/11/2022	Time	: 2.30 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) Most characteristic fatty acid present in milk fat.
    - a) Lauric acid
    - b) Oleic acid
    - c) Butyric acid
    - d) Palmitic acid
  - ii) Abnormal milk detected by Koestler Number.
    - a) Colostrum
    - b) Sour milk
    - c) Neutralized milk
    - d) Mastitis milk
  - iii) The form of lactose obtained above 93.5°C.
    - a)  $\alpha$ -Lactose monohydrate
    - b) Diamond shaped crystal
    - c)  $\beta$ -Lactose anhydrous
    - d) Tomahawk
  - iv) ..... is responsible for the stability of casein micelles.
    - a)  $\alpha_{S1}$ -Casein
    - b)  $\alpha_{S2}$ -Casein
    - c)  $\beta$ -casein
    - d)  $\kappa$ -Casein
  - v) Which of the following vitamin is absent in plant source?
    - a) Pantothenic acid
    - b) Riboflavin
    - c) Pyridoxine
    - d) Cyano cobalamin
- B) Define the following. (05)
- i) Casein
  - ii) Lactose glass
  - iii) Non protein nitrogen
  - iv) Unsaponifiable matter
  - v) Lysozyme
- Q. 2 A) Give reason of the following. (05)
- i) Lactose is a reducing sugar.
  - ii) Ash is not a true representative of milk salt system.
  - iii) Caseins are phosphoproteins.
  - iv) Phospholipids are complex lipids.
  - v) Fat is the most variable component in milk.

(P.T.O.)

- B) State whether True or False, If False, rewrite the statement after making (05)  
necessary corrections to the underlined word.
- i) Milk fat is present in the form of true solution.
  - ii)  $\beta$ -casein is protruding outside the casein micelle
  - iii) Sterols and carotenes are saponifiable matter.
  - iv) Lactulose is made up of glucose and galactose.
  - v) Lactoperoxidase is also called muramidase.

#### SECTION – 'B'

- Q. 3 A) Define milk in legal terms. Describe the various animal factors affecting (05)  
composition of milk.
- B) Discuss the importance of enzymes in milk and milk products. Briefly discuss the (05)  
significance of proteases and lipases.
- Q. 4 A) What are milk lipids? Discuss the fatty acid profile of bovine milk fat. (05)
- B) Write the composition of main classes of lipids in milk. Discuss the importance (05)  
of lipids in dairy industry.
- Q. 5 A) Describe the distribution of milk salts in different phases. (03)
- B) Write the structure and distribution of milk constituents. (03)
- C) Explain in details milk contact surfaces and metallic contamination. (04)
- Q. 6 A) Write the structures of  $\alpha$  and  $\beta$  lactose. Describe the differences between  $\alpha$  and  $\beta$  (03)  
lactose.
- B) Discuss the importance of lactose in milk and milk products. (03)
- C) Briefly describe chemistry of Maillard reaction. (04)
- Q. 7 Discuss the classification and nomenclature of milk proteins. Discuss the important (10)  
properties and biological role of  $\beta$ -lactoglobulin and  $\alpha$ -lactalbumin.

\*\*\*\*\*