

**MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR**  
**SEMESTER END THEORY EXAMINATION, B.Tech. Dairy Technology 2018-19**

Semester : **II (V Dean)**

Academic Year : **2018-2019**

Course No. : **DC-203**

Course Title : **Chemistry of milk**

Credits : **2+1=3**

Total Marks : **50**

Day & Date : **Thursday, 20.06.2019,**

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 milk constituent which shows variation during the milking is .....

- |             |            |
|-------------|------------|
| a) Fat      | b) Lactose |
| c) Minerals | d) SNF     |

ii) The enzymes which liberate fatty acids from lipoproteins and chylomicrons of the blood is .....

- |                         |                    |
|-------------------------|--------------------|
| a) Alkaline phosphatase | b) Lactoperoxidase |
| c) Catalase             | d) Lipase          |

iii) Lactose present in spray dried milk is ..... form.

- |                |                   |
|----------------|-------------------|
| a) Crystalline | b) Supersaturated |
| c) Polymorphic | d) Glass          |

iv) Whey protein, which is absent in human milk is .....

- |                           |                         |
|---------------------------|-------------------------|
| a) $\alpha$ -lactalbumin  | b) Bovine serum albumin |
| c) $\beta$ -lactoglobulin | d) Immunoglobulin       |

v) The major sterol present in milk fat is .....

- |                 |                |
|-----------------|----------------|
| a) Stigmasterol | b) Cholesterol |
| c) Ergosterol   | d) Phytosterol |

B) Define the following. (05)

- i) Casein
- ii) Mutarotation of lactose
- iii) Non protein nitrogen
- iv) Unsaponifiable matter
- v) Koestler number

Q. 2.    A)    Give reasons for 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) Milk is a complex fluid.

B) State whether True or False. If false, rewrite the statement after making necessary corrections. (05)

- i) Milk fat is present in the form of true solution.
- ii) Crystallization above 93.5°C results in the formation of  $\alpha$ -lactose.
- iii) Greatest changes in milk composition occur at the beginning and at the end of lactation.
- iv) Caseins are least susceptible to proteolytic enzymes.
- v) Lactoperoxidase is also called muramidase.

(P.T.O.)



## SECTION - 'B'

- Q. 3 A) Describe the importance and various properties of major constituents of milk. (05)  
 B) Write the structures of  $\alpha$  and  $\beta$  lactose. What are the differences between  $\alpha$  and  $\beta$  lactose? (05)
- Q. 4 A) Discuss the classification and nomenclature of milk proteins. (05)  
 B) Briefly discuss the important properties and significance of xanthine oxidase and lactoperoxidase. (05)
- Q. 5 A) Describe the distribution of milk salts in different phases. (03)  
 B) Discuss the effect of various treatments on salt equilibrium. (03)  
 C) Describe the pathways involved in formation melanoidins during heating of milk at higher temperature. (04)
- Q. 6 A) Write a short note on solubility of lactose. (03)  
 B) Discuss the important properties and biological role of  $\alpha$ -lactalbumin. (03)  
 C) Discuss the effect of plane of nutrition and lactation period on composition of milk. (04)
- Q. 7 What are milk lipids? Give the classification of lipids based on composition with examples. Write the composition of main classes of lipids in milk. Discuss the importance of lipids in dairy industry. (10)

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