

**MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR**  
**SEMESTER END THEORY EXAMINATION, B.Tech. (D.T.) Degree Course 2017-18.**

Semester	: II (New Syllabus)	Academic Year	: 2017-2018
Course No.	: DC-203	Course Title	: Chemistry of milk
Credits	: 2+1=3	Total Marks	: 50
Day & Date	: Wednesday, 20.06.2018	Time	: 11.00 to 13.00 Hrs.

- Note :**
- 1) All questions from **Section 'A'** are compulsory.
  - 2) Solve **Any Five** 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) Milk according to chemist is .....
  - a) Biological fluid
  - b) Complete food
  - c) Complex mixture
  - d) Nature's gift
- ii) In lactose solution, the  $\beta/\alpha$  ratio at equilibrium is about ..... at 20°C.
  - a) 0.60
  - b) 1.60
  - c) 0.68
  - d) 1.68
- iii) ..... is responsible for the stability of casein micelles.
  - a)  $\alpha_{S1}$ -Casein
  - b)  $\alpha_{S2}$ -Casein
  - c)  $\beta$ -Casein
  - d)  $\kappa$ -Casein
- iv) Deficiency of ..... can result into hemorrhagic problems.
  - a) Vitamin A
  - b) Vitamin D
  - c) Vitamin E
  - d) Vitamin K
- v) Milk fat is predominately present in spherical droplets which range from .....
  - a) 0.2 to 20  $\mu\text{m}$
  - b) 110 to 150  $\mu\text{m}$
  - c) 50 to 100  $\mu\text{m}$
  - d) More than 200  $\mu\text{m}$

B) Give two examples for the following. (05)

- i) Calcium-sensitive casein.
- ii) Enzyme as antimicrobial activity.
- iii) Isomers of lactose.
- iv) Major minerals in milk.
- v) Fat soluble vitamins.

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

- i) Lactose is a disaccharide.
- ii) Milk is an oil-in-water type emulsion.
- iii) Caseins are phosphoproteins.
- iv) Ash is not a true representative of milk salt.
- v) Phospholipids are complex lipids.

(P.T.O.)

- B) State whether True or False. If false, rewrite the statement after making necessary corrections. (05)
- i) Lactulose is made up of glucose and galactose.
  - ii) Mastitis milk contains increased level of lactose.
  - iii) Lysozyme requires thiocyanate and  $H_2O_2$  for its bactericidal activity.
  - iv)  $\beta$ -casein is most hydrophilic in nature.
  - v) Sterols and carotenes are saponifiable matter.

### SECTION - 'B'

- Q. 3 Define milk in legal terms. Briefly describe the various animal factors affecting composition of milk. (06)
- Q. 4 Discuss the properties and significance of alkaline phosphatase and lactoperoxidase in dairy industry. (06)
- Q. 5 Define the term protein. Classify and discuss the milk proteins indicating their approximate concentration in milk. (06)
- Q. 6
- a) Write the structure of  $\alpha$ -lactose and indicate how it differs from that of  $\beta$ -form. (02)
  - b) Discuss the importance of lipids in milk. (02)
  - c) Write a short note on structure and distribution of milk constituents. (02)
- Q. 7
- a) Discuss the fatty acid profile of bovine milk lipids. (03)
  - b) Explain the mechanism of Maillard browning reaction in milk. (03)
- Q. 8 Write short note on the following.
- a) Koestler number (02)
  - b) Mutarotation of lactose (02)
  - c) Phospholipids (02)
- Q. 9
- a) Discuss about salt balance in milk. (02)
  - b) Describe the equilibrium among the milk salt systems. (04)

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