

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-202	Course Title	: Physical Chemistry of Milk
Credits	: 2+1=3	Total Marks	: 50
Day & Date	: Wednesday, 02/11/2022	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) The boiling point of milk is
 - a) 100°C
 - b) 100.15°C
 - c) 95°C
 - d) 99.9°C
- ii) Viscosity of milk fall within the range of centipoise.
 - a) 1.5-2.0
 - b) 2.0-3.0
 - c) 3.5-4.0
 - d) None of these
- iii) A mixture of two immiscible liquids is known as
 - a) Colloids
 - b) Solutions
 - c) Gels
 - d) Emulsion
- iv) are major components affecting the freezing point of milk.
 - a) Lactose and soluble salts
 - b) Protein and Vitamin
 - c) Fat and Protein
 - d) Vitamin and Fat
- v) is unit of surface tension.
 - a) Dyne
 - b) Kg/m^3
 - c) Centipoise
 - d) g/ml

B) Define the following. (05)

- i) Colligative property
- ii) Milk according to chemist
- iii) Isotopes
- iv) Buffering index
- v) Ash

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

- i) Specific gravity of freshly drawn milk is lower than the stored milk.
- ii) Milk is having lower surface tension than water.
- iii) Homogenization process increases the viscosity of milk.
- iv) Milk is opaque.
- v) Boiling point is a colligative property.

(P.T.O.)

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

- i) The specific gravity of milk can be decreased by removal of fat.
- ii) Hydrometer is used for determination of surface tension of milk.
- iii) Methyl orange is used as an indicator for determination of acidity of milk.
- iv) Specific gravity is a unit less quantity.
- v) Gels are mostly solid, yet they behave like liquid due to a three dimensional cross linked network within the liquid.

SECTION - 'B'

- Q. 3 A) State the Raoult's law. Explain the factors affecting freezing point of milk. (05)
B) Derive the Henderson-Hasselbach equation. Explain in details milk as a buffer system. (05)
- Q. 4 A) Explain the different method used for determination of density and specific gravity of milk. (05)
B) Define the term interfacial tension. State the surface tension of dairy products. Enlighten the factors affecting the surface tension. (05)
- Q. 5 A) Narrate the Arrhenius and Lewis concept of acid and base. (03)
B) Mention the significance of redox potential in the dairy industry. (03)
C) Explain in details gross composition of milk. (04)
- Q. 6 A) Write a note on pH electrode. (03)
B) Differentiate between lyophilic and lyophobic colloids. (03)
C) Write a note on electrical conductivity of milk. (04)
- Q. 7 Define viscosity. Give the viscosity value for dairy products. Explain in detail different factors affecting the viscosity of milk. (10)
