

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

Semester	: II (V Dean)	Academic Year	: 2024-2025
Course No.	: DC-202	Course Title	: Physical Chemistry of Milk
Credits	: 2+1=3	Total Marks	: 50
Day & Date	: Thursday; 07/08/2025	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) Freezing point
- ii) Thixotrophy
- iii) Boiling point
- iv) Lambert Beer law
- v) Electrolytes

B) Answer the following. (05)

- i) Why does colostrum have high natural acidity?
- ii) State the limitation of Ostwalds dilution law.
- iii) Enlist the various types of lactometers.
- iv) State the units of surface tension and viscosity.
- v) Expand the terms IR and UV.

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

- i) Dilution of milk will have no affect on acidity and pH.
- ii) For titration of weak acid and strong base indicator used is phenolphthalein.
- iii) Physical half life is the period needed to reduce the concentration of radioactive emission by an isotope to half of its original level.
- iv) Specific gravity is expressed as kg/m<sup>3</sup>.
- v) Visible wavelength ranges from 0-400 nm.

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

- i) The acidity observed in a freshly drawn milk is known as .....
  - a) Apparent acidity
  - b) True acidity
  - c) Developed acidity
  - d) Titratable acidity
- ii) When a ~~dehydrated~~ gel fails to regain its elasticity, it is called as .....
  - a) Elastic gel
  - b) Reversible gel
  - c) Broken gel
  - d) Non elastic gel
- iii) The process of splitting of the molecules into ions of an electrolyte is called .....
  - a) Ionization
  - b) Electrolysis
  - c) Removal of fat
  - d) All of these

(P.T.O.)

- iv) The principle involved in the functioning of lactometer is .....
- a) Ostwalds theory of dilution      b) Law of mass action
- c) Archimedes principle      d) Le Chattleir's principle
- v) Boiling point of milk is .....
- a) 100 °C      b) 100.15°C
- c) 120°C      d) 150°C

**SECTION - 'B'**

- Q. 3 A) Discuss the Handerson –Hasselbalch equation and mention its significance. (05)  
B) Explain the concept of Lewis acids and bases and explain how it differs from the concept of Bronsted and Lowry. (05)
- Q. 4 A) Define surface tension. Explain the factors influencing surface tension of milk. (05)  
B) Classify gels and write the properties of gels. (05)
- Q. 5 A) Describe various factor affecting acidity of milk. (03)  
B) Differentiate between Newtonian and non-Newtonian liquids. (03)  
C) Explain Raoults law and lowering of vapour pressure. (04)
- Q. 6 A) Discuss in brief electromagnetic spectrum of light. (03)  
B) Write a short note on redox potential of milk. (03)  
C) Differentiate between lyophillic and lyophobic sols. (04)
- Q. 7 Define density and specific gravity? Elucidate different methods to determine density or specific gravity of milk. Discuss in brief the various factors affecting specific gravity of milk. (10)

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