

**MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR**  
**SEMESTER END THEORY EXAMINATION, B. TECH. (D.T.) DEGREE COURSE 2018-19**

Semester	: I (New Syllabus)	Academic Year	: 2018-2019
Course No.	: DC-101	Course Title	: Physical Chemistry of Milk
Credits	: 2+1-3	Total Marks	: 50
Day & Date	: Monday, 14/01/2019	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) The most sensitive method for detecting added water in milk is the determination of .....
  - a) Specific gravity
  - b) Refractive Index
  - c) Freezing point
  - d) None of these
- ii) The equation for knowing the pH of a buffer solution is proposed by .....
  - a) Henderson
  - b) Nernst
  - c) Oswald
  - d) Henderson Hasselbalch
- iii) The milk constituent that exists in colloidal form is .....
  - a) Fat
  - b) Lactose
  - c) Casein
  - d) Sodium
- iv) The density of water is maximum at .....
  - a) 4°C
  - b) 15.5°C
  - c) 20°C
  - d) None of these
- v) Among the milk and milk products the Newtonian behavior is exhibited by .....
  - a) Concentrated milk
  - b) Ice-cream mix
  - c) Cream
  - d) Ghee

B) Do as directed. (05)

- i) Enlist the constituents which contribute to the natural acidity of milk.
- ii) What is the unit of surface energy?
- iii) Define half life period of radio isotopes.
- iv) What is the operating temperature of Quevenne lactometer?
- v) State the Raoult's Law.

Q. 2 A) Answer in one line (05)

- i) Give the examples of radioactive elements.
- ii) What do you understand by the term Recknagel phenomenon?
- iii) What is the specific gravity of milk fat?
- iv) What is the normal pH of milk?
- v) Give the two examples of oil-in-water emulsion.

(P.T.O.)

- B) State whether True or False. If false, rewrite the statement after making necessary corrections. (05)
- i) Hortvet cryoscope is used for determination of freezing point of milk.
  - ii) Light yellow colour of milk is due to thiamine.
  - iii)  $\text{CH}_3\text{COOH}$  and  $\text{CH}_3\text{COONa}$  is basic buffer
  - iv) Colligative properties are properties of solutions that depend on the number of molecules in a given amount of solvent
  - v) Stalagmometer is used for determination of viscosity of milk.

### SECTION - 'B'

- Q. 3 Differentiate between density and specific gravity. Discuss the various methods for determination of density and specific gravity of milk. (06)
- Q. 4 Define surface tension. Write in detail various factors influencing surface tension of milk. (06)
- Q. 5 Define and explain refractive index. Give its applications in the field of dairying. (06)
- Q. 6
- a) Define buffer and state its importance. (02)
  - b) What are the different properties of gels? (02)
  - c) Give Nernst equation. (02)
- Q. 7
- a) Enlighten the factors affecting viscosity of milk. (03)
  - b) Explain boiling point elevation as colligative property. (03)
- Q. 8
- a) Enlist the methods of determination of viscosity in milk. (02)
  - b) State the Ostwald's dilution law. (02)
  - c) Write a note on redox system of milk. (02)
- Q. 9
- a) Write a note on hydrogen electrode. (02)
  - b) Explain the Stoke's law. (04)

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