

PARUL UNIVERSITY
FACULTY OF AGRICULTURE
B.Tech. (Dairy Technology) Winter 2019 - 20 Examination

Semester: 2

Subject Code: 20104156

Subject Name: Physical Chemistry of Milk

Date: 17/12/2019

Time: 10:30 am to 12:30 pm

Total Marks: 50

Instructions

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1**A) Fill in the blanks (Each of 0.5 Mark)****(05)**

- i) The milk constituent that exists in colloidal form is-----
- ii) The principle sugar present in the milk is-----
- iii) The Hortvet Cryoscope is used for the determination of -----
- iv) Colloidal calcium caseinate phosphahate are responsible for ----- color of milk
- v) The operating temperature of Quevenne lactometer is -----
- vi) Milk is ----- type of emulsion.
- vii) The unit of specific gravity of milk is -----
- viii) The natural pH of milk is -----
- ix) Light yellow color of cow milk is due to -----
- x) The developed acidity of milk is due to-----

B) Multiple Choice Questions (Each of 0.5 Mark)**(10)**

- i) A mixture of two immiscible liquids is known as.....
a) Colloids b) Gels c) Solutions d) Emulsions
- ii) The boiling point of milk is -----⁰C.
a) 100 b) 100.15 c) 95 d) 70
- iii) The buffer having weak acid and its salt with strong alkali is-----
a) Acidic Buffer b) Basic Buffer c) Neutral buffer d) None of these
- iv) In milk the constituents which depresses the surface tension are----
a) Salts b) Lipids c) Minerals d) Carbohydrates
- v) The effect of homogenization of whole milk on the density is-----
a) Slight increase b) Slight decrease c) High increase d) No effect
- vi) The equation for knowing the pH of a buffer solution is proposed by-----
a) Henderson b) Nernst c) Ostwald d) Henderson -Hasselbalch
- vii) Among the milk and milk products the Newtonian behavior is exhibited by-----
a) Concentrated milk b) Ice-cream mix c) Cream d) Ghee
- viii) In MBRT test reduction of methylene blue color is due to -----.
a) Eh Potential b) Vapor Pressure c) Refractive index d) Buffering capacity
- ix) The fat % in skimmed milk is not less than-----
a) 0.5 b) 1..5 c) 2.5 d) 3.0
- x) The stalagmometer is used for the determination of -----
a) Specific gravity b) Surface Tension c) Viscosity d) Acidity
- xi) Electrical conductivity of milk is contributed by-----
a) Chloride b) Lactose c) Fat d) Protein
- xii) Recknagel phenomenon in milk is caused by -----.
a) Chilling b) Heating c) Boiling d) Condensing

- xiii) -----contributes to viscosity of milk.
 a) Lactose b) Fat c) Minerals d) Vitamins
- xiv) The milk constituent that exists in true solution form is-----
 a) Fat b) Casein c) Lactose d) Calcium
- xv) 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
- xvi) The refractive index of cow milk is in the range of -----
 a) 1.3440 to 1.3485 b) 1.3240 to 1.3340 c) 1.3150 to 1.3250
 d) 1.3550 to 1.3660
- xvii) An example for the water- in- oil type of emulsion is-----
 a) Milk b) Cream c) Ghee d) Butter
- xviii) The greenish color of whey is due to -----.
 a) Riboflavin b) Casein c) Fat d) Carotene
- xix) Which of the following is not a colligative property?
 a) Freezing point of depression b) Vapor pressure
 c) Refractive index d) Boiling point of elevation
- xx) The average freezing point of bovine milk is usually within the range
 a) -0.512 to - 0.550 °C b) -0.450 to - 0.470 °C
 c) -0.350 to - 0.380 °C d) -0.560 to - 0.650 °C

Q.2

A) Define the following (Any five out of seven questions) (05)

- (1) Electrolyte
- (2) Buffer
- (3) Natural acidity
- (4) Electrical conductivity
- (5) Poise
- (6) Isotope
- (7) Surface energy

B) Answer the following (Any five out of seven questions) (05)

- (1) What are the sources of entry of radionuclides in milk?
- (2) Enlist the constituents which contribute to the buffering capacity of milk.
- (3) What do you understand by the term 'Recknagal' phenomenon.
- (4) Differentiate between lyophilic and lyophobic colloids.
- (5) What is Gel?
- (6) Give two examples for Newtonian fluids.
- (7) Enlist types of lactometers with their temperature.

Q.3 Write Short notes (Any five out of six questions) (10)

- (1) Half life period
- (2) Interfacial tension
- (3) Foam
- (4) Ostwald Dilution law
- (5) Redox system of milk
- (6) Stokes Law

Q.4 Long Questions (Any three out of four questions) (15)

- (1) Define the term Viscosity. Discuss in detail various factors affecting viscosity of milk.
- (2) Define colligative property. Explain the factors affecting for freezing point of depression.
- (3) Define refractive index and give its applications in the field of dairying
- (4) Differentiate between density and specific gravity. Discuss the various methods for determination of density and specific gravity of milk.