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2018

FOOD PRODUCT TECHNOLOGY-III

Paper : FPT 502

(Milk & Milk Products)

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer **any five** questions.

1. (a) Match the following : 4

	Milk Type		MF (%)
(i)	Standardized milk	-	1.5
(ii)	Double toned milk	-	0.5
(iii)	Skim milk	-	3.0
(iv)	Recombined milk	-	4.5

- (b) Give the chart showing the classification of milk constituents. 4

- (c) Write about the physico-chemical properties of major milk constituents.

12

Contd.

2. (a) Mention the changes in milk due to the growth of microorganisms and write about the methods for the destruction of microorganisms. 4+4=8

(b) Explain the cooling methods for the safe storage of milk. 12

3. (a) Given 2000 kg of cream testing 60% fat. How much skim milk testing 0.5% fat must be added to obtain 30% fat in the standardized cream? Use Pearson's Square for the calculation. 4

(b) Explain the working principle of centrifugal milk separator with proper diagram. 6+4=10

(c) Write short notes on UHT sterilization of milk. 6

4. (a) Calculate the rate of movement of a fat globule in a centrifugal separator, if : the diameter of fat particle $6\mu\text{m}$, radius of bowl 12cm , rpm of bowl 6000, capacity of the separator 4000 l/h. Volume of milk in the bowl of 4 litres.

$$\rho_s = 1.040 \text{ g/cm}^3, \rho_f = 0.96 \text{ g/cm}^3$$

$$\mu = 2.16 \text{ centipoise at } 21^\circ\text{C}. \quad 5$$

- (b) Explain about the mechanical washing of milk containers. 10
- (c) Write the steps in CIP method for HTST pasteurizer. 5
5. (a) Explain the manufacturing process of Recombined milk. 6
- (b) Give the details about gravitational method for the production of cream. 8
- (c) Provide the flow chart for the manufacturing of butter. 6
6. (a) Explain the drum process method for the production of whole milk powder and skim milk powder. 10
- (b) Write short notes on the manufacturing process of evaporated milk with suitable flow diagram. 10
7. (a) Write about *any two* sweeteners and stabilizers used in the making process of ice cream. 4+4=8

(b) Explain *any three* flavor and texture defects and their prevention measures in the production of ice cream. 6

(c) Provide the flow chart for the production process of cheddar cheese. 6

