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53 (FPT 502) FPTC-III

2014

## FOOD PRODUCT TECHNOLOGY III

(Milk and Milk Products)

Full Marks : 100

Pass Marks : 30

Time : Three hours

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

*Answer any five questions.*

1. (a) What is Milk ? Explain the chemical structure of milk with diagram. 1+5
- (b) (i) What is the range of iodine value of milk ?
- (ii) What is the *pH* of cow's milk ?
- (iii) What is casein miscells ?
- (iv) What is the composition of milk serum ?
- (v) What is overrun ? 1×5

Contd.

- (c) Explain *any three* properties of milk. 4
- (d) Explain how denaturation of serum protein occurs due to heating of milk. 5
2. (a) When oxidation of milk fat takes place ?  
What happens during the oxidation process ? 6
- (b) What is homogenization ? What are its objectives ? 1+3
- (c) Why clarification of milk is done ? How it is different from centrifugation ? Explain the working procedure of clarifiers with a neat diagram. 1+1+8
3. (a) What are the objectives of heat treatment ? 4
- (b) What are the changes that occur in milk including the chemical and physical changes due to heat treatment ? 6
- (c) Explain the working procedure of homogenizer. 6
- (d) What is heat regeneration ? Explain. 4

4. (a) What changes occur during storage of milk ?  
Explain. 6

(b) (i) Name any heat resistant psychrotrophs.

(ii) Why milk heated at  $75^{\circ}\text{C}$  for 20-60 seconds will start to smell and taste "cooked" ?

(iii) Which compound is responsible for sunlight flavour ?

(iv) Define eutectic point. 4

(c) Explain in details, the processing of icecream. 10

5. (a) What is standardization of milk ? How many kg each of 28% cream and 3% milk will be required to make 500kg of a mixture testing 4% fat ? 1+5

(b) What is platform test ? Explain *any two* types of platform test. 1+3

(c) Explain the detail processing of milk powder. 10

6. (a) Define dairy starter culture. Is there any role of starter culture in the quality of the product? Justify. In what way starter culture can be classified? 1+5+4

(b) Explain the citric metabolism by LAB for producing flavour compounds in the product. 10

7. (a) Explain the working of plate heat exchangers with its advantages and disadvantages. 12

(b) In 10,000kg milk testing 3.6% fat and 11.50% TS and cream, testing 30% fat. If condensed milk product, 9.05% fat and 28% total milk-solids are wanted, then find how much 30% cream must be added to provide the desired ratio of fat to SNF? 6

(c) What is the name of the pathway by which galactose can be converted to glucose? 1

(d) What is the freezing point of cow's milk? 1