53 (FPT 502) FPTC III

2013

(December)

FOOD PRODUCT TECHNOLOGY III
(MILK & MILK PRODUCTS)

Paper : FPT 502

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)* *(i)* What is thermalization ? 1×5=5

(ii) Name any heat resistant psychrotrophs.

(iii) Define the eutectic point.

(iv) What is overrun ?

(v) Which compound is responsible for sunlight flavour ?

(b) What changes occur during the storage of milk ? 5

(c) Explain *any three* properties of milk. 4

(d) When oxidation of milk fat takes place ? What happens during the oxidation process ? 1+5=6

2. (a) What is milk ? Write the general aspects of milk processing. 1+3=4

(b) Explain the effect of heat in the constituents of milk. 5

(c) Explain the structural elements of milk with diagram. 5

(d) Why clarification of milk is done ? How it is different from centrifugation ? Explain the working procedure of clarifiers with neat diagram. 1+1+4

3. (a) Discuss the operation of homogenizer. 10

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

(c) What is the importance of a stabilizer in the making of ice cream ? 2

(d) What is the pressure maintained in HTST system for pasteurized milk ? 1

(e) Before homogenization, milk should be above its melting point. Why ? 1

4. (a) (i) What is the advantages of double stage homogenizer over single stage homogenizer ?

(ii) Why the homogenizing sequence of Indian condition is more desirable ?

(iii) What is the sequence of various processes for homogenized milk under Indian condition ?

(iv) What is the temperature required to inactivate the lipase enzyme present in milk ? 1×4

(b) What is heat regeneration ? What are its disadvantages ? Calculate the outlet temperature of the pasteurized milk used to preheat a milk with initial temperature of 10°C to a temperature of 68°C. Given, the regeneration efficiency is 95%, pasteurization temperature is 72°C. 1+1+2

(c) Explain the working of plate heat exchangers with its advantages and disadvantage. 8

(d) Find the amount of water to be mixed with buffalo milk (1000*kg*, 7.5% flat, 9.8% SNF) and skim milk powder (0.5% fat, 96.5% SNF) to obtain tonned milk of 3% fat and 8.5% SNF. 4

5. (a) What is dairy starter culture ? Discuss the different types of starter culture. Explain the role played by starter culture during milk fermentation. 1+4+3

(b) Lactose can be converted to glucose and galactose by the enzyme _____. 1

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

(d) Explain the glycolytic pathway of homofermentative lactic bacteria. 10

6. (a) List out *any three* types of fermented milk products with their respective microorganisms and description of the products. 6

(b) (i) What is the range of iodine value of milk ? 1×4=4

(ii) What is the acidic *pH* of cow's milk ?

(iii) What is casein miscells ?

(iv) What is the composition of milk serum ?

(c) Explain the detail processing of cheese making. 10

7. (a) Explain the detail processing of amul powder. 10

(b) What is condensed milk ? What are the test performed in receiving of milk for condensed milk products ? 1+4=5

(c) In 10,000 *kg* milk testing 3.60% fat and 12.50% TS, and cream (from the same milk), testing 40% fat. If condensed milk product, 9.05% fat and 31% total milk-solids are wanted, then find how much 40% cream must be added to provide the desired ratio of fat to SNF ? 5