



Name :
Roll No. :
Invigilator's Signature :

CS/B.TECH(FT)/SEM-5/FT-502/2011-12

2011

**FOOD PROCESS TECHNOLOGY-III
(MILK AND DAIRY PRODUCTS)**

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :
10 × 1 = 10
- i) As per PFA minimum fat% in milk cream is
 - a) 30
 - b) 25
 - c) 35
 - d) 20.
 - ii) The index organism for Pasteurization is
 - a) *Staphylococcus aureus*
 - b) *Streptococcus thermophilus*
 - c) *Coxelliae burnittii*
 - d) *Bacillus subtilis*.
 - iii) The higher the fat percentage in cream
 - a) the greater the viscosity
 - b) the lesser the viscosity
 - c) viscosity remains unaltered
 - d) all of these.



- iv) Adulteration of water in milk can be determined quickly by
 - a) Lactometer
 - b) Kjeldhal Method
 - c) Centrifugal separation method
 - d) none of these.
- v) Low fat content than the specified level in milk can indicate addition of
 - a) water
 - b) skim milk
 - c) both (a) and (b)
 - d) addition of cream.
- vi) In milk, each fat globules is surrounded by thin layer of
 - a) protein
 - b) phospholipids
 - c) both (a) and (b)
 - d) lactose.
- vii) Milk is an
 - a) oil in water type emulsion
 - b) water in oil type emulsion
 - c) oil in protein emulsion
 - d) oil in carbohydrate emulsion.
- viii) Milk spoilage results in
 - a) increase in pH
 - b) decrease in pH
 - c) pH remain constant
 - d) all of these.
- ix) Role of calcium salts during renin coagulation of milk is to
 - a) diminish the electrostatic repulsion
 - b) make salt linkages between positive sites and para casein micelles
 - c) both (a) and (b)
 - d) none of these.
- x) The isoelectric point of casein is at pH
 - a) 5.4
 - b) 4.6
 - c) 6.4
 - d) none of these.
- xi) The number of leucocytes increases in
 - a) pasteurized milk
 - b) sterilized milk
 - c) mastitic milk
 - d) none of these.



- xii) Gerber method is used for estimation of
 a) fat content of milk b) protein content of milk
 c) acidity of milk d) microbial load in milk.
- xiii) Tetraphosphate is used in dairy industry as
 a) surface active agent b) sanitizing agent
 c) sequestering agent d) none of these.
- xiv) Example of an acid-alcohol fermented milk product is
 a) Kefir b) Yoghurt
 c) Cultured buttermilk d) Acidophilus milk.
- xv) Example of calcium-insensitive casein is
 a) K-casein b) α_s -Casein
 c) both (a) and (b) d) none of these.

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following $3 \times 5 = 15$

2. What is Turbidity test ? What is the principle involved in this test ? How this test is performed ? $1 + 2 + 2$
3. How many Kg of 30% cream and 4% milk will be required to make 250 kg of a mixture testing 6% fat ? Explain King's Modern Theory of Butter Churning. $2 + 3$
4. What is milk stone ? How it can effectively be removed from dairy equipments ? $2 + 3$
5. What is the purpose of preparing flavoured milk ? Differentiate between Flavoured milk and Flavoured drink. Write down the flow diagram of preparation of Chocolate Flavoured milk. $1 + 1 + 3$
6. What is Recknagel phenomenon ? Write down the Richmond's formula used for calculating total solids and solid not fat content of milk by using lactometer. Name the different types of lactometer used in dairy industry. $2 + 2 + 1$
7. What is mastitis ? Write down the name of the causative organisms causing mastitis. Explain two confirmatory test for detection of mastitic milk. $1 + 1 + 3$



GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

8. a) An ice-cream mixer formulation having a viscosity of 70 cp and density 1015 kg/m^3 is being canned aseptically at a rate of 5 gallon per min. If the mixer is heated to 140°C passed through a 100 ft long 1 inch nominal stainless steel pipe and cooled. Calculate the sterilizing value of this process based on $PA = 3679$, $D_0 = 1.83 \text{ min}$, $z = 24^\circ\text{C}$.
- b) Discuss the role of lactoperoxidase in milk preservation.
- c) Name the tests to be carried out for receiving milk in serial order. $6 + 4 + 5$
9. a) Differentiate between Kefir and Kumiss. Give the process flow diagram of Cheddar cheese. Explain the milk-clotting mechanism by rennet action during cheese processing.
- b) What are the possible reasons for change in fat and SNF composition of milk ?
- c) Why is homogenized fat not suitable for whipping ? $4 + 4 + 4 + 3$
10. Briefly describe different steps involved in manufacture of Ice-Cream. Given 1000 kg cream testing 50% fat. How much skim milk testing 0.2% fat must be added to obtain 45% fat in the standardized cream ? $10 + 5$
11. With the help of a flow diagram, show how SMP is manufactured by spray drying. How is lumpiness prevented in milk powder ? What do you mean by malted milk powder ? $9 + 3 + 3$
12. Define churning in the butter making process. What is skimming efficiency of cream separator ?
Given 100 kg of milk testing 7.5% fat. Cream produced 14.1 kg testing 52.5% fat. Determine the SE. What is the role of salting in butter making ? Fat in Churn = 800 kg. Butter is to contain 2.0% salt. How much salt to be added to the Churn ? $3 + 3 + 4 + 2 + 3$

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