SRM VALLIAMMAI ENGINEERING COLLEGE
(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF AGRICULTURAL ENGINEERING

QUESTION BANK

VI SEMESTER

1902602 FOOD AND DAIRY ENGINEERING
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Prepared by

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SUBJECT:FOOD AND DAIRY ENGINEERING
SEM / YEAR: 06 /III

UNIT-I: PROPERTIES AND PROCESSING OF MILK **9**

Dairy Industry - importance and status - Milk Types - Composition and properties of milk -Production of high quality milk - Method of raw milk procurement and preservation -Processing - Staining - Filtering and Clarification - cream separation – Pasteurization -Homogenization - sterilization, UHT processing and aseptic packaging -emulsification -Fortification.

PART - A

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Write the effect of pH on the milk quality.	BT-4	Analysing
2.	Write about the status of dairy development in India.	BT-2	Understanding
3.	Describe the procedure of quality evaluation of milk before Processing.	BT-1	Remembering
4.	Give in brief, the purpose/desirable objective of milk Pasteurization.	BT-2	Understanding
5.	What are the key factors driving the dairy industry in India?	BT-1	Remembering
6.	What is the breakup of the dairy industry in India based on the product type?	BT-1	Remembering
7.	Differentiate between pasteurization and sterilization.	BT-2	Understanding
8.	What are the factors that affect the flavor and color of milk ?	BT-1	Remembering
9.	Write the importance of emulsifier in butter manufacturing.	BT-4	Analysing
10.	What do you understand about milk fortification process?	BT-1	Remembering
11.	What do you mean by operation flood?	BT-3	Applying
12.	Write the constituents of buffalo milk.	BT-1	Remembering
13.	Classify packaged milk according to its fat content.	BT-2	Understanding
14.	List out some emulsifiers.	BT-1	Remembering
15.	What are the important properties of milk, which affect the processing?	BT-4	Analysing
16.	How the density and viscosity of milk affect the milk processing operations?	BT-5	Evaluating
17.	Differentiate between boiling point and freezing point of milk.	BT-2	Understanding
18.	Differentiate clarifier and separator.	BT-4	Analysing
19.	How the density and viscosity of milk affect the milk processing operations?	BT-2	Understanding
20.	What is NDDB? When this act was established in India.	BT-1	Remembering
21.	Write a short note on UHT packaging.	BT-1	Remembering
22.	What are the types of milk?	BT-2	Understanding

23.	Explain the working principle of a lactometer.	BT-3	Applying
24.	Calculate regeneration efficiency when the milk enters at 4°C, after regeneration reaches 65°C and final temperature of 72°C.	BT-4	Analysing
25.	Write short not on FDV.	BT-2	Understanding

PART – B

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Write short notes on importance and status of dairy industry in India.	BT-2	Understanding
2.	Brief gravity method of cream separation.	BT-1	Remembering
3.	Explain HTST pasteurization process with a neat sketch.	BT-5	Evaluating
4.	Compare and contrast cream separation methods.	BT-3	Applying
5.	Explain different components of homogenizer and the working principle.	BT-5	Evaluating
6.	Differentiate different pasteurization techniques.	BT-3	Applying
7.	Demonstrate different types of milk.	BT-1	Remembering
8.	Explain the impact of operation flood in Indian dairy industry.	BT-5	Evaluating
9.	Compare various theories of homogenization with its process.	BT-4	Analysing
10.	Compare different types of LTLT pasteurization.	BT-4	Analysing
11.	Elaborate various properties and composition of milk.	BT-2	Understanding
12.	Discuss about various sterilization process with merits and demerits.	BT-3	Applying
13.	Explain about clarification process of milk.	BT-2	Understanding
14.	Demonstrate cream separator with its important components.	BT-1	Remembering
15.	Describe about clarifier with neat sketch.	BT-2	Understanding
16.	Differentiate filter and clarifier.	BT-4	Analysing
17.	What are the different types of filter and explain it.	BT-2	Understanding

PART-C

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Elaborate HTST pasteurization with its parts.	BT-1	Remembering
2.	Detail centrifugal method of cream separation.	BT-1	Remembering
3.	State the processes of in-bottle sterilization.	BT-2	Understanding
4.	Analyse the merits and demerits of UHT processing and aseptic packaging.	BT-4	Analysing
5.	Brief about emulsification and fortification of milk.	BT-3	Applying

UNIT-II: DAIRY PRODUCTS **9**

Manufacture of Milk Powder - Processing of Milk Products - Condensed Milk - Skim milk - Butter milk - Flavoured Milk, whey, casein, yoghurt and paneer - Manufacture of Butter - Cheese Ghee, ice creams and frozen desserts - standards for milk and milk products - Packaging of Milk and Milk Products - Cleaning and Sanitation - Dairy effluent treatment and disposal.

PART - A

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Draw a flow chart for manufacturing milk powder.	BT-1	Remembering
2.	Classify butter based on end use.	BT-4	Analysing
3.	Write down the composition of butter.	BT-1	Remembering
4.	List out various ghee making methods.	BT-1	Remembering
5.	Write short notes on AGMARK ghee specification.	BT-4	Analysing
6.	Criticize the factors affecting quality and yield of paneer.	BT-5	Evaluating
7.	Give the gross composition of paneer.	BT-2	Understanding
8.	Define Cheese.	BT-1	Remembering
9.	What is the role of stabilizers and emulsifiers in ice cream?	BT-4	Analysing
10.	Write the importance of salting.	BT-3	Applying
11.	What are the important contributors to the viscosity of skim milk?	BT-2	Understanding
12.	Write short notes on BIS standards for milk and milk products.	BT-1	Remembering
13.	List out the packaging materials used for milk and milk products.	BT-1	Remembering
14.	Classify cheese based on ripening.	BT-4	Analysing
15.	List out the different sanitizing materials.	BT-2	Remembering
16.	Write down the purpose of emulsifiers.	BT-2	Understanding
17.	Write short notes on aluminium foil.	BT-1	Remembering
18.	Which method of ghee-making yields highest amount of ghee-residue?	BT-4	Analysing
19.	List out the objectives of treating dairy effluent.	BT-2	Understanding
20.	What is the difference between ice cream and frozen desserts?	BT-4	Analysing
21	What is frozen yoghurt?	BT-1	Remembering
22	What is the effect of temperature of precipitation on the quality of casein?	BT-4	Analysing
23	Differentiate between condensed milk and evaporated milk.	BT-5	Evaluating
24	What are the differences between rennet casein and acid casein?	BT-4	Analysing
25	As per the FSSR (2011), what is the minimum percentage of milk protein in nonanimal rennet casein and acid caseins?	BT-4	Analysing

PART – B

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Discuss the procedure of ice cream manufacturing.	BT-1	Remembering
2.	What is centrifugation?Explain their principles.	BT-5	Evaluating
3.	Write and explain the technical flow diagram for the preparation of paneer.	BT-4	Analysing
4.	Write short notes on frozen desserts composition.	BT-4	Analysing
5.	Describe about sanitization procedure.	BT-4	Understanding
6.	Give the processing steps involved in the manufacture of	BT-3	Applying

	sweetened condensed milk.		
7.	With the help of a neat flow diagram, describe acid casein manufacturing process.	BT-3	Applying
8.	Analyse the BIS standards for milk and milk products.	BT-5	Evaluating
9.	Demonstrate the butter manufacturing process.	BT-2	Understanding
10.	Elaborate biological filtration.	BT-5	Evaluating
11.	Write the flow diagram for the manufacture of ghee by creamery butter method	BT-2	Understanding
12.	Write short notes on Composition, Objective and sources of dairy effluent.	BT-1	Remembering
13.	Differentiate yoghurt with other milk products.	BT-3	Applying
14.	Describe the general procedure of making cheese.	BT-1	Remembering
15.	Explain the processing of milk products.	BT-2	Understanding
16.	Detail whey manufacturing process.	BT-3	Applying
17.	Explain the characteristics of butter milk and its preparation	BT-3	Applying

PART-C

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Enumerate aerobic treatment of dairy effluent.	BT-4	Analysing
2.	Elaborate creamery butter method with flow chart.	BT-2	Understanding
3.	Explain the skim milk powder manufacturing process.	BT-2	Understanding
4.	Enumerate the different kinds of evaporators used for concentration of milk.	BT-1	Remembering
5.	Compare and differentiate different packaging materials used for packing milk and milk products.	BT-5	Evaluating

UNIT-III: FOOD AND ITS PROPERTIES, REACTION AND KINETICS 9

Constituents of food - thermal processing of foods - cooking, blanching, sterilization, pasteurization, canning - Interaction of heat energy on food components, reaction kinetics, Arrhenius equation, TDT curves - water activity, sorption behaviour of foods – isotherm models - monolayer value, BET isotherms, Raoult' s law, Norrish, Ross, Salwin – Slawson equations.

PART - A

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	What is reaction kinetics? Write their application in food engineering.	BT-2	Understanding
2.	What are the components of food?	BT-1	Remembering
3.	Which vitamin is required for maintaining good eyesight?	BT-2	Understanding
4.	What is the function of carbohydrates for our bodies?	BT-1	Remembering
5.	What is the function of water in our bodies?	BT-4	Analysing
6.	Why do we need to include iron in a balanced diet?	BT-4	Analysing
7.	Write short notes on roughage.	BT-2	Understanding
8.	List out the advantages of drying.	BT-2	Understanding

9.	State 12-D concept in thermal processing.	BT-4	Analysing
10.	Write BET isotherm equation.	BT-1	Remembering
11.	How the multipurpose mixtures are evaluated?	BT-5	Evaluating
12.	Define Raoult's law.	BT-2	Understanding
13.	What is the purpose of Salwin –Slawson equation?	BT-4	Analysing
14.	State sorption isotherm.	BT-1	Remembering
15.	Assuming equilibrium, calculate the quantity of fresh adsorbent to be applied to one kg of juice, in order to reduce the concentration of the bitter substance from 20 mg/kg to 0.1 mg/kg, when equilibrium function is linear y = 0.00012x	BT-5	Evaluating
16.	How will you modify BET equation to find monolayer value?	BT-4	Analysing
17.	It has been reported that the rate of an enzymatic reaction is increased by a factor of 3.2 if the reaction is carried out at 45°C instead of 37°C. Calculate the energy of activation and the Q 10 value.	BT-3	Applying
18.	Write Norrish equation and explain the terms.	BT-2	Understanding
19.	State Ross equation.	BT-1	Remembering
20.	In what way,can you explain TDT curve?	BT-4	Analysing
21	How Arhenius equation influence heat interaction of food?	BT-4	Analysing
22	Demonstrate sterilization.	BT-1	Remembering
23	Differentiate sterilization and pasteurization.	BT-3	Applying
24	What is the purpose of blanching?	BT-3	Applying
25	Define canning.	BT-2	Understanding

PART – B

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Discuss the effect of water activity on foods.	BT-4	Analysing
2.	Elaborate retorting process related to food preservation.	BT-5	Evaluating
3.	Elaborate about evaluation of water activity in nonelectrolyte solutions.	BT-4	Analysing
4.	Detail the effect of temperature on reaction kinetics.	BT-3	Applying
5.	Demonstrate canning processes of food.	BT-3	Applying
6.	Elaborate about evaluation of water activity in multi component mixture food.	BT-4	Analysing
7.	Compare and differentiate sterilization, pasteurization and blanching.	BT-5	Evaluating
8.	Evaluate heat energy interaction with food components.	BT-5	Evaluating
9.	Analyse sorption behaviour of food.	BT-4	Analysing
10.	Brief about components of food with its importance.	BT-4	Analysing
11.	Explain the physical method of preservation of food.	BT-2	Understanding
12.	Differentiate cooking and canning of food.	BT-3	Applying
13.	Demonstrate BET isotherm model.	BT-3	Applying
14.	Elaborate GAB Model.	BT-2	Understanding
15.	Detail about various constituents of food and its application.	BT-5	Evaluating

16.	What do you understand about thermal processing of foods?	BT-4	Analysing
17.	Differentiate cooking and blanching process.	BT-4	Analysing

PART-C

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Briefly explain thermal processing methods of food.	BT-2	Understanding
2.	Differentiate various isotherm models.	BT-4	Analysing
3.	A dry food product has been exposed to a 30% relative-humidity environ-ment at 158C for 5 h without a weight change. The moisture content has been measured and is at 7.5% (wet basis). The product is moved to a 50%relative-humidity environment, and a weight increase of 0.1 kg/kg product occurs before equilibrium is achieved. a. Determine the water activity of the product in the first and second environments. b. Compute the moisture contents of the product on a dry basis in both environments.	BT-3	Applying
4.	Explain in detail about reaction kinetics in relation with heat interaction food.	BT-4	Analysing
5.	Elaborate TDT curves and its importance with neat sketch.	BT-4	Analysing

UNIT-IV: PROCESSING AND PRESERVATION OF FOODS **9**

Coffee, Tea processing - Concentration of foods, freeze concentration - osmotic and reverse osmotic concentration - drying and dehydration of food - Tray, tunnel, belt, vacuum and freeze dryers - rehydration of dehydrated foods - Fat and oil processing,sources, extraction, methods and equipment, refining of oils, hydrogenation, manufacture of margarine - Food preservation methods - preservation by irradiation, microwave and dielectric heating of food.

PART – A

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	Give the principles of food preservation.	BT-1	Remembering
2	Discuss the hysteresis effect during drying.	BT-3	Applying
3	Write short notes on manufacture of margarine.	BT-2	Understanding
4	Write the purpose of methylxanthines.	BT-4	Analysing
5	Which enzyme of tea plays key role in tea fermentation?	BT-4	Analysing
6	What are the composition of tea unprocessed tea leaf?	BT-1	Remembering
7	In what ways,microorganisms can be reduced in food?	BT-4	Analysing
8	Define withering and its types.	BT-2	Understanding
9	List the advantages of water quenching.	BT-2	Understanding
10	What are the steps involved in green bean processing?	BT-2	Understanding
11	How the water activity in food constituents can be controlled?	BT-4	Analysing
12	Write short notes on tea leaf processing.	BT-1	Remembering
13	How the aroma of coffee is recovered?	BT-3	Applying
14	Differentiate rehydration and drying of food.	BT-4	Analysing

15	Write the characteristics of green bean.	BT-2	Understanding
16	Give the name of dryers used in coffee processing.	BT-2	Understanding
17	What do you understand about refining of oils?	BT-4	Analysing
18	What is freeze concentration?	BT-5	Evaluating
19	Write short notes on dielectric heating.	BT-2	Understanding
20	List the merits of vacuum dryer.	BT-1	Remembering
21	Define asepsis.	BT-1	Remembering
22	State the term hydrogenation.	BT-2	Understanding
23	What are the effects of irradiation in food?	BT-5	Evaluating
24	Write various methods of fat and oil processing.	BT-1	Remembering
25	How microwave heating influences food preservation?	BT-3	Applying

PART B

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	Demonstrate coffee manufacturing process.	BT-5	Evaluating
2	Explain different microorganisms reduction methods.	BT-1	Remembering
3	Brief about osmatic and reverse osmatic concentration of food.	BT-2	Understanding
4	Elaborate black tea processing.	BT-2	Understanding
5	Demonstrate freeze dryer function with its components.	BT-4	Analysing
6	Brief about Chinese green tea processing with flow chart.	BT-1	Remembering
7	Explain in detail about margarine production process line.	BT-2	Understanding
8	Demonstrate fat and oil processing source and extraction process.	BT-3	Applying
9	Evaluate green bean processing technology.	BT-5	Evaluating
10	Study the influence of cold treatment methods in food.	BT-5	Evaluating
11	Demonstrate processing of partially fermented tea.	BT-4	Analysing
12.	Differentiate extraction and concentration process of coffee processing.	BT-4	Analysing
13	Brief about Polyphenols and Polyphenol oxidase activity in tea processing.	BT-4	Analysing
14	List the merits and demerits of margarine.	BT-1	Remembering
15.	Enumerate the relationship between drying and dehydration .	BT-5	Evaluating
16.	How will you determine rehydration ratio of dehydrated products?	BT-4	Analysing
17.	Differentiate microwave and dielectric heating of food.	BT-3	Applying

PART – C

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	Elaborate various food preservation methods.	BT-2	Understanding
2	Compare and contrast Chinese and Japanese green tea manufacturing process.	BT-3	Applying

3	Evaluate the water activity in food constituents and how it can be controlled?	BT-5	Evaluating
4.	Compare and differentiate tray ,tunnel and belt dryers.	BT-4	Analysing
5.	Detail the procedure for refining of oil.	BT-2	Understanding

UNIT-V: PACKAGING AND QUALITY CONTROL **9**

Food packaging, importance, flexible pouches - retort pouches – aseptic packaging, granules, powder and liquid packaging machines - nanotechnology - principles - applications in food processing - food plant location - Quality control of processed food products - Factors affecting quality.

PART – A

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	What is food packaging?	BT-1	Remembering
2	How we can do effective food packaging?	BT-3	Applying
3	List Basic functions of packaging.	BT-2	Understanding
4	Define aseptic packaging.	BT-2	Understand
5	How the shelf life is related to packaging?	BT-3	Applying
6	Identify the packaging system used for beverages.	BT-3	Applying
7	Write any 2 difference of aseptic and active packaging.	BT-4	Analysing
8	Write short notes on retort pouch.	BT-2	Understanding
9	How nanotechnology influences food packaging?	BT-4	Analysing
10	In what way,food quality control can be done?	BT-4	Analysing
11	List the machines used for granules and powder packaging.	BT-1	Remembering
12	Define nanotechnology.	BT-2	Understanding
13	Which types of materials can be used for fruit packaging?	BT-3	Applying
14	Write short notes on flexible pouch.	BT-1	Remembering
15	State the criteria for food plant location.	BT-2	Understanding
16	What are the principles of nanotechnology?	BT-1	Remembering
17	Give the name of various types of layout.	BT-1	Remembering
18	Write the flexible pouches importance in food industry.	BT-3	Applying
19	What are the components of liquid packaging machine?	BT-3	Applying
20	Give any 5 application of nanotechnology in food processing.	BT-2	Understanding
21	List out the factors affecting food quality.	BT-2	Understanding
22	What are the uses of nanotechnology in food industry.	BT-1	Remembering
23	Brief about nanotube.	BT-2	Understanding
24	Why do we need Material Index?	BT-3	Applying
25	What are the steps involved in facility location of food plant.	BT-1	Remembering

PART-B

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1	Explain in detail about food packaging functions.	BT-2	Understanding
2	List out the requirements for effective food packaging.	BT-2	Understanding
3	Elaborate nano materials.	BT-1	Remembering
4	Write short notes on nano structures.	BT-2	Understanding
5	Explain cellular layout with its merits.	BT-2	Understanding

6.	Brief about granules packaging machine.	BT-1	Remembering
7	Write short notes on liquid packaging machine.	BT-1	Remembering
8	How retort pouch quality is assured?	BT-3	Applying
9	Explain in detail about nanotechnology in food processing.	BT-3	Applying
10	Differentiate and compare nanostructures and nanomaterials.	BT-3	Analysing
11	Brief about process line layout.	BT-2	Understanding
12	Explain the steps involved in locating food plant with flow chart.	BT-2	Understanding
13	List out the applications of nanotechnology in food processing.	BT-1	Remembering
14	Study the various factors to be considered for food plant location.	BT-3	Applying
15	Compare and contrast flexible and retort pouches.	BT-4	Analysing
16	Write short note on aseptic packaging.	BT-2	Understanding
17	Explain with case study about food plant location.	BT-4	Analysing

PART – C

Q.NO	QUESTIONS	BT LEVEL	COMPETENCE
1.	Compare and contrast granules, powder and liquid packaging machine functions.	BT-4	Analysing
2.	Detail about retort pouch manufacturing,filling and sealing.	BT-2	Understanding
3.	Elaborate various layout of food plant location.	BT-2	Understanding
4.	Demonstrate the factors affecting food quality.	BT-1	Remembering
5.	How the quality control of processed food products can be assessed?	BT-5	Evaluating