

# **SUGGESTIVE QUESTION BANK**

## **M.Voc. in Food Technology, Nutrition and Management** **Semester – I**

### **FTNM11: FUNDAMENTALS OF FOOD TECHNOLOGY-I**

**Unit-1:** Status of food processing industry in India and abroad; prospects and constraints in development of Indian food industry.

- 1 What is the current status of the food processing industry in India?
- 2 How does the food processing industry in India compare to the global food industry?
- 3 What are the key prospects for the development of the Indian food industry?
- 4 What are the major constraints or challenges faced by the Indian food processing industry?
- 5 How has globalization affected the Indian food processing industry?
- 6 What role does technology play in the development of the food industry in India?
- 7 What are the government policies and initiatives supporting the food processing industry in India?
- 8 How does the Indian food industry contribute to employment and economic growth in the country?
- 9 What are the opportunities for foreign investment in the Indian food processing sector?
- 10 How can the Indian food industry address issues related to food safety and quality?

**Unit-2:** Basic principles of food processing & preservation: Food spoilage: microbial, physical, chemical & miscellaneous. Thermal processing methods and preservation: heat resistance of microorganisms, thermal death curve. Blanching, pasteurization, sterilization. Canning of foods, heat penetration. Moisture removal by evaporation, drying, and concentration-principle, methods, equipment (Tray drier, roller drier, spray drier, fluidized bed drier, freeze drier and solar drier) and effect on product's quality. Drying curve. Preservation by salt and sugar: Pickling, fermentation, intermediate moisture foods. Hurdle technology: Types of preservation techniques and their principles, concept of hurdle technology and its application.

#### **Food Spoilage:**

- 1 What are the different types of food spoilage, and how do microbes contribute to it?
- 2 Explain the physical factors that can lead to food spoilage.
- 3 How do chemical reactions impact food spoilage, and what are some common chemical spoilage agents?
- 4 What miscellaneous factors can cause food spoilage, and how can they be controlled?

#### **Thermal Processing Methods and Preservation:**

- 5 Describe the concept of heat resistance in microorganisms. How is it measured?
- 6 Explain the thermal death curve and its significance in food preservation.

- 7 Compare and contrast blanching, pasteurization, and sterilization as thermal processing methods.
- 8 What is the canning process, and how does it ensure food preservation? Discuss heat penetration in canning.

**Moisture Removal by Evaporation, Drying, and Concentration:**

9. What is the principle behind moisture removal in food preservation?
10. Describe different methods and equipment used for drying foods, such as tray dryer, roller dryer, and spray dryer.
11. Explain the effects of different drying methods on the quality of the final food product.
12. What is a drying curve, and how is it useful in food preservation?

**Preservation by Salt and Sugar:**

13. How do salt and sugar contribute to food preservation, and what is pickling?
14. Describe the process of fermentation in food preservation and provide examples.
15. What are intermediate moisture foods, and how are they preserved using sugar and other techniques?

**Hurdle Technology:**

16. What is hurdle technology in food preservation, and what are its underlying principles?
17. Name different types of preservation techniques associated with hurdle technology.
18. Provide examples of how hurdle technology can be applied to preserve specific food products.

**Unit-3:**Principles of food engineering: Sterilizers and accessories used in canning industries; Seaming machine. Construction of cold storage; Different types of freezers including plate contact freezer, air blast freezer, cryogenic freezing and refrigerated vans.

**Sterilizers and Accessories in Canning Industries:**

1. What are the key principles behind the operation of sterilizers in canning industries?
2. Explain the role and importance of accessories used in canning, such as steam traps and pressure gauges.
3. How does a seaming machine work, and what is its significance in the canning process?

**Construction of Cold Storage:**

4. Describe the construction of a cold storage facility, including key components and materials used.
5. What are the considerations for temperature and humidity control in cold storage?
6. How does cold storage contribute to the preservation and storage of perishable foods?

**Different Types of Freezers:**

7. Compare and contrast plate contact freezers, air blast freezers, and cryogenic freezing in terms of their operating principles and applications.
8. What are the advantages and disadvantages of each type of freezer for various food products?
9. How do refrigerated vans differ from stationary freezers, and what role do they play in the food supply chain?

**Unit-4:** Food additives and ingredients: Food additives, preservatives, antioxidants, colours and flavours (synthetic and natural), emulsifiers, sequesterants, humectants, hydrocolloids, sweeteners, acidulants, buffering salts, anticaking agents; food flavours, flavour enhancers, their properties and toxicity, analysis of flavours, extraction techniques of flavours, Proteins, starches and lipids as functional ingredient, Spices- pepper, cinnamon, turmeric, fennel, chilli, cardmom (small and big), cumin, mint, ginger, cloves and fenugreek. Condiments- definition. Spice oleoresins, spice essential oils, encapsulated spices (Brief)

**Food Additives, Preservatives, and Antioxidants:**

1. What are food additives, and why are they used in the food industry?
2. Explain the role of preservatives in food products. What are some common preservatives?
3. How do antioxidants help in food preservation and quality maintenance?

**Colors and Flavors:**

4. Differentiate between synthetic and natural food colors and flavors.
5. What is the purpose of emulsifiers in food products, and how do they work?
6. Explain the functions of sequestrants, humectants, and hydrocolloids in food processing.
7. Provide examples of synthetic and natural sweeteners used in the food industry.

**Acidulants, Buffering Salts, and Anti-Caking Agents:**

8. What are acidulants, and how are they employed in food products?
9. Describe the role of buffering salts in maintaining pH in food processing.
10. How do anti-caking agents prevent clumping in food products?

**Food Flavors and Flavor Enhancers:**

11. What are food flavors, and what distinguishes them from flavor enhancers?
12. Discuss the properties and potential toxicity of food flavors.
13. How are flavors analyzed, and what extraction techniques are commonly used in the food industry?

**Proteins, Starches, and Lipids as Functional Ingredients:**

14. Explain how proteins, starches, and lipids can function as functional ingredients in food products.
15. Provide examples of how these components are used to enhance the quality of food.

**Spices and Condiments:**

16. Describe the key characteristics of various spices, such as pepper, cinnamon, and ginger.
17. What are spice oleoresins, and how are they different from spice essential oils?
18. Briefly explain the concept of encapsulated spices.
19. Define condiments and their role in enhancing the flavor of food.

**Unit-5:** Cereal and pulse processing technology: Rice: paddy processing and rice milling, quality characteristics influencing final milled products. Parboiling: rice bran stabilization and its methods; Aging of rice; Enrichment – need, methods; processed foods from wheat: break system, purification system and reduction system; extraction rate and its effect on flour composition; Quality characteristics of flour and their

suitability for baking. Corn: corn milling – dry and wet milling, starch and gluten separation, milling fractions and modified starches. Barley: malting and milling; Sorghum: milling, malting, pearling and industrial utilization; Millets: importance of millet, composition, processing of millets for food uses, major and minor millets; Classification and types of legumes, anti-nutritional compounds in legumes; methods of removal of anti-nutritional compounds, milling of legumes: home scale, cottage scale and modern milling methods, milling quality, efficiency and factors affecting milling; problems in dhal milling industry, Soaking and germination of pulses, Cooking quality of legumes – factors affecting cooking quality, Byproduct of pulses and their value addition.

### **Rice Processing:**

1. What are the key steps involved in paddy processing and rice milling?
2. Explain the quality characteristics that influence the final milled products in rice processing.
3. Describe the process of parboiling in rice processing and methods of rice bran stabilization.
4. How does aging affect the quality of rice, and why is it done?
5. Why is enrichment of rice necessary, and what methods are used for enrichment?
6. Name some processed foods made from wheat and explain the role of break system, purification system, and reduction system in wheat processing.
7. How does the extraction rate in wheat milling affect flour composition, and what are the quality characteristics of flour suitable for baking?

### **Corn, Barley, Sorghum, and Millet Processing:**

8. Differentiate between dry milling and wet milling in corn processing. What are the key products obtained from each method?
9. Explain the process of starch and gluten separation in corn milling.
10. What are the milling fractions and modified starches in corn processing?
11. Discuss malting and milling in barley processing.
12. What are the different methods of processing sorghum, including milling, malting, and pearling?
13. Why are millets important, and what are the major and minor types of millets?

### **Legumes and Anti-Nutritional Compounds:**

14. What is the classification of legumes, and what are anti-nutritional compounds in legumes?
15. Describe methods for the removal of anti-nutritional compounds from legumes.
16. Explain the different milling methods for legumes, including home scale, cottage scale, and modern methods.
17. What factors affect milling quality, efficiency, and the overall milling process for legumes?
18. What are the common problems faced in the dhal milling industry?

### **Pulse Processing:**

19. How does soaking and germination affect the quality and nutritional value of pulses?
20. What factors influence the cooking quality of legumes, and how can it be improved?

21. Name some byproducts of pulse processing and suggest ways to add value to them.

**Unit-6:** Milk and milk product technology: In India and West Bengal quantity of annual milk production, production growth rate and per capita availability, status of quantity of milk production of different states, Anand pattern, NDDDB, operation flood, contribution of Kurien. clean milk production, processing of market milk, UHT milk, flavoured milk, dahi, yoghurt, cream, butter, butter oil and ghee, ice cream, condensed and dried milk, malted milk powder, infant milk food, cheese (Cheddar, Swiss, mozzarella, cottage, processed cheese, cheese spread), khoa, gulabjamun, channa, rasogolla, paneer, dairy by-products, CIP.

### **Milk Production and Dairy Industry Overview:**

1. What is the annual quantity of milk production in India and West Bengal?
2. Describe the production growth rate and per capita availability of milk in India.
3. Explain the status of milk production in different states of India.
4. What is the Anand pattern, and how did the National Dairy Development Board (NDDDB) and Operation Flood contribute to the dairy industry in India?
5. Discuss the significant contributions of Dr. Verghese Kurien to the Indian dairy sector.

### **Milk Production and Processing:**

6. What are the key principles and practices of clean milk production?
7. Describe the processing of market milk and the techniques involved.
8. What is UHT milk, and how is it produced?
9. Explain the production process of flavored milk.
10. Discuss the methods used in making dahi, yogurt, cream, butter, butter oil, and ghee.
11. Provide an overview of the production process for ice cream.
12. Describe the production of condensed and dried milk.
13. Explain the manufacturing of malted milk powder and infant milk food.

### **Cheese and Other Dairy Products:**

14. Name different types of cheeses, including Cheddar, Swiss, mozzarella, cottage, and processed cheese.
15. What is cheese spread, and how is it made?
16. Describe the production process of khoa, gulabjamun, channa, rasogolla, and paneer.
17. What are dairy by-products, and how are they utilized in various applications?
18. Explain the concept of Clean-in-Place (CIP) in the dairy industry and its importance.

**Unit-7 :**Meat, poultry & fish processing technology: Structure of meat, muscle protein, composition of meat, Rigor mortis, post mortem changes in meat, meat slaughtering process, meat products, meat preservation, meat plant sanitization & waste disposal, meat byproducts. Processing of poultry meat, classification & composition of poultry meat, egg processing & egg products, fish processing & fish products.

**Meat Processing:**

1. What is the structure of meat, and what are the key components of muscle protein?
2. Explain the composition of meat and the role of various components in its quality.
3. What is rigor mortis, and how does it affect meat quality?
4. Describe the post-mortem changes in meat and their impact on meat characteristics.
5. Walk through the meat slaughtering process and highlight key steps.
6. Name some common meat products derived from different parts of the animal.
7. How is meat preserved to maintain its quality and safety?
8. Discuss the importance of meat plant sanitization and waste disposal in meat processing.
9. What are meat byproducts, and how are they used in various industries?

**Poultry Meat Processing:**

10. Classify poultry meat and describe its composition.
11. Explain the egg processing process and the variety of egg products.
12. How is poultry meat processed, and what are the key considerations for quality and safety?

**Fish Processing:**

13. Detail the fish processing techniques and the various fish products that result from them.