

**Syllabus  
for  
Food Science and Technology  
(SCQP12)**

**Note:**

- i. *The Question Paper will have 75 questions.*
- ii. *All questions will be based on Subject-Specific Knowledge.*
- iii. *All questions are compulsory.*
- iv. *The Questions will be Bilingual (English/Hindi).*

## **Food Science and Technology (SCQP12)**

### **INTRODUCTION TO FOOD SCIENCE AND TECHNOLOGY:**

Definition, scope and current trends in food science and technology. Food Groups, Nutrients and Balanced Diet. Definition and meaning of food, nutrition, nutrient, health, concept and characteristics of a balanced diet.

Introduction to basic food groups and nutrients, food pyramid, macro and micronutrients. Effect of processing on nutrients. Browning reactions in foods. Classification (enzymatic, non-enzymatic and metallic browning), causes and prevention of browning

#### **Cereals and Pulses**

Composition and nutritive value, types of cereals, processing of cereals and pulses (gelatinization of starch and the factors affecting it, germination and fermentation), toxic constituents in pulses, milling of pulses.

#### **Fruits and vegetables**

Classification of fruits and vegetables, composition and nutritive value; effect of processing on pigments.

#### **Chocolate and cocoa products**

Cocoa bean processing, preparation of chocolate liquor, cocoa butter and chocolate.

### **THEORY**

#### **Milk and milk products**

Composition and nutritive value.

Introduction to liquid milk technology (clarification, pasteurization, homogenization, fortification, sterilization), Types of milk, Effect of processing on milk, Introduction to milk products.

#### **Eggs**

Composition and nutritive value. Structure of an egg. Egg quality and deterioration. Green ring formation in boiled egg, preservation of eggs. Egg foams – stages of preparation and factors affecting them. Effect of heat on egg proteins; functions of eggs in cookery.

#### **Meat, Fish and Poultry**

Composition and nutritive value. Selection/purchasing criteria for meat, fish and poultry. Tenderization of meat.

#### **Sugar**

Composition and nutritive value. Properties of sugars. Manufacturing/refining of sucrose. Sugar cookery – crystalline and non-crystalline candies, sugar-based products.

#### **Fats and oils**

Composition and nutritive value. Types of fats/oils and their functions. Rancidity in fat and its prevention. Changes in fat during heating. Care of fat used for frying, emulsions.

### **Introduction to food hygiene and food adulteration**

Food hygiene, factors affecting food safety, personal hygiene. Adulteration, adulterants and their effects on health.

## **BASIC BAKING TECHNOLOGY**

Baking Industry and its scope in the Indian economy. History of Bakery - present trends, prospects Nutrition facts of bakery products.

### **Wheat Grain Technology**

Wheat grain- its structure. Milling of wheat; types of refined wheat flour; composition of refined wheat flour (gluten, amylose/ amylopectin, enzyme activity, moisture) and its storage.

### **Cake Technology**

Preparation of cakes - types of cakes; ingredients used; methods of batter preparation; steps in cake making; balancing of cake formula; evaluation of the baked cake; operational faults in cake processing and the remedial measures. Labeling and Packaging. Costing

Cake decoration- different methods of cake decoration

### **Pastry Technology**

Preparation of pastry - types of pastries (short crust, puff/flaky and choux pastry); ingredients; processing and evaluation. Faults and remedies

## **INTRODUCTION TO FOOD SAFETY AND PRESERVATION**

Purpose and Scope of Preservation. Objectives of preservation and processing. Scope of preservation industry in India. Post-harvest Changes and Spoilage. Physical, chemical and microbiological changes in fruits and vegetables. Factors affecting growth of microorganisms and the control measures

### **Food Safety**

Key terms, factors affecting food safety, recent concerns.

Food laws, standards and regulations. Food additives and contaminants. Hygiene and sanitation

### **Principles and Methods of Preservation**

Asepsis. Use of low temperature, Use of high temperature. Removal of moisture. Removal of air, Use of chemical preservatives. Fermentation. Irradiation. Gas preservation. Newer methods

### **Fruit and Vegetable Processing**

Sauces and Beverages. Chutney and sauces- definition, method of preservation, steps in preparation of chutney and sauces. Fruit beverages- definition and classification, method of preservation (with special emphasis on pasteurization, use of chemical preservatives, sugar), role of various ingredients.

## **ADVANCED BAKING TECHNOLOGY**

Bread Technology. Preparation of bread - ingredients used; methods of dough preparation; steps in bread processing; evaluation of the baked bread; staling of bread; diseases of bread.

### **Biscuit and Cookies Technology**

Preparation of biscuits and cookies – types; ingredients; processing and evaluation. Crackers

### **Food Packaging**

Packaging – its importance, essential features of an ideal package; various food packaging materials and their characteristics recent trends in the field of packaging (active packaging, intelligent packaging, RFID) label regulations and designing for packaged foods, nutritional labelling.

### **Marketing and Cost Control**

Marketing - definition, scope, understanding the 4Ps – (Product, Price, Place, Promotion), marketing techniques, marketing and distribution of processed products. Cost control – food cost, labor cost and other costs; costing of processed products.

## ADVANCED FRUIT AND VEGETABLE PRESERVATION TECHNOLOGY

### **Dehydration and Concentration –**

Definition and objectives, method of preservation, normal dryingcurve, water activity, factors affecting rate of drying, sun drying, types of dehydrators (air convection, drum, freeze and vacuum driers) steps in dehydration of fruits and vegetable.

Concentration- definition and objectives, techniques

### **Refrigeration and Freezing**

Definition and objectives, difference between freezing and refrigeration, systems of refrigeration,method of preservation, steps in freezing fruits and vegetables, cryogenic freezing of fruits and vegetables, evaluation.

### **Canning**

Definition and objectives, selection of fruits and vegetables, method of preservation, steps ofcanning fruits and vegetables (with special emphasis on blanching, exhausting and heat processing), spoilage of canned foods.

### **Introduction to New Food Product Development**

Need and importance for developing a new product, types of new products, challenges, failure of new product. Fruit and Vegetable Processing –Pectin Products Preserves and Pickles. Jam, Jelly andMarmalade- definition, role of pectin and theory of gel formation, method of preservation, steps of preparation, evaluation. Preserves- definition, method of preservation, steps of preparation, evaluation, candied, crystallized and glazed fruits. Pickles- definition, classification, method of preservation, steps of preparation of vinegar pickles, evaluation.

## FOOD SAFETY, HYGIENE AND QUALITY TESTING

Food Laws and Regulations. Introduction to food acts laws and standards. National food safety andstandard act. International standards, regulatory agencies. Consumer protection act

### **Food Quality Management**

Characteristics of quality. Quality Control, Quality Assurance. Total Quality Management. Quality Management System. Good Manufacturing Practices. Hazard Analysis Critical Control Point System

### **Introduction to Food Safety and Hygiene**

Food hygiene. Factors affecting food safety. Food spoilage. Food handling. Special requirements for high-risk foods, Safe food cooking temperature and storage techniques.

### **Hygiene and Sanitation in Food Service Institutions**

Cleaning and disinfection. Personal hygiene. Pest control. Waste disposal

### **Sensory Methods of Food Quality Testing**

Sensation of taste, smell, appearance and flavor, sensory evaluation techniques

### **Objective Methods of Food Quality Testing**

Physical test methods (moisture, acidity, water activity, texture, viscosity, color) Simple methods of chemical analysis (protein, fat, water, ash). Microbiological sampling and testing.