

**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 drying curve, 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 of canning 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 and Marmalade- 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 and standard 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.