# DETAILED SYLLABUS FOR THE POST OF FOOD SAFETY OFFICER IN FOOD SAFETY DEPARTMENT

(Cat. No.: 006/2024)

**(Total Marks – 100)**

## I . Food Technology - (20 Marks)

Principles and methods of food preservation - Heat processing, pasteurization, canning, dehydration, freezing, freeze drying, fermentation, microwave, irradiation and chemical preservatives - Aseptic preservation, hurdle technology, hydrostatic pressure technology, microwave processing, microfiltration, bactofugation, ultra high voltage electric fields, pulse electric fields, high pressure processing, irradiation, thermosonication, ohmic heating, dielectric heating, infrared, induction heating, antibacterial and bacteriocins. Food fortification. Food additives. Classification, composition, manufacture, packaging, storage and defects of tomato products, other convenience foods from fruits and vegetables, beverages - tea, cocoa and coffee - pickles, chutney, sauces, spices, jam, jelley, marmalade, health drinks, restructured fruits and vegetables, preparation of fruits and vegetables, minimally processed products and Individually Quick Freezed products. Milling, processing, composition, structure, product development and byproduct utilization of cereals, pulses, millets and oil seeds. Antinutritional factors. Instant ready mixes. Packaging - materials and methods. Nutritional labeling of food. Quality control - systems and tools. Food plant sanitation. Food hygiene. Environment and waste management. Total quality management, good management practices, HACCP and codex alimentarius commission.

## II . Dairy Technology - ( 20 Marks)

Composition of milk- Physico - chemical properties of milk- milk hygiene- milk microbiology - Market milk: collection of milk- cooling and transportation– filtration/clarification- standardization- homogenization - pasteurization- UHT -

sterilization- packaging. Tests for milk quality and detection of adulterants- dairy plant and equipment hygiene and sanitation. Definition, classification, composition, outline of manufacture, packaging, storage and defects of the following milk products: Cream, Malai, Dahi /Curd, yoghurt, Channa / Paneer, Cheese, Ice cream , Frozen desserts, Evaporated milk, Condensed milk, Milk powder, Butter, Ghee, Chakka and Shrikhand, Indigenous milk products. Foods for infant nutrition . Whey products, Edible casein products.

**III . Veterinary Sciences - ( 20 Marks)**

Standards for organization and layout of abattoirs, handling and transport of meat animals including poultry. Ante mortem and post mortem examination. Scientific slaughtering and dressing of carcasses. Evaluation, grading and fabrication of dressed carcasses including poultry. Fraudulent substitution of meat, preservation of meat and aquatic foods. Ageing of meat. Packaging of meat and meat products. Physico-chemical and microbiological quality of meat and aquatic food and food products. Organic meat food products. Food products of genetically modified animals and marine origin. Meat as a source of disease transmission. Physical, chemical nutritional and functional characteristics of egg. Processing of Egg and egg products. Preservation and storage of egg.

**IV . Nutritional Biochemistry and Food Analysis - ( 20 Marks)**

Chemical composition of food: Carbohydrates, lipids, proteins, fiber, vitamins, and minerals – characteristics, sources, physiological and biochemical functions, daily requirement, digestion and absorption. Biological value of proteins (BV), Protein efficiency ratio (PER), Digestability coefficient, Net protein Utilization, Net Protein Ratio(NPR), Chemical Score, Free Radicals and Antioxidants**.** Energy value of foods, Respiratory Quotient (RQ), Determination of Basal Metabolic Rate (BMR), Determination of energy metabolism during work, Energy expenditure for various types

of activities, Recommended Daily Allowance (RDA), Specific Dynamic Action (SDA) of foods, Balanced diet formulation. Analytical techniques used in detection of adulteration of food: Principle, procedure and detectors of chromatographic techniques (Column, paper, TLC, HPLC and GC), Spectroscopic techniques (IR, UV, MS and AAS). Food Analysis – moisture content, ash, fat, carbohydrate, crude fibre, crude protein, sodium, potassium, calcium, and phosphates. Food adulteration: common adulteration, contamination and pesticide analysis. Oils and Fats - Iodine value and saponification value.

**V . Microbiological, Biotechnological and Medical aspects - ( 20 Marks)**

Microscopy, staining and culture techniques, sterilization techniques, culture media, factors influencing microbial growth, growth curve, thermal death time and thermal death points, D-value, Z- value. Sources of microorganisms in food, perishable, semi perishable and non-perishable foods, intrinsic and extrinsic parameters influencing microbial content of food, Food spoilage-types, causes and indications. Control of spoilage-pre-harvesting and post harvesting food processing. **Food Borne Diseases:** Definition , Classification ( Food borne intoxications & Food borne infections), neurolathyrism, aflatoxins, Ergotism, Epidemic dropsy, Typhoid fever, Salmonellosis, Staphylococcal intoxication, Botulism, Bacillus cereus food poisoning, *E.coli* diarrhea, Cholera, Shigellosis, Brucellosis, **Food poisoning:** Types of food poisoning, method of investigation of food poisoning, prevention and control- food sanitation, refrigeration, surveillance. **Food handlers:** medical examination of food handlers, infections transmitted by food handlers, education of food handlers. **Adulteration of foods:** Health hazards. **Sanitation of eating places:** minimum standards, storage of uncooked foodstuffs, waste disposal, water supply and washing facilities. Fermented foods- types, production, organisms involved, advantages and disadvantages, spoilage of fermented foods. Microbiological analysis of food and water- qualitative and quantitative, indicator organisms, coliforms, detection of pathogens, molecular techniques for detection of microbes. Microbiological standards of food and water. Water purification for domestic

and municipal purposes. Sewage treatment. Application of enzymes in food industry, production of food flavor and colour. Enzyme immobilization and applications. Use of amylase, invertase, protease, pectinase and cellulase in food industries. Bioreactors. Single-Cell Proteins. Molecular detection of food contamination. Genetically modified food and their labelling.

**NOTE: - It may be noted that apart from the topics detailed above, questions from other topics prescribed for the educational qualification of the post may also appear in the question paper. There is no undertaking that all the topics above may be covered in the question paper.**