Syllabus for the post of Assistant Commissioner Food Safety

(i) **Food Laws and Standards in India*:**

a. Food Safety and Standards (FSS) Act, 2006, FSS Rules and Regulations,
b. Agricultural Produce Act, 1937 (Grading and Marketing)
c. Export (Quality Control & Inspection), Act, 1963 and Rules
d. Bureau of Indian Standards relevant to food safety
e. Legal Metrology Act
f. International Food Control Systems/ Laws, Regulations and Standards/ Guidelines with regard to Food Safety: CODEX (SPS/TBT), OIE, IPPC.

*80% weightage may be given to (a.) and 20% to other (b to f) above while framing the questions.

(ii) **Planning Organization and set up of Food Analyst Laboratory including NABL/ ISO/IEC-17025:2005**

(iii) **Principles of Food Preservation, Processing and Packaging, Labeling/Claims and Principles of Nutrition**

a. Food preservation and processing their principles, methodology and technology.
b. Principles of Packaging and various Food Packaging materials: rigid and flexible such as plastic films, metal containers, glass containers, paper and card board containers, jute containers, etc.
c. Basic principles of nutrition and role of various nutrients in human metabolism; Essential amino acids and fatty acids, Protein Efficiency Ratio (PER), Nutrition deficiency diseases.
d. Labelling requirements as per Food Safety Standards (Packaging and Labelling) Regulations,2011

(iv) **Food Hygiene and Sanitation, HACCP, Quality Control Tools, GLP, GHP, GMP and FSMS**

(v) FOOD CHEMISTRY AND FOOD ADDITIVES, CONTAMINANTS AND ADULTERANTS:

Food Chemistry

a. Knowledge of Basic chemistry of major food components- Water, Carbohydrates, Protein and Fats; definition, composition, structure, functional properties, their behaviour under conditions of particular relevance to food processing.
b. Chemistry of Macronutrients and Micronutrients (Majorly Vitamins and Minerals); Food Pigments, Food flavors, Enzymes, Enzymatic and non-enzymatic browning; Water soluble and Fat soluble vitamins, Role of minerals in nutrition, Anti-nutrients
c. Standards of Quality and Safety of Food & Food Products laid down in the FSS Regulations, 2011 including current food safety issues like Antibiotic residues in Honey, Milk, Fish, Meat and Poultry products.
d. Nutraceuticals, Functional Foods, Food Supplements, Dietary Supplements, Genetically Modified Foods.

Food Additives, Antioxidants, Contaminants and Adulterants:

a. **Analytical Chemistry**: Statistical Analysis, Standard Deviation, Sampling Procedures, General Description on " Sampling of Foods", Calibration and Standardization, Sub- Sampling and its procedures, LOD, LOQ, Internal standards, Quality Assurance, Setting-up of Food Laboratory, Reference standards, Certified Reference Materials etc.
    i. Theory of common test; pH Meter, Digital Analyzer, Auto-Analyzer etc
    ii. Food composition and proximate analysis of foods

b. **Food additives**: Chemistry, role and application of Preservatives, Emulsifying and Stabilizing agents, buffering agents, bleaching, maturing agents and starch modifiers, Food colors, flavors, anti-caking agent, Antioxidants etc.

c. **Food contaminants**: Their occurrence, composition, physiological, significance in foods, Limit of Detection and Limit of Quantification and detection.
    i. Metals and toxic Metals e.g. Cd, Hg etc.
    ii. Pesticide residues e.g. Dioxin, Aldrin, Malathion etc.
    iii. Mycotoxins, Argemone, Khesari dal, Ergot, Karnal bunt, Dhatura, etc.
    iv. Allergens, Antibiotic & hormone residues, Veterinary drug residue, other new contaminants and toxins (For example: Cyclopiazonic acid in Buckwheat flour)
    v. Naturally Occurring Toxic Substances (NOTS) and Deoxynivalenol (DON)

(vi) FOOD MICROBIOLOGY

a. Food Microbiology, food spoilage organism and their control, microbiology of dairy products, Fruits and Vegetables and their processed Products ,Meat and Meat products, fish and fish products, egg and egg products, spices & condiments, food borne intoxicants and infection.

b. Microbial Contaminants (For example: Bacteria, Yeasts and Molds) their composition, physiological, significance in foods and detection thereof.

(vii) INSTRUMENTATION IN FOOD ANALYSIS:

a. Instrumentation and methods of analysis of food products.
   i. Chromatography, including GLC, TLC, Paper & Column, LC-MS-MS, GC-MS-MS, HPLC, AAS, ICP-MS
   ii. UV-Vis Spectrophotometer, IR-Spectrophotometer and Fluorescence Spectrophotometer

b. Atomic Absorption spectroscopy for determination of heavy metal contaminants in foods such as Lead, Cadmium, Mercury, Arsenic, Zinc, Copper, Tin, etc.

c. Microbiological instrumentation- Colony counters, Bacteriological incubators, Bio safety Cabinets, etc.

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