

**PLAN AND SYLLABUS FOR THE 4<sup>TH</sup> FOOD ANALYST EXAMINATION 2017 (4<sup>th</sup> FAE, 2017)**  
**AND**  
**1<sup>ST</sup> JUNIOR ANALYST EXAMINATION 2017 (1<sup>st</sup> JAE, 2017)**

**PLAN FOR EXAMINATION**

<b>Session-I</b>		<b>LUNCH BREAK: 12 NOON to 1 PM (1 Hour)</b>	<b>Session II</b>	
<b>Paper- I (Total 100 Questions)</b> 10:00 AM to 12:00 NOON (2 hours)			<b>Paper-II (Total 100 Questions)</b> 01:00 PM to 03:00 PM (2 hours)	
<b>Topics</b>	<b>Weightage (%)</b>		<b>Topics</b>	<b>Weightage (%)</b>
- Food Laws and Standards in India	40		- Food Chemistry, Food Additives, Antioxidants, Contaminants and Adulterants	30
- Planning Organization and set up of Food Analyst Laboratory including NABL / ISO / IEC-17025: 2005	10		- Food Microbiology	30
- Principles of Food Preservation, Processing and Packaging, Labeling/Claims and Principles of Nutrition	25	- Instrumentation in Food Analysis	40	
- Food Hygiene and Sanitation, HACCP, Quality Control Tools, GLP, GHP, GMP and FSMS.	25			

- Both theory papers viz. Paper-I and Paper- II are compulsory for all candidates appearing for 4<sup>th</sup> FAE, 2017 and 1<sup>st</sup> JAE, 2017.
- All questions will be Multiple Choice Questions (MCQ) and each question will carry four marks. There will also be negative marking for incorrect answers
- Four marks will be awarded for each correct answer and one mark will be deducted for each incorrect answer.
- The candidates should secure atleast 35% in each theory paper (Paper-I and Paper-II) separately with minimum aggregate of 40% in both papers.
- The candidates of 4<sup>th</sup> FAE who qualify in Paper-I and Paper-II (Theory Papers) will only be allowed to appear in Paper-III (Practical). Dates, venue and syllabus of Practical examination will be intimated separately.
- Candidates of 1st JAE who qualify in paper-I and paper-II (Theory papers) will be awarded certificate of qualified Junior Analyst.
- Syllabus for Paper I and Paper II is enclosed at **Annexure- I**.

**SYLLABUS FOR 4<sup>TH</sup> FAE 2017 AND 1<sup>ST</sup> JAE 2017**

**THEORY PAPERS**

**PAPER- I: Food Laws and Standards in India, Planning Organization and set up of Food Analyst Laboratory Including NABL/ISO/IEC-17025:2005 Accreditation**

**(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**

## **PAPER – II: Food Chemistry, Food Microbiology, Food Additives & Contaminants and instrumentation in food analysis**

### **(i) 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)

### **(ii) 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.

**(iii) 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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