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**DEPARTMENT OF FOOD TECHNOLOGY**

**Syllabus Ph.D. Entrance Test**

1. **FOOD CHEMISTRY**

Introduction to carbohydrates- classification & structure of carbohydrates, Chemical reactions of carbohydrates (Maillard reaction, caramelization), Importance of Proteins, Classification, Structure and chemistry of amino acids, Peptides & proteins, Lipids- Rancidity of oils and fats. Properties of carbohydrates, proteins and lipids.

1. **FOOD MICROBIOLOGY**

Control of microorganisms in Food, Useful Micro-organism in food Industry, Antimicrobial Preservatives- Bacteriosins, Prebiotic and Probiotic foods, techniques for detecting Food contamination by microbes.

1. **UNIT OPERATIONS IN FOOD PROCESSING**

Grading, cleaning, sorting grading, drying, pasteurization and sterilization of liquid foods, size reduction, mechanical separation, sedimentation, pressing, expelling, leaching, extraction, palleting and extrusion

1. **FOOD SAFETY AND QUALITY CONTROL**

Importance and type of sampling, analysis of moisture, carbohydrates, fats and proteins, Principles and concepts of HPLC, GC, GC-MS, NIR, Atomic Spectrophotometry and pH meter, Viscometer, Rheometer, Barometers, Moisture meters, Texture analyzer, Nondestructive analytical equipment; Good manufacturing practices, ISO 22000 regulations, FSSAI, HACCP.

1. **FUNCTIONAL FOODS AND NUTRACEUTICALS**

Functional food, Regulatory issues, Sources and role of isoprenoids, Isoflavones, Flavonoids, Carotenoids, Tocotrienols, polyunsaturated fatty acids, sphingolipids, lecithin, choline, Terpenoids, Vegetables, Cereals, milk and dairy products as Functional foods.

1. **FOOD PACKAGING TECHNOLOGY**

Objectives and functions of packaging and packaging materials; Types of packaging materials; edible films, biodegradable plastics. Properties of materials, GTR, WVTR. CAP, MAP, Active packaging, Intelligent packaging, Aseptic packaging systems.

1. **GRAIN PROCESSING AND BAKING TECHNOLOGY**

Importance of cereals, Nutrient composition of cereal grains, Milling Process- dry milling and wet milling of various cereal grains, Equipments involved in milling of grains, Role of various bakery ingredients, Vitamin and mineral fortification, omega-3 enriched breads; gluten free breads, Glycemic Index (GI) and Glycemic Load and their impacts.

1. **DAIRY TECHNOLOGY**

Milk composition and properties, Physico-chemical properties of milk constituents, Quality and quantity tests at reception. Processing of milk- filtration, clarification, homogenization and pasteurization, sterilization, UHT milk. Dairy products- butter, ghee, cheese, ice cream. Defects in milk products, fortified milk and milk products.

1. **WATER AND BEVERAGE TECHNOLOGY**

Heavy metals in water and its Implications. Drinking water and standard, carbonated beverages, Fruit juice processing, Non- alcoholic and alcoholic beverages.

**REFERENCE TEXT BOOKS:**

1. Voet, D., Voet, J. G., & Pratt, C. W. (1999). *Fundamentals of biochemistry* New York: Wiley.
2. Adams, M. R and Moss, M. O. (2008). *Food Microbiology*. Cambridge, UK: RCS publisher
3. Srilakshmi, B. (2003). *Food science*. New Age International.
4. Painy FA. 1992. *A Handbook of Food Packaging*. Blackie Academic.
5. Fellows, P. J. (2009). *Food processing technology: principles and practice*. Elsevier.
6. Sahay, K. M., & Singh, K. K. (1996). *Module operations of agricultural processing*. Vikas Publishing House Pvt. Ltd.
7. Nielsen, S. S. (Ed.). (1998). *Food analysis* (Vol. 86). Gaithersburg, MD: Aspen Publishers.
8. De Sukumar.1980*. Outlines of Dairy Technology*. Oxford Univ. Press. Henderson JL. 1971.
9. Varman Alan, and Sakesland, Technology, Chemistry and Microbiology of food beverages, Springer (sie) Publisher, 2 nd edition, 2009