Syllabus for Entrance Test-2023 (Food Technology)

Though the students are expected to have a thorough knowledge of the subjects studied during graduation, however, following areas of various subjects may be studied in detail for appearing in the entrance test.

Unit I

- Cell and its organelles
- Cell division, Structure & replication of DNA
- Gene mutation and Chromosomal alterations
- Basics of Biotechnology and Genetic Engineering
- Basics of Immunology
- Basics of Enzymology

Unit II

- Metabolism of Carbohydrates, Fats, Proteins, Amino acid and Peptides
- Vitamins and their role in metabolism
- Photosynthesis and Respiration in plants
- Seed dormancy
- Plant hormones
- Membrane transport

Unit III

- Food producing plants and herbs
- Vegetable oils
- General account of Spices
- Medicinal plants
- Beverages

Unit IV

- Respiration in humans
- Physiology of digestion
- Basics of Nervous, Urogenital, Endocrine and Circulatory systems
- Environmental pollution-water and air pollution, its causes and effects

Unit V

- Units and dimensions-different systems of units, dimensional formulae
- Basics of Elasticity & Deformation-Hooks law, elastic constants of an isotropic solid, torsion of a cylinder
- Kinematics of Moving Fluids-Equation of Continuity, Bernoulli's theorem,
- Viscous fluids, streamline and turbulent flow
- Concept of viscosity, Newtonian and Non-Newtonian fluids
- Waves-transverse and longitudinal waves in fluids,
- Ultrasonic waves and their applications

Unit VI

- Heat transfer and Enthalpy Calculations-laws of thermodynamics, concept of Thermal equilibrium, entropy concept
- Dielectric-dielectric constant, microwave heating
- Concept of Electron Spin, effects of magnetic field on human cell, applications of MRI and NMR

Unit VII

- Atomic structure, Chemical bonding
- Laboratory safety measures and Qualitative analysis
- Dipole-Dipole interactions
- Thermodynamics
- Nuclear and radiation chemistry
- Gravimetry and Titrimetry
- Solutions, Roults law & its applications
- Bioinorganic Chemistry-metalloporphyrins and essential elements
- Polymer chemistry

Unit VIII

- Cycloalkanes, Alkenes and Alkynes
- Alcohols and Phenols
- Aldehydes and Ketones
- Carboxylic Acids and their derivatives
- Chemical Kinetics and Catalysis
- Stereochemistry of organic compounds
- Spectroscopy and Photochemistry
- Synthetic dyes

Unit IX

- Basic properties of limits, infinitesimals, definitions with examples, continuity and basic properties of continuous functions on closed intervals
- Review of complex number system, triangle inequality and its generalization Geometric representation of complex numbers. DeMoivre's theorem for rational index and its application
- Parabola: Equation of Tangent and normal, pole and polar, Ellipse, Tangent and
  Normal
- Hyperbola: Equation of tangents and normal
- Review of the methods of integration, integration of algebraic rational function, case of non-repeated linear factors by partial fractions. Integration of algebraic rational functions by substitution, Reduction formulae, Definite integral

Unit X

- Degree and order of different equations, Equations of first order and first degree. Homogeneous equation and non-homogeneous equations.

- Symmetric and Skew-symmetric, Hermition and skew Hermition matrics, Diagonal, scaler triangular matrics, sum of matrices and properties of matrix addition. Product of matrices, Transpose of a product of two matrices and its generalization to several matrices. Adjoint of square matrix A and relation A (adj.A)= (adj.A) A= (A) I, Inverse of a square matrix. Rank of matrix. Elementary row and column transformation of a matrix.
- General properties of equations, synthetic division, Relation between the roots and the Coefficient of an equation, Transformation of equations, Formation of equations whose roots are function of the roots of a given equation.

Unit XI
Fruit, Vegetable and Cereal Processing

- Scope of fruit & vegetable preservation in India
- Principles & methods of preservation
- Canning, Drying/Dehydration, Freezing of fruits & vegetables
- Jam, Jelly, Marmalade, Pickles
- FPO specifications of value-added products
- Structure of different grains-wheat, rice, barley, oat and corn
- Milling of grains
- Flour and its uses
- Milling and parboiling of paddy
- Preparation of baked products-bread, biscuits & cakes

Unit XII
Meat and Dairy Technology

- Scope of meat processing in India
- Structure, composition, nutritive value and postmortem biochemical changes
- in relation to quality of meat tissues
- Principles of meat preservation
- Description, chemical composition & nutritive value of egg
- Physico-chemical properties of milk
- Liquid milk processing-pasteurization & sterilization
- Preparation of milk products

Unit XIII
Bio-chemistry

- Structure and role of water in biological systems
- Acids, bases & buffers of living systems
- Structure of carbohydrates, lipids & amino-acids
- Nature and function of food enzyme
- Naturally occurring pigments in food-chlorophyll, carotenoids, haemoglobin etc.
- Balanced diet

Unit XIV
Microbiology

- Brief discussion on bacteria, yeast and molds

- Role of micro-organism in food, dairy and fermentation industries
- Microorganisms as food-single cell proteins
- Nutrition and growth of microorganisms
- Role of microorganisms in food, dairy and fermentation industries
- Fermentation & its types: Concepts of industrial fermentations-batch & continuous

Unit XV

- Measures of central tendency-mean, median mode
- Measure of dispersion-range, standard deviation & Coefficient of variation
- Tests of significance-t-test, chi square test
- Correlation & regression-concept and applications