FOOD CHEMISTRY

Full Marks: 100

1. Introduction to chemical composition of Food. 3
2. Classification, physical and chemical properties of food carbohydrates, monosaccharide (chemistry of glucose and fructose only), glucose syrup (corn syrup) - general properties, manufacture (both acidic and enzymatic) and its industrial application general review of fructose, mannose and others.

   Disaccharides: General comparative studies of sucrose, maltose, lactose and other related compounds. **24**

   Polysaccharides: Detailed study of starch (Physical, chemical properties, industrial uses), general properties of cellulose, hemicellulose and crude fibers, chemistry of glycogen and gums. 16
3. **Proteins:** Occurrence, physical and chemical properties, peptide bond, amino acid- classification of proteins, their properties and determination of protein. 7
4. Example of Food protein (comparative studies of milk, meat and wheat proteins) 2
5. **Lipids:** Definition, occurrence & composition, fatty acids, fats, & their physical & chemical properties, identification on natural fats & oils, manufacture of edible oil, hydrogenation, Rancidity-different types of rancidity and antioxidants. Brief discussion on salad, cooking and frying oils, shortening and margarine. **16**
6. **Peptic substances:** Occurrence,structure,pectolytic enzymes, use of pectin as a jellifying agent, theories of gel formation , coagulation & cloud stability, use of pectin in food. 6
7. **Minerals in foods:** Their bio-chemical function and composition, method of their determination-Ca, Fe, K,Na etc. 6
8. **Vitamins in foods:** Occurrence, structure and their importance, effect of processing on vitamins. 6
9. **Natural pigments in foods:** Brief chemistry of chlorophylls, carotenoids, and anthocyanins. Effect of processing and cooking. 8
10. Chemistry of natural food colorants such as turmeric, caramel and annatto. 2
11. **Moisture in foods**: types and chemistry, hydrogen bonding, bound water, free water, water activity, methods of moisture determination. 6
12. **Food additives:** Synthetic color, flavor intensifiers monosodium glutamate (MSG) ,Emulsifier, Artificial Sweeteners (saccharin, cyclamates) 8

13. **Browing in food:** Non enzymatic browning-mallard's reaction, ascorbic acid oxidation, caramelization browning mechanism, methods of preventing browning, Enzymatic browning: Mechanism, methods of prevention. 10

Practical

1. Proximate analyses of food- determination of moisture, carbohydrate, crude protein, ash, crude fibre and fat
2. Determination of acidity and pH of food materials.
3. Quantitative test of protein- Formal titration & Kjeldahl method
4. Carbohydrates: Estimation of reducing sugar, estimation of starch by hydrolysis.
5. Oil & fats: Determination of acid value, saponification value, iodine value, peroxide value, R.M value, K value
6. Estimation of ascorbic acid
7. Estimation of minerals: Ca and Fe

TEXT BOOKS

1. Lillian Hozland Mayer. Food Chemistry
2. Owen and Fennema. Principle of food science- Food chemistry
3. Prank A Lee. Basic food chemistry
4. J.L. Jain. Fundamental of Biochemistry
5. Z. Berk. Brareman; Introduction to biochemistry of food
6. G.G. Birch, Sugar-science and technology
7. Glucose syrup
8. BS Bahl. Organic Chemistry