Jaysingpur college , Jaysingpur

B.Sc I (Food science & Quality control)

Semister I

Paper I : Food Chemistry I

Unit 1. Chemistry of carbohydrates (14)

1.1 Introduction

1.2 Structure, classification & physico-chemical properties

1.3 Functions & sources of carbohydrates

1.4 Digestion & absorption of carbohydrates

1.5 Dietery fibre- Soluble & insoluble fibre

Physiological effects of fibres

Role of fibre in human nutrition

Unit 2 Chemistry of Fats (12)

2.1 Introduction

2.2 Structure, classification & properties of fats

2.3 Fats in body – phospolipid, cholesterol, ketonebodies, brown adipose tissue

2.4 Fats in Food – Isoprenoids, visible & invisible fats,characteristics of animal & Vegetable fats

2.5 Digestion & absorption of fat

Unit 3 Chemistry of Protein (13)

3.1 Introduction

3.2 Structure, classification & physico-chemical properties of proteins

3.3 Essential & Non-essential amino acids & their functions in human body

3.4 Digestion & absorption of proteins

3.5 Modification of food proteins during processing & storage

Unit 4 Vitamins & Minerals **(10)**

4.1 Vitamins- definition, classification & different sources of vitamins

4.2 Functions & deficiency disorders of vitamins

4.3 Minerals- definition, classification & different sources of minerals

4.4 Functions & deficiency disorders of minerals

Paper II Food Microbiology

Unit 1 Food microbiology & general characteristics of micro organisms (14)

1.1 Introduction of food microbiology & its relevance

1.2 Importance of food microbiology

1.3 Morphological characters of bacteria, fungi, viruses & protozoa

1.4 Factors affecting the growth of micro-organisms & growth curve

Unit 2 Sources of contamination (7)

2.1 Sources of contamination from air

2.2 Sources of contamination from water

2.3 Sources of contamination from soil

2.4 Sources of contamination from sewage

Unit 3 Spoilage of different food products (15)

3.1 Spoilage of cereal &cereal products

3.2 Spoilage of sugar & confectionary products

3.3 Spoilage of fruits & vegetables

3.4 Spoilage of meat ,fish &poultry products

3.5 Spoilage of milk & milk products

Unit 4 Pure culture Techniques & staining procedures (11)

4.1 Culture media – Living media

Non living media

Common components of media & their functions

4.2 Methods for isolation of pure culture- Streak plate technique

Pour & Spread plate technique

4.3 Classification of stains- acidic, basic & neutral

4.4 Principles , Procedures,mechanisms & applications of staining procedures

Simple staining

Negative staining

Gram staining

Differential staining

Semester II

Paper III Food Chemistry II

Unit 1 Food pigments & Flavonoids (12)

1.1 Introduction of food pigments

1.2 Physical & chemical properties of food pigments

1.3 Use of food pigments in food processing

1.4 Introduction of flavor components

1.5 Structure of different flavonoids & flavor components

Unit 2 Food additives & food adulteration (16)

2.1 Introduction

2.2 Different food additives- antioxidants,antimicrobial agents, non nutritive low Calorie substances & thickners,preservatives etc

2.3Different food adulterants

2.4 Methods for detection of common adulterants in food

Unit 3 Enzymes (13)

3.1 Nomenclature & classification of enzymes

3.2 Factors controlling enzyme reaction

3.3 Role of enzymes in food quality control

3.4 Applications of enzymes in food industry

Unit 4 Chemistry of cooking (9)

4.1 Introduction

4.2 Transfer of heat during cooking – Conduction

Convection

Radiation

4.3 Cooking media – air,water,steam,fat

4.4Microwave cooking – method, advantage & disadvantages

4.5 changes during cooking- change in proteins , carbohydrates,fats,vitamins ,minerals,colour

4.6 Techniques of cooking- Roasting, baking, frying,boiling,steaming,grilling etc

Paper IV Nutritional science

Unit 1 Nutrition **(10)**

1.1 Introduction

1.2 Fundamentals of the nutrition & nutritional properties

1.3 Importance of carbohydrates, proteins, fats, vitamins & minerals

Unit 2 Energy value **(8)**

2.1 Introduction

2.2 Recommended dietary allowance

2.3 Energy value of food

2.4 Daily BMR activities

2.5 Biological value of food

Unit 3 Nutritional aspects & composition of cereal &pulses **(12)**

3.1 Nutritional aspects & composition of fruits & vegetables

3.2 Nutritional aspects & composition of milk & milk products

3.3 Nutritional aspects & composition fish, meat &poultry

3.4 Nutritional aspects & composition sugar & sugar products

Unit 4 Balanced diet & interrelationship between nutrients **(9)**

4.1Balanced diet- introduction, menu planning, planning of balanced meal

Special nutritional requirements,

4.2 Effect of cooking &processing on nutrients

4.3 Inter- relationship between vitamin & nutrients-

Vitamin vitamin Inter relationship

Mineral mineral Inter relationship

Effect of carbohydrate, fat & protein on vitamin requirement

Practical course

List of Practicals

1) Study of compound microscope
2) Study of some common laboratory instruments
3) Study of monochrome staining
4) Study of Gram staining
5) Study of preparation of following culture media
    a) Nutrient broth
    b) Nutrient agar
    c) Mac Conkeys agar
    d) Starch agar
    e) Milk agar
6) Study of determination of quality of milk by methylene blue time Reducyion test
7) Study of phosphtase test
8) Study of amylase activity
9) Study of caseinase activity
10) Study of catalase activity
11) Study of estimation of protein by Biuret test
12) Determination of hardness of water by EDTA method
13) Determination of moisture content of food
14) Determination of iodine value of oil

15) Determination of estimation of iron

16) Study of basic platform tests of milk

17) Study of detection of adulterants in common food

18) Study of different streaking methods

19) Study of Benedicts test for reducing sugars

20) Determination of acid value of fat

Nature of theory Examination and distribution of marks

Paper I, II ,III and IV (50 marks each)

Q. 1 Multiple choice questions	10 Marks
Q. 2 Long answer questions	
Two out of Three (2x10)	20 Marks
Q. 3 Short notes	
Four out of six (4x5)	20 Marks
Total	50 Marks

Practical Examination of 50 Marks -

1. The practical examination will be conducted one day for not less than five hours on the day of practical examination

2. Each candidate must produce a certificate from the Head of the department in his / her college stating that he / she has completed practical course in satisfactory manner on the lines laid down from time to time by A. C on the recommendation of BOS and that laboratory journal has been properly maintain

3. Candidate have to visit at list one place of interest (food industry/ Dairy/ Research lab) and submit the report of their visit at the time of the examination. The report duly certified by Head of the department.

Distribution of marks for practical examination -

Q. 1 Spotting	10 Marks
Q. 2 Physiological experiment	8 Marks
Q. 3 Biochemical experiment	8 Marks
Q. 4 Microbial experiment	8 Marks
Q. 5 Staining method	6 Marks
Q. 6 Journal	5 Marks
Q. 7 Tour report	5 Marks
	50 Marks

Equivalence syllabus of Food Science & Quality Control B. Sc. I

Sr.No	Title of old paper	Title of new paper
1	Semester I Paper I: Food Chemistry I Paper II: Food microbiology	Semester I Paper I: Food Chemistry I Paper II: Food microbiology
2	Semester II Paper III: Food Chemistry II Paper IV: Biochemistry &Nutrition	Semester II Paper III:Food Chemistry II Paper IV: Nutritional Science