CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD

GCE ADVANCED LEVEL SYLLABUS

740 FOOD SCIENCE AND NUTRITION

GCE BOARD
PMB 10,000
BUEA
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740 FOOD SCIENCE AND NUTRITION

1. INTRODUCTION

Candidates should be aware that Food Science and Nutrition should be studied in relation to other science subjects as Biology, Chemistry, Physics, Mathematics, etc.

The subject should meet all aspects of Food Science and Nutrition and their application in Food Technology.

The examination may only be taken at centres which have suitable equipment for practical tests and are approved for the purpose.

2. AIMS

A. Provide informed career choices in Nutrition, Food Technology and the Biological Sciences e.g. Nursing, Medicine.

B. Enable acquisition of knowledge in the principles of food safety measures and food security systems that enhance individual, family, community and national health.

C. Foster inventiveness, originality, creativity and to conduct research and meet the Changing needs of individuals and families. To emphasize practical skills in Food Science and Nutrition.

D. Enable students to adapt to rapid technological changes, the growth of scientific knowledge and the interactions of customs and values in a culturally, socially and economically diverse society.

E. Educate students as intelligent consumers and producers of goods in order to ensure good family living.

3. OBJECTIVES OF THE CURRICULUM

3.1. General objectives

The curriculum should achieve the following objectives:

A. Comprehension of basic knowledge and principles of Food Science and Nutrition.

B. Acquisition of knowledge in Consumer Education.

C. Acquisition of knowledge in the principles of food processing, conservation of nutrients, and planning of balanced meals that suit different occasions

D. Comprehension of kinds of foods that will meet the recommended dietary requirements of the different population age groups: and nutrients that promote health and reduce the incidence of sickness in the population.

E. Appraisal of Food Science and Nutrition as applicable in the food manufacturing industry.

F. Prepare students for initiatives in job creation, occupational and professional employments.

3.2. Assessment objectives:

The examination will test the six levels of Bloom's Taxonomy of learning outcome.

Knowledge (AO1)

i. Identify, recall and express knowledge of nutritional facts, terms, principles, concepts, relationship, experimental techniques etc.

ii. Recognize career choice in Food Science and Nutrition, Food Technology and Biological sciences e.g. Nursing and Medicine.

Comprehension (AO1)

i. Develop an understanding of the dietary goals and health of the community.

ii. Demonstrate knowledge, skills, attitudes and understanding of appropriate practical techniques and safety precautions.

Application (AO2)

i. Constructing hypothesis, designing experiments, making demonstrations, recording accurate observations and interpreting results.

ii. Relationship between nutritional needs and health of the society.

Analysis (AO3)

Demonstrate understanding of knowledge of Food Science and Nutrition and use it to solve problems including those of personal, social, economic and the changing technological nature**.**

Synthesis (AO4)

Select and organize information and skills, relevant to particular ideas and attitudes in Food Science and Nutrition and coherently communicate them.

Evaluation (AO5)

Interpret the socio-economic and technological applications of Food Science and Nutrition in society.

740 Practical Components

The assessment of the practical (experimental and investigative) skills should focus on the 'POAE` skill areas listed in AO5 below:

AO5: Candidates will be required to show their ability to:

- Devise and **p**lan experimental or investigative procedures –**P**,
- **O**btain evidence or result, recording it methodically and presenting it in a suitable form –**O**,
- **A**nalyse this evidence, and use it to draw conclusions-**A**,
- **E**valuate evidence -**E**

3.3. Weighting of Examination and the Assessment Objectives

Paper	Description	Duration	Maximum Marks	Overall Weighting	Number of Questions and Specifications	Weighting of	Level of Difficulty
1	Written paper with MCQ	1 hour	50	35%	50 questions viz.: 5 on knowledge & comprehension, 10 on application, 15 on analysis, 15 on synthesis, and 5 on evaluation	AO1 = 10 %, AO2 = 20 % AO3 = 30 %, AO4 = 30 % AO5 = 10 %	30 one star questions (*) 15 two star questions (**) and 5 triple star questions (***)
2	Written paper **Essay:** **Section A:** Application of Nutritional Science	30 minutes	25	10%	**Section A:** 2 questions with sub-units for candidates to choose one, on application of nutritional science.	AO1 = 25 % AO2 = 30 % AO3 = 30 % AO4 = 20 % AO5 = 10 %	About 60 % (*), 30% (**) and 10 % (***)
	Section B: Food Consumption And Health	1hour	25	10%	**Section B:** 2 questions with sub-units for candidates to choose one, on food consumption and health	AO1 = 10 %, AO2 = 30 % AO3 = 20 %, AO4 = 20 % AO5 = 20 %	
	Section C: Food Science	1 hour	25	10%	**Section C:** 2 questions with sub-units for candidates to choose one, on food science.	AO1 = 20 %, AO2 = 30 % AO3 = 20 %, AO4 = 20 % AO5 = 10 %	
	Section D: Community Health and Nutrition	30 minutes	25	10%	Section D: 2 Questions with sub-units for candidates to choose one, on community health and nutrition.	AO1 = 35 %, AO2 = 20 % AO3 = 20 %, AO4 = 15 % AO5 = 10 %	

Paper	Description	Duration	Maximum Marks	Overall Weighting	Number of Questions and Specifications	Weighting of	Level of Difficulty
3	**Practical Component:** **Part1** Food Science	1 hour	50	10 %	2 questions will be set for duration 1 hour. Candidates are advised to spend 30 minutes on each question. Candidates will be provided with instructions on how to carry out the practical test. (3 sets of questions will be provided for 3 groups of candidates).	**AO6:** P = 30 % • O = 30 % • A = 20 % • E = 20 % (see page 2 for a detail description of these four skill areas: P, O, A, E)	About 60 % (*), 30% (**) and 10 % (***)
	Part 2 Cookery	2 hours	50	10 %	2 questions will be set; for duration of 2 hours i.e.1 hour for each question. (3 sets of questions will be provided for 3 groups of candidates).		
	Part 3 SBA* Practical Note book	SBA*	50	5 %	A local examiner appointed by the Cameroon GCE Board will assess candidates' practical note books and the final marks appraised and/or moderated during the marking of the other written component of the paper.		

*School Base Assessment

4. THE EXAMINATION STRUCTURE

Advanced Level Food Science and Nutrition Examination shall be comprised of 3 papers:

Paper 1: (I hour 30 minutes.)

Paper 1 will consist of 50 Multiple Choice Questions (MCQ)drawn from the whole syllabus for a total of 50marks. This shall be weighted 35% of the total subject marks.

Paper 2: (3 hours)

Paper 2 will be made up of 8 essay-type questions, 2 for each of the 4 sections A, B, C,and D. Candidates shall be required to choose one question from each section giving a total of 4 questions to be answered by each candidate. The total marks for this paper shall be 100for duration of 3 hours. This shall constitute 40% of the total subject marks.

Paper 3:

Paper 3 shall be a school based practical component and shall be broken down as follows:

Part 1- Food Science (1 hour**)**

This shall carry 50marks and be weighted 10% of the total subject marks.

Part 2- Cookery (2 hours)

Cookery shall be 2hoursand shall be accompanied by some basic food science questions:

Two (2) Questions will be set; each will be done in 1 hour and candidates will go through in 2 hours. (3 sets of questions will be provided for 3 groups of candidates). It shall carry a total of 50 marks and will constitute 10% of the total subject marks.

NOTE: Cookery practical (part2) will take place one hour after Food Science practical.

Part 3

School Base Assessment (SBA):

A local examiner appointed by the Cameroon GCE Board will assess candidates' SBA practical note books. The note book shall contain a record of the candidate's practical work throughout the school year. It shall carry 50 marks and will constitute 5% of the total subject marks.

External candidates will be required to identify a school which will evaluate and grade their SBA Practical Note Book.

Summary of Examination Structure

Paper Nº	Question Type	No of Questions	Sections	Nº to be answered	Duration	Total Marks	Weighting
1	MCQ	50	overall	50	1 ½ hours	50	35 %
2	Essay	8	A, B, C and D	4	3 hours	100	40 %
3	Practical Component	2	Part 1 Food Science	2	1 hour	50	10 %
		2	Part 2 Cookery	2	2 hours	50	10 %
	SBA	Open	Part 3 SBA	Open	Within the school year	50	5 %

SYLLABUS CONTENT

5. Unit A: APPLICATION OF NUTRITIONAL SCIENCE

5.1**Definition the basic terms used in Food Scienceand Nutrition**

Glazing,kneading, Scalding, Frosting, dish, accompaniment, braising, roux, bouquet – garni, grilling, suet, simmering, metabolism, pro-vitamins, anti-nutrients, poaching, enzymes, allergy, lip, fermentation etc.

5.2**Review the concept of food groups and functions.**

5.2.1 Definition of food.

5.2.2 Classification of food groups, nutrients, chemical structure of macro nutrients.

5.5.3 Functions of nutrients (protein, carbohydrates, fats and oil, vitamins, minerals, water and dietary fibre).

5.3**Test on nutrients.**

5.3.1Protein:e.g. Foam test, Million's test and Biuret test.

5.3.2 Carbohydrates: e.g. (Starch), Iodine test, Litmus test

5.3.3Fats and Oils: e.g. Blotting paper test, Sudan III test, Ethanol tests.

5.4 **Food composition table.**

5.4.1 Definition of food composition table.

5.4.2 Structure of the food composition table.

5.4.3Uses of food composition table.

5.4.4 Limitations of the food Composition Table.

6. Unit B: FOOD CONSUMPTION AND HEALTH

6.1**Structure and Functions of the digestive tract and absorption of nutrients.**

6.1.1 Definition of Digestion.

6.1.2 Definition of Absorption.

6.1.3 Structure of the Digestive System

6.1.4 Digestive Process

6.1.5 Absorption and Assimilation of Nutrients

6.2**Food Security**

6.2.1 Definition of food security

6.2.2 Importance of food security in improving the Nutritional status of the population.

6.2.3 Levels and problems of food security (Household food security, community, National and International food security).

6.2.4Government policies to ensure adequate food security e.g.

i. Growth in food and Agriculture sector.
ii. Improving assess to land and other natural resources e.g. financial resources and Gender balance.
iii. Stabilization of food supplies by Government.e.g.
    a. Stock holding.
    b. Increase importation.
    c. Increase production.
iv. Empowerment of the household.
    a. Promoting self-employment.
    b. Increasing employment opportunities.
    c. Promoting the consumption of micronutrient food.
    d. Enhancing coping mechanism of household e.g. (Agric – Educationpolicy, Extension work, supply of seeds, farm tools, and chemicals used to improve farm crops- Factors influencing Food Security.
v. Rational use of food supplies.

6.3 Consumer Education

6.3.1 Definition of terms

6.3.2 Consumer Education.

6.3.3 Consumer:

i. Adulteration.
ii. Misbranding.
iii. Food Standards.
iv. Hire purchase.
v. Credit purchase.

vi. Impulse buying:

a. Importance of consumer education.

b. Principles of consumer education.

c. Consumer agents.

d. Ways by which government can protect the health of consumers through improved food quality.

e. Labeling and advertising of food:

1. General labeling requirements.
2. Name.
3. Ingredients.
4. Durability.
5. Instructions to use.
6. Manner of marking or labeling.

6.4 **Food Quality Control.**

6.4.1Definitions.

6.4.2 Food Laws, regulations and standards.

6.4.3Sensory Evaluation.

6.5**Entrepreneurship.**

6.5.1Definition of enterprise and entrepreneur.

6.5.2 Developing a business plan.

6.5.3 Industrial Relations.

6.6**Food, Health and Disease**

6.6.1Food, related disease

i. Diabetes, Peptic – Ulcer, Anaemias, Obesity, Goiter, Gout.

ii. Cardio-vascular disorder e.g. Hypertension, Conjective heart failure etc.

iii. Digestive disorders.

6.6.2Vulnerable groups of the above diseases e.g.

i. Anemia e.g. Pregnant women, lactating mothers, adolescent girls and children

ii. Cardio-vascular disorders e.g. Hypertension; diabetic, e.g.(obese people etc.).

iii. Definition.

iv. Signs and symptoms.

v. Causes.

6.6.3 Nutritional needs and meal planning of the following groups;

Dietary management of the following health disorders: (Obesity, Diabetes, cardio-vascular disorder, Anaemias, goiter, peptic ulcer).

i. Definitions
ii. Signs and Symptoms
iii. Causes
iv. Nutritional needs
v. Meal planning for each group above.

6.6.4Food Allergy:

i. Definition
ii. Causes of food allergy
iii. Symptoms of food allergy
iv. Examples of food that can cause food allergy e.g. (cow milk, eggs, fish, shell fish such as crayfish, wheat, some cereals and some fruits.)
v. Prevention and Treatment.

7.Unit C: FOOD SCIENCE

7.1**Enzymes and life**

7.1.1 Definition of enzymes
7.1.2 The chemical nature of enzymes
7.1.3 Classification of enzymes
7.1.4 Enzymes as catalysts
7.1.5 Selectivity of enzymes (the lock-and-key theory of enzymes)
7.1.6 Sensitivity of enzymes
7.1.7 Uses of enzymes in food industry.

7.2**Beverages**

7.2.1 Definition of beverages
7.2.2 Types of beverages e.g.

i. Alcoholic beverages (e.g. Beer, wine, spirit, stout, etc.)
ii. Non-alcoholic e.g. (Fruit juice, milk, lemon grass, fizzy drinks, tea, coffee, cocoa, etc.)

7.2.3 Nutritive value of beverages (nourishing, refreshing and stimulating beverages).
7.2.4 Definition of fermentation.
7.2.5 Fermentation process of alcoholic beverages.
7.2.6 Learning Experience (experiment on the fermentation process using maize).

7.3**Elementary studies on emulsion and emulsifying agents.**

7.3.1Definitions (Emulsion, emulsifying agents and immiscible liquid).

7.3.2 The concept of oil-in-water (O/W) emulsions

7.3.3The concept of water-in-oil (W/O) emulsion

7.3.4Examples of food emulsions (milk, cream, butter, mayonnaise, salad cream, margarine, ice Cream, etc.).

7.3.5Uses of emulsifying agents.

7.3.6Manufactured food to which emulsifiers are added (several products containing fats, e.g. margarine, cooking fats, salad dressings and ice cream), local to which emulsifiers are added e.g. yellow soup

7.3.7Mayonnaise and salad cream.

7.3.8Ice cream.

7.4**Elementary studies in the making of margarine.**

7.4.1Steps in the making of margarine.

7.4.2Comparison of margarine and butter.

7.5**Elementary studies on oils and fats.**

7.5.1 An overview of concepts

7.5.2Fatty acid derivatives – e.g. waxes and phospholipids (important examples of fatty acids Derivatives).

7.5.3Cholesterol.

7.5.4Lecithin.

7.5.5Esters.

7.5.6Glycerol.

7.5.7Triglyceride.

7.5.8Steps in making local oils e.g., palm oil, coconut oil, groundnuts oil,etc.

7.6**Studies on Carbohydrates**

7.6.1 Cereals and tubers.

i. Definition.

ii. Types of cereals and tubers.

7.7**Studies on wheat and maize**

7.7.1Wheat

i. Structure of wheat grain.

ii. Types of wheat/ Types of wheat flour.

iii. Processing of wheat flour.

iv. Products made from wheat flour.

a. Semolina
b. Definition
c. Examples of the product e.g. (flour) Pasta
d. Pasta
    1. Definition.
    2. Examples of Pasta.

v. Advantages and disadvantages of wheat flour
vi. Nutritive value of wheat and maize flour

7.7.2 Maize

i. Structure
ii. Processing of maize
iii. Products made from maize (e.g. cornstarch, cornflakes, corn syrup, glucose)

7.6.3 Effects of milling on Cereals.

7.6.4 Other types of flour used as food in our locality: e.g. rice flour, corn flour, soyabean flour, yam flour, cassava flour (Assignment on production of flour from our local food).

7.6.5 Bread Making.

7.7 Food Contaminants

7.7.1Definition of food contaminants

7.7.2 Contaminant with agricultural chemicals (treatment of crops with insecticides, fungicides, herbicides i.e. weed killers or growth regulators to kill weeds selectively).

7.7.3 Antibiotics: Treatment of soil, crops and animals with chemicals, resistance of organisms to antibiotics, use of antibiotics by farmers.

7.7.4Lead: (contamination of vegetable and fruits).

7.7.5 Radioactive contaminants (i.e. materials which enter the atmosphere as a result of nuclear explosion.

7.7.6 Food Additives/Food Legislation.

i. Definition of food additives.
ii. Classes of food additives (emulsifiers and stabilizers, colouring matter, flavor modifiers, anti-oxidants.
    a. Sweetening agents.
    b. Solvents.
    c. Mineral oils.
    d. Nutritive additives e.g.
        1. Vitamin A must be added to margarine by law.

2. Iodized salt.

iii. General principles of food legislation.

7.8The action of acids as preservatives in the food industry.

7.8.1 A review of the pH as applicable to food preservation.

7.8.2 Acids that are present naturally in foods as preservatives (acetiacid, vinegar, ascorbic acid, citric acid, malic acid, tartaric acid, and phosphoric acid).

7.8.3 Permitted non-natural acids as preservatives (Sulphur dioxide, Benzoic acid, P-hydroxy Benzoic acid, propionic acid, ascorbic acid).

8. Unit D: COMMUNITY HEALTH AND NUTRITION

8.1 Structure of a community.

8.1.1 Definition of a community.

8.1.2 Population groups of a community (e.g. children, pregnant women, aged (old people)).

8.2Food production pattern of a community.

8.2.1Types of food cultivated in a community.

8.2.2 Factors that influence food production (man-power income, farm input, laziness)

8.2.3 Use of organic food.

8.2.4 Advantages and disadvantages.

8.3 Cultural Food habits.

8.3.1 Definition of food habits.

8.3.2 Factors influencing food habits.

8.3.4 Health consequences of food taboos, fads and fallacies.

8.3.5 Examples of food fads,Taboos and fallacies in Cameroon.

8.4 Protein – Energy Malnutrition (P.E.M)

8.4.1 Treat Kwashiorkor.

8.4.2 Treat Marasmus.

8.5.Measures to promote appropriate diet and healthy life styles in a population.

8.6 Measures to prevent specific micro nutrients deficiency in a population.

8.7 Water use and Sanitation in the community.

8.7.1 Definition.

8.7.2 Physical characteristics of water.

8.7.3 Water supplies.

8.7.4 Water as a solvent.

8.7.5 Water supplies and health.

8.7.6 Importance of water to health and the home.

9.PRACTICAL COMPONENT

9.1Food Science

9.1.1 Test for carbohydrate, fats and proteins.

9.1.2 Fermentation of cereals (maize).

9.1.3 Fermentation of Tubers (Cassava and sweet potatoes).

9.1.4 Milling process of cereals (wheat and maize).

9.1.5 Pre-processing of tubers to produce flour e.g. (cassava and sweet potatoes).

9.1.6 Pre-processing of legumes e.g.(soya bean flour and soya bean products).

9.1.7 Use of the Food Composition Table.

9.1.8 Preparation of milk products (yoghurt and ice cream).

Recommendation: Students should visit food industries to gain practical knowledge.

9.2 Cookery

9.2.1 Preparation of Traditional dishes from different provinces in Cameroon.

9.2.2 Preparation of traditional snacks e.g. (corn and groundnuts, groundnut paste and garden eggs, dakwa etc.).

9.2.3 Preparation of steamed puddings, baked puddings and cold sweets.

9.2.4 Production of flour products e.g. Puff-Puff, various types of bread, tarts and biscuits.

9.2.5 Preparation of foreign dishes (savouries, Hors d'oeuvres etc.).

9.2.6 Preparation of food for people with special health problems.

9.2.7 Preparation of non-alcoholic beverages.

9.2.8 Jam making.

9.2.9 Baking and icing of cakes.

10.Modalities for Food Science Practicals.

The Cameroon GCE Board will make available in practical centres the food items to be used for the Food Science practicals. This shall involve the use of the following locally available food stuffs:

1. Cereals (maize, rice,).
2. Legumes (soya beans, groundnut, cow peas).
3. Tubers (potatoes, yam, cassava, cocoyam).
4. Protein foods (eggs, dried fish).
5. Vegetables (tomato, onion, okra, cabbage)
6. Fruits (Pineapple, orange, paw-paw, etc.)

The above items shall ONLY be required in small quantities. (E.g. 2 cups of rice,5tubers Potatoes, 5eggs etc.)

Note: ***Centres involved with the practicals must possess a well-equipped cookery laboratory, inspected and approved by the Board.***

Cross curricula demands

Mathematics – knowledge and understanding of the following basic concepts is required:

- Calculations involving simple proportions, weight,
- Recommended dietary needs, use of money,
- Purchasing portions, etc.

Sciences:

- **Chemistry**: chemical position of food and nutrients.
  - Scientific methods of food production and food preparation, c
  - Chemical changes in foods under certain conditions, e.g. Apple, yellow yams go brown etc.
- **Physical** – heat exchange – metals etc.
- **Human Biology** – Digestion of food
- **Biology** – Food – plants – animal sources
- **Health Education** – Food related diseases, food and man, special needs.
- **Language-** Communicate information, (all four aspects) –
  - reading, writing, listening,

History and **Geography**

- Food history and man; migration.
  - English and French Food production and their availability in specific geographic regions**.**
  - Entertaining – catering, hotel etc.
  - Food Industry – Chococam, Brasseries etc.

Economics - Buying and retailing; socio-economic factors and nutrition etc.

6. Unit A: APPLICATION OF NUTRITIONAL SCIENCE

5.1 **Definition the basic terms used in Food Science and Nutrition**

Glazing, kneading, Scalding, Frosting, dish, accompaniment, braising, roux, bouquet – garni, grilling, suet, simmering, metabolism, pro-vitamins, anti-nutrients, poaching, enzymes, allergy, lip, fermentation etc.

5.2 **Review the concept of food groups and functions.**

5.2.1 Definition of food.

5.2.2 Classification of food groups, nutrients, chemical structure of macro nutrients.

5.5.3 Functions of nutrients (protein, carbohydrates, fats and oil, vitamins, minerals, water and dietary fibre).

5.3 **Test on nutrients.**

5.3.1 Protein: e.g. Foam test, Million's test and Biuret test.

5.3.2 Carbohydrates: e.g. (Starch), Iodine test, Litmus test

5.3.3 Fats and Oils: e.g. Blotting paper test, Sudan III test, Ethanol tests.

5.4 **Food composition table.**

5.4.1 Definition of food composition table.

5.4.2 Structure of the food composition table.

5.4.3 Uses of food composition table.

5.4.4 Limitations of the food Composition Table.

SYLLABUS GUIDELINES-

This section contains a breakdown of the syllabus topics into teachable units i.e. into schemes of work

TOPIC	SUBTOPICS and NOTES	OBJECTIVES Candidates shall be assessed on their ability to:
SECTION A1. APPLICATION OF NUTRITIONAL SCIENCE:		
1.1 Definition of basic terms used in Food Science and Nutrition	-Definition of the Terms: Glazing, Kneading, Frosting, Dish, Accompaniment, Braising, Roux, Bouquet-garni, Grilling, Suet, Simmering, Metabolism, Pro-vitamins, Anti-nutrients, Poaching etc.	-Define and give clear explanations of basic terms used in Food Science and Nutrition
1.2 Review the	i. Definition of food.	a. State the definition of food.

TOPIC	SUBTOPICS and NOTES	OBJECTIVES Candidates shall be assessed on their ability to:
concept of food groups and functions	ii. Classification of food groups and Nutrients. iii. Functions of nutrients (protein, iv. Carbohydrates, fats and oil, vitamins, minerals, water and dietary fibre).	b. Identify food groups. c. Classify food groups and nutrients. d. State and explain the functions of nutrients. e. Identify and describe food sources and diseases resulting from deficiency of the food nutrients.
1.3 The basic science of nutrients-Practical Test on nutrients	i. Protein: e.g. Foam test, Million's test, and Biuret test. ii. Carbohydrates: e.g. (Starch), Iodine test, Litmus test. iii. Fats and Oils: e.g. Blotting paper test, iv. Sudan III test, Ethanol test.	a. Examine protein by using different reagents and food samples. b. Describe and state result of solutions. c. Examine carbohydrates by illustrating on the various test and reagents involved. d. Illustrate and state results of solutions. e. Examine fats and oils by demonstrating on the various test involved. f. Demonstrate and state results of solutions.
1.4 Introducing the food composition table	i. Definition of food composition table. ii. Structure of the food composition table. iii. Uses of food composition table. iv. Limitations of the food composition table.	a. Define food composition table b. Identify food composition table c. Draw the structure of the food composition table d. Identify food stuffs found on the food composition table. e. Calculate nutrient intake of an individual using the food composition table. f. Enumerate the importance of the food composition table g. State instances where food composition table can be used. h. Mention the limitations of the food composition table
SECTION B:	**2. FOOD CONSUMPTION AND HEALTH**	
2.1 Structure and functions of the digestive tract and absorption of nutrients	i. Definition of Digestion ii. Definition of Absorption iii. Structure of the Digestive System iv. Digestive Process	a. Define digestion b. Define absorption c. Draw and label the structure of digestive system d. Explain the digestive process with illustrations in various parts of digestive system • The mouth • The Esophagus (or oesophagus)

TOPIC	SUBTOPICS and NOTES	OBJECTIVES Candidates shall be assessed on their ability to:
		• The Stomach • The Small Intestine • The Large Intestine
	v. Absorption of Nutrients	f. Explain the absorption of nutrients
2.2 Food Security	i. Definition of food security	a. Define food security
	ii. Importance of food security in improving the nutritional status of the population	b. State and Explain the importance of food security in improving the nutritional status of the population.
	iii. Levels and problems of food security (Household food security, Community, National and International)	c. Identify and Explain problems of food security to the: 1. Household 2. Community 3. National/International
	Iv. Government policies to ensure adequate food security	a. Explain Growth in food and Agriculture Sector b. Enumerate ways of improving access to land and other resources (e.g. financial resources, gender balanced etc.). c. Describe the Stabilization of food supplies by the government (e.g. Stock holding, Increase importation, Increase production etc.). d. Explain Empowerment of the household e.g. 1. Promoting self employment 2. Increasing employment opportunities 3. Promoting the consumption of micronutrients in food 4. Enhancing coping mechanism of household e.g. (Agric – Education policy, Extension work, supply of seeds, farm tools, and chemicals used to improve farm crops. e. Explain Factors influencing Food Security. f. State and Explain Rational use of food supplies.
2.3 Consumer Education	i. Definition of Terms: -Consumer Education -Consumer -Adulteration -Misbranded -Food Standards -Hire purchase	a. Define the various terms used in Consumer Education.

TOPIC	SUBTOPICS and NOTES	OBJECTIVES Candidates shall be assessed on their ability to:
	-Credit purchase -Impulse buying etc.	
	ii. Importance of Consumer Education	b. State the importance of Consumer Education
	iii. Principles of consumer Education	c. Enumerate the Principles of Consumer Education
	iv. Consumer Agents	d. Define, e. List and Explain different types of Consumer Agents and their functions.
	v. d. Ways by which government can protect the health of consumers through improved food quality.	f. Name and Explain ways by which government can protect the health of consumers through improved food quality.
	vi. Labeling and advertising of food: - General labeling requirements - Name - Ingredients - Durability - Instructions to use - Manner of marking or labeling	g. Define Labeling, Advertisement etc. h. State and Explain: 1. General labeling requirements 2. Name 3. Ingredients 4. Durability 5. Instructions to use 6. Manner of marking or labeling
2.4 Food Quality Control	i. Definition of food quality control	Define food quality control
	ii. Food Laws, Regulations and Standards	a. Explain food laws, regulations and standards in relation to food quality control
	iii. Sensory Evaluation	b. Carry out sensory evaluation on foods to determine the quality
2.5 Entrepreneurship	i. Definition of Entrepreneurship	a. Define :enterprise/ entrepreneur /entrepreneurship
	ii. Developing a business plan	b. Analyze and develop a business plan for execution.
	iii. Industrial Relation (small business centre, enterprise, industries etc.)	c. Explain industrial relations in an enterprise/industry.
2.6 Food, Health and Disease	i. Food related diseases: - Diabetes - Peptic Ulcer - Anemia - Obesity - Goitre - Gout , - Cardio-vascular disorders (e.g. Hypertension, Conjective heart failure etc.)	a. Describe the various food related diseases b. Explain the various types involved c. State their causes d. Enumerate the signs and symptoms of each e. Analyze the Preventive measures and treatments of the various food related diseases
	ii. Vulnerable groups of the above	a. Name and explain vulnerable groups

TOPIC	SUBTOPICS and NOTES	OBJECTIVES Candidates shall be assessed on their ability to:
	iii. diseases	of Anaemia e.g. pregnant women, lactating mothers, adolescent girls and children. b. List andexplain vulnerable groups of Cardio-vascular diseases e.g. Hypertension, diabetic, e.g. (Obese people etc.).
	iv. Study guidelines to diet therapy: v. Dietary management of the following health disorder: vi. (Obesity, Diabetes, Cardio-vascular disorder, Anaemia, Goitre, Peptic ulcer)	c. Define the various health disorders d. Cite the Signs and symptoms of each e. State the Causes of each health disorder f. Outline the Nutritional needs of each g. Plan meals for each of the group of health disorders.
	vii. Food Allergy: viii. Definition of Food Allergy: - Causes of food allergy - Symptoms of food allergy - Examples of food that can cause food allergy e.g. (cow's milk, eggs, fish, shell fish e.g. (Cray fish), wheat, some cereals and some fruits). - Prevention and Treatment	a. Define food allergy b. State the causes of food allergy c. List and describe out symptoms of food allergy d. Cite examples of food that can cause food allergy e. Describe the different methods of Prevention and Treatment of food allergy.
SECTION C : 3. FOOD SCIENCE :		
3.1 Enzymes and Life	i. Definition of enzymes ii. The chemical nature of enzymes iii. Classification of enzymes iv. Enzymes as catalysts v. Selectivity of enzymes (the lock-and-key theory of enzymes hypothesis) vi. Sensitivity of enzymes	a. Define enzymes b. Draw and explain the chemical nature of enzymes c. Classify enzymes d. Explain the concept of enzymes as catalysts with the aid of diagram e. Explain the selectivity of enzymes with the aid of diagram f. Explain the sensitivity of enzymes

TOPIC	SUBTOPICS and NOTES	OBJECTIVES Candidates shall be assessed on their ability to:
3.2 Beverages	i. Definition of beverages ii. Types of beverages: - Alcohol beverages (e.g. Beer, wine, spirit, stout etc.) - Non-alcoholic beverages (e.g. Fruit juice, milk, lemon grass drink, tea, coffee, cocoa drink, etc.) iii. Nutritive value of beverages (nourishing, refreshing, and stimulating beverages). iv. Fermentation process of alcoholic beverages v. e. The three stages involved in the fermentation process vi. f. Learning Experience (experience on the fermentation process using maize)	a. Define beverages b. Explain the types of beverages and cite their examples c. Classify beverages according to their nutritive value d. Define fermentation e. Describe the fermentation process of alcoholic beverages f. State and explain the three stages of fermentation process. g. Carry out practical class on the demonstration of fermentation process using maize
3.3 Elementary studies on emulsion and emulsifying agents	i. Definitions of: Emulsion, emulsifying agents and immiscible etc... ii. The concept of oil-in-water (o/w) emulsion. iii. The concept of water-in-oil (w/o) emulsion. iv. Examples of food emulsions (milk, cream, butter, mayonnaise, salad cream, margarine, ice cream etc.). v. Uses of emulsifying agent vi. Manufactured food to which emulsifiers are added (several products containing fats, e.g. margarine, cooking fats, salad dressing and ice cream). vii. Mayonnaise and salad cream	a. Define terms used in Emulsion b. Explain the concept of oil-in-water (o/w) emulsion. c. Carry out experiment on (o/w) emulsion d. Explain the concept of water-in-oil (w/o) emulsion. e. Carry out experiment on (w/o) emulsion f. Cite examples of food emulsions g. State the uses of emulsifying agents h. Identify manufactured food to which emulsifiers are added i. Define mayonnaise and salad cream j. List out recipes for mayonnaise and salad cream k. Prepare mayonnaise and salad cream l. Define ice cream m. Mention recipes for ice cream

TOPIC	SUBTOPICS and NOTES	OBJECTIVES Candidates shall be assessed on their ability to:
	viii. Ice cream	n. Prepare ice cream
3.4 Elementary studies in the making of margarine	i. Definition of margarine ii. Steps in the making of margarine iii. Comparison of margarine and butter	a. Define margarine b. Explain the steps in making margarine c. Differentiate between margarine and butter
3.5 Elementary studies on oils and fats	i. An over view of concepts ii. Fatty acids derivatives – e.g. waxes, and phospholipids, (important examples of fatty acids derivatives). iii. Cholesterol iv. Lecithin v. Esters vi. Glycerol vii. Triglyceride	a. Define concepts used in elementary studies on oils and fats b. Explain fatty acids derivatives and examples c. Explain Cholesterol (sources and effects) d. Explain Lecithin e. State the functions of lecithin f. Explain the composition of Esters g. State functions of Esters h. Define Glycerol i. State the functions of Glycerol j. Define Triglycerides k. Explain its functions
3.6 Studies on Carbohydrates	i. Cereals: -Definition -Types of cereals	a. Define cereals b. Describe the various types of cereals (draw their structures)
	ii. Studies on wheat ; -Definition of wheat -Structure of wheat grain -Types of wheat/Types of wheat flour -Processing of wheat flour -Products made from wheat flour e.g.*Semolina*: -Definition -Examples of the products e.g. (flour)	a. Define wheat b. Draw and label the structure of wheat c. Differentiate the types of wheat and wheat flour d. Explain the processes of making wheat flour e. Enumerate products made from wheat flour f. Define Semolina g. Outline its composition and cite examples of products made from it h. Define pasta

TOPIC	SUBTOPICS and NOTES	OBJECTIVES Candidates shall be assessed on their ability to:
	Pasta: -Definition -Example of Pasta -Advantages and disadvantages of wheat flour -Nutritive value of wheat flour	i. State its composition and enumerate products made from pasta j. Explain the advantages and disadvantages of wheat flour k. Mention the nutritive value of wheat flour
	iii. Studies on maize: -Structure of maize -Processing of maize -Products made from maize (e.g. cornstarch, cornflakes, corn syrup, Glucose). -Nutritive value of maize flour.	a. Outline the variety of maize b. Draw and label the structure of maize c. Explain the Processes involved in processing maize. d. Prepare some products made from maize e. State the nutritive value of maize flour
	iv. Effects of milling on Cereals	-Explain the effects of milling on maize
	v. Other types of flour used as food in our locality; e.g. rice flour, corn flour, soya bean flour, yam flour, cassava flour (Assignment on production of flour from our local food).	a. list other types of flour used as food in our locality b. state their sources and c. Outline the processing of them.
	vii. Bread- making; - Recipes for bread-making - Fermentation action of yeast in bread-making - Steps/ Processes of bread-making - Reasons for faults in bread-making	a. List out recipes for bread-making b. Explain the fermentation action of yeast in bread-making c. Explain steps/ processes involved in bread-making d. Explain reasons for faults in bread-making
3.7.1 Food Contaminants	i. Definition of Contaminants ii. Contaminants with agricultural chemicals (treatment of crops with insecticides, fungicides, herbicides i.e. weed killers or growth regulators to kill weeds selectively). iii. Antibiotics: Treatment of soil, crops and animals with chemicals, resistance of organisms to antibiotics, use of antibiotics by farmers. iv. Lead: (contamination of	a. Define contaminants b. Explain types of contaminants c. Explain contaminants with agricultural chemicals d. Define Antibiotics e. Explain the use of antibiotics in the treatment of soil, crops, and animals f. Explain the effects on the use of antibiotics by farmers a. Define Lead

TOPIC	SUBTOPICS and NOTES	OBJECTIVES Candidates shall be assessed on their ability to:
	vegetables and fruits). v. Radioactive contaminants: (i.e. materials which enter the atmosphere as a result of nuclear explosion).	b. Explain the contamination of vegetables and fruit by lead c. Define radioactive contaminants d. Explain its effects on food and atmosphere
3.7.2 Food Additives/Food Legislation	i. Food Additives 1. Classes of food additives (emulsifiers and stabilizers, colouring matter, flavor modifiers, anti-oxidants). 2. Sweetening agents: a. -Examples of sweetening agents b. -Products in which sweetening agents are used 3. Solvents: a. -Examples of solvents b. -Function of solvents 4. Mineral oils 5. Nutritive value of additives e.g. -Vitamin A must be added to margarine by law 6. Iodized salt ii. Food Legislation - General principles of food legislation.	a. Define food additives b. Classify and explain the types of food additives c. Define sweetening agents d. Cite examples of sweetening agents e. State products in which sweetening agents are used f. Define solvents g. Outline examples of solvents h. State the functions of solvents i. Define mineral oils j. Cite examples of mineral oils k. Explain their roles in food l. Enumerate the nutritive value of food additives m. Explain the function of Vitamin A added to margarine by law n. Explain the function of iodized salt added to margarine o. State and explain general principles of food legislation
3.8 The action of acids as preservatives in the food industry	a. A review of the pH, as applicable to food preservative b. Acids which are present naturally in foods as preservatives (acetic acid, vinegar, ascorbic acid, citric acid, malic acid, tartaric acid, and phosphoric acid).	a. Define pH b. Draw sample of pH paper c. Explain its functions d. Examine the pH level of various food samples e. Explain the various acids which are present naturally in foods as preservatives

TOPIC	SUBTOPICS and NOTES	OBJECTIVES Candidates shall be assessed on their ability to:
	c. Permitted non-natural acids as preservatives (Sulphur dioxide, Benzoic acid, P-Hydroxy Benzoic acid, propionic acid, ascorbic acid).	d. Explain the various non-natural acids as preservatives in food
SECTION D : 4. COMMUNITY HEALTH AND NUTRITION		
4.1 Structure of a community	i. Definition of a community ii. Population groups of a community (e.g. children, pregnant women, aged (old people).	a. Define a community b. State and explain the population groups of a community and their functions in development
4.2 Food production pattern of a community	i. Types of food cultivated in a community ii. Factors that influence food production in a community	a. List types of foods cultivated in a community. and b. Explain how food production enhances the economic status of a community c. Explain factors that influence food production in a community (man-power, income, farm input, laziness, etc.).
4.3 Cultural Food habits	i. Definition of food habits ii. Factors influencing food habits iii. Health consequences of food taboos, fads and fallacies iv. Examples of food fads, taboos and fallacies in Cameroon	a. State and explain various food habits b. Explain factors influencing food habits c. Explain the health consequences of food taboos, fads and fallacies d. Cite examples of food fads, taboos and fallacies in Cameroon
4.4 Protein-Energy Malnutrition	i. Definition ii. Examples - Kwashiorkor - Marasmus	a. Explain the effects of Protein- Energy Malnutrition b. Define Kwashiorkor/Marasmus c. State causes, signs and symptoms, and treatment of both d. Differentiate between Kwashiorkor and Marasmus
4.5 Measures to promote appropriate diet and healthy life styles in a population	Plan and Prepare variety of diets which will enhance healthy life styles in a population	Plan and prepare variety of diets for different individuals in a population/community
4.6 Water use and Sanitation in the community	i. Definition ii. Physical characteristics of water iii. Water supplies	a. Explain the importance of water in a community b. Explain the physical characteristics of water c. Enumerate and explain the various

TOPIC	SUBTOPICS and NOTES	OBJECTIVES Candidates shall be assessed on their ability to:
		water supplies in a community
	iv. Water as a solvent	d. Analyze the concept 'water as a solvent'
	v. Water supplies and health	e. Explain water supplies in relation to health/ purification of water

PRACTIAL COMPONENT

PART 1	**FOOD SCIENCE PRACTICAL**	
	1. Test for carbohydrates, fats and protein	Carry out test for a. carbohydrates, b. fats and c. protein
	2. Fermentation of cereals (e.g. maize, millet etc.)	Explain and Demonstrate the processes on fermentation of cereals
	3. Fermentation of tubers (e.g. cassava and sweet potatoes)	Carry out practical work and demonstrate the fermentation processes of tubers
	4. Milling process of cereals (wheat and maize)	Explain and demonstrate the milling process of cereals
	5. Pre- processing of tubers to produce flour e.g. (cassava and sweet potatoes)	Explain and demonstrate the pre-processing of tubers to flour.
	6. Pre- processing of legumes	Explain and demonstrate the pre-processing of legumes (e.g. soya bean flour and soya bean products).
	7. Use of Food Composition Table	Calculate nutrients content of foodstuffs with the use of Food Composition Table.
	8. Preparation of milk products (e.g. yoghurt and ice cream).	a. Analyze and Determine suitable milk for Yoghurt and ice cream b. Prepare milk products (e.g. yoghurt, ice cream etc.).
PART 2	**COOKERY PRACTICAL:**	
	1. Preparation of Traditional dishes from different Regions in Cameroon.	Prepare and cook variety of traditional dishes from different Regions in Cameroon
	2. Preparation of traditional snacks (e.g. corn and groundnuts,	Prepare and cook some traditional snacks.

TOPIC	SUBTOPICS and NOTES	OBJECTIVES Candidates shall be assessed on their ability to:
	groundnut paste and garden eggs, 'dakwa' etc.).	
	3. Preparation of steamed puddings, baked puddings and cold sweets	Prepare and cook variety of steamed puddings, baked puddings and cold sweets
	4. Production of flour products e.g. puff-puff, various types of bread, tarts, biscuits.	Prepare and cook variety of flour products.
	5. Preparation of foreign dishes (savouries, Hors d'oeuvres etc.).	Prepare and cook variety of foreign dishes
	6. Preparation of food for people with special health problems	Prepare and cook variety of food for special problems (e.g. diabetic, obesity, hypertension, anaemia etc.)
	7. Preparation of non-alcoholic beverages and local alcoholic beverages	a. Prepare variety of non- alcoholic beverages b. Prepare some local alcoholic beverages
	8. Preparation of jam (jam making)	a. Principle of Jam-making b. Prepare different types of jam (using different fruits) c. Experiment on the setting property of jam
	9. Baking and icing of cakes	a. Bake and ice cakes b. Explain reasons for faults in cake-making

11. Recommended Text Books and Other Resource Materials

1. Food and Nutrition by Anita Tull.
2. 'O' Level Cookery by P.M Abbey and G.M Macdonald.
3. Nutrition and diet therapy by Sue Rodwell Williams.
4. Food Science, Nutrition and Health by Brian A. Fox and Allan G. Cameron.
5. Cooking Explained by Barbara Hammoned.
6. Food technology (an introduction) by Anita Tull.
7. Guide to Body Chemistry and Nutrition by Dr. Bernard Jensen**.**

Special requirements for the subject.

1. Foods and Nutrition for WASSCE &SSCE by J.O. Olusanga, F. Bala, O. Eyisi, S. O. Olojola.
2. Tables of representative values of food commonly used in tropical countries by B.S. Platt.
3. International issues for nutrition strategies.

Other Useful Textbooks

Applied Nutrition Science I

1. Food and Nutrition by AnitaTull, OxfordUniversity Press,1996, Third EditionOxford OX26DP.
2. 'O' level cookery by P.M Abbey & G.M Macdonald Revised & updated edition 1976. Butter & Tanner LTD, Frome& London, ISBNO 423 886207
3. The Student's Cookery Book by Enid O' Reilly – Wright Oxford University Press ISBN 0198327110.
4. Foods and NUTRITION for WASSCE&SSCE by J.O. Olusanya, F. Bala, O. Eyisi, S.O.Olojola University Press PLC Ibadan 2000.
5. Cookery Explained by Barbara Hammond Publisher – Longman.

Food Consumption and Health II.

1. Nutrition and Diet -Therapy by Sue Rodwell Willaims 1993, C. V. Mosby Company.
2. Tables of representative values of foods commonly used in tropical countries by B.S Platt. London: Her Majesty's Stationery Office.
   Medical Research Council. Special Report Series No. 302 (revised edition of SRS 253). Ninth impression 1980. ISBN 0011 4500096.

Food Science III.

1. Food Science, Nutrition & Health by Brian A. Fox and Allan G. Cameron.
   SIXTH Edition 1995 by Edward Arnold a member of the Hodder Headline Group. 338 Euston Road, London NW13BH, ISBN 0340604832 5678910
2. Food Science and Technology by Magnus Pyke, Fourth Edition 1981 John Murray (Publishers) Ltd. ISBN0-7195-3850-5.

Community Health & Nutrition IV.

1. International Conference on Nutrition
2. Major issues for Nutrition Strategies

Summary 1992FAO and WHO, 1992Printed in Italy.

3. Oxford Dictionary of Food and Nutrition by Arnold E. Bender and David A. Bender.