

UNIVERSITY OF AGRICULTURE, ABEOKUTA
DEPARTMENT OF NUTRITION AND DIETETICS
2007/2008 FIRST SEMESTER EXAMINATION

COURSE: ASSESSMENT OF NUTRITIONAL STATUS (NUT 407)

INSTRUCTION: ANSWER ANY TWO (2) QUESTIONS IN EACH SECTION

TIME ALLOWED: 2 HOURS

SECTION A

1. Discuss at least four (4) advantages of anthropometric indices in nutritional assessment.
2.
 - a. what are the limitations of the index weight age?
 - b. state the advantage of the index weight for height
 - c. describe how you would measure the length of a 15 months old infant
3.
 - a. discuss the implications of stunting
 - b. how can the information on prevalence of stunting be used?
 - c. how can you measure body fat?

SECTION B

1.
 - a. which method of dietary assessment is most accurate and why?
 - b. what would you do to ensure reliability of 24 hours recall method of dietary assessment?
2. Explain three (3) advantages and two (2) disadvantages of using biochemical method in the assessment of nutritional status.
3.
 - a. Explain why hemoglobin (Hb) is regarded as the most important and useful index of the useful index of the overall state of nutrition.
 - b. write short notes on the standards for evaluating dietary intake.

UNIVERSITY OF AGRICULTURE, ABEOKUTA
DEPARTMENT OF NUTRITION AND DIETETICS
2007/2008 FIRST SEMESTER EXAMINATION

COURSE: INTERNATIONAL NUTRITION (NUT 405)
INSTRUCTION: ANSWER ANY FOUR (4) QUESTIONS IN ALL AT LEAST ONE QUESTION
IN EACH SECTION

TIME ALLOWED: 2 HOURS

SECTION A

1. Critically examine the risk factors to the food security and food insecurity at national and International levels.
2.
 - a. Outline the global challenges to Food and Nutrition.
 - b. Discuss the underlying immediate and basic causes of malnutrition at international levels.
3. What are the major causes of disaster? You have been appointed to manage a disaster zone as a nutritionist, how would you go about this work. Point out major indicators that would allow you in taking decisions.
4. Elaborate on the interaction of nutrition to the Millennium Developmental Goals. If Nigeria and Africa would meet up the goals what in your own opinion must be their target.
5. Discuss the contribution of any two of the following international organizations to Nutrition.
(a) WHO (b) RAO (c) UNDO (d) UNICEF (e) IFPRI

SECTION B

1.
 - a. State the basic assumptions of food and nutrition policies and briefly discuss two (2) with relevance to Nigeria.
 - b. Discuss how the 5W's of policy making can be used in a named nutritional disease condition.
 - c. with illustrations, outline the factors that influence the food and nutrition policy content of any society.
2.
 - a. What are the key areas that the food and nutrition policy for a low income group address?.
 - b. Policy on Recommended Dietary Allowance (RDA) should address what issues?
 - c. Highlight and discuss the roles of programme?

UNIVERSITY OF AGRICULTURE, ABEOKUTA
DEPARTMENT OF NUTRITION AND DIETETICS
2007/2008 FIRST SEMESTER EXAMINATION

COURSE: RECIPE DEVELOPMENT AND EVALUATION (NUT 401)

INSTRUCTION: ANSWER ANY THREE (3) QUESTIONS ONLY

TIME ALLOWED: 2 HOURS

1.
 - a. What do you understand by the term sensory evaluation?
 - b. Give a detailed account of the uses of sensory evaluation

2.
 - a. Explain the following as used in sensory evaluation techniques:
(i) Flavour (ii) Masking (iii) Bitter (iv) Analyst
(v) Rubbery (vi) Off Odour (vii) Translucent
(viii) Pastry (ix) Reference (x) Quality
 - b. Briefly describe how to perform sensory evaluation

3.
 - a. Highlight the factors affecting the reliability of sensory evaluation
 - b. Explain scoring tests in sensory evaluation.

4. Explain scoring tests in sensory tests:
 - a. Triangle and Duo-trio tests
 - b. Simple paired comparison tests
 - c. Ranking tests
 - d. Multi comparison test

UNIVERSITY OF AGRICULTURE, ABEOKUTA
DEPARTMENT OF NUTRITION AND DIETETICS
2007/2008 FIRST SEMESTER EXAMINATION

COURSE: NUTRITIONAL BIOCHEMISTRY (NUT 409)

INSTRUCTION: ANSWER ANY TWO (2) QUESTIONS IN EACH SECTION

TIME ALLOWED: 2 HOURS

SECTION A

1. Write short notes on three (3) of the following
 - a. Phosphate energy rich compounds
 - b. Hydrogen carriers
 - c. Amphibolic metabolic pathways.
 - d. Free energy
2. Discuss metabolism at tissue and organ level
3. Give a brief account of the
 - (i) Structure of DNA
 - (ii) Information content
 - (iii) Replication

SECTION B

1. Explain the metabolism in gout and phenylketonuria (PKU)
2.
 - a. Discuss diabetes acidosis
 - b. Explain the biochemistry of Protein Energy Malnutrition (PEM)
3. Write short notes on the following
 - a. Hyperlipidaemias
 - b. Toxins and detoxifications in animal system.

UNIVERSITY OF AGRICULTURE, ABEOKUTA
DEPARTMENT OF NUTRITION AND DIETETICS
2009/2010 FIRST SEMESTER EXAMINATION

COURSE: RECIPE DEVELOPMENT AND EVALUATION (NUT 401)

INSTRUCTION: ANSWER ALL QUESTIONS

TIME ALLOWED: 1 HOUR 45MINS.

1.
 - (a) Define standardized recipe
 - (b) what are the components of recipe standardization?

2.
 - (a) List the reasons for cooking food
 - (b) List the various cooking methods usually employed during recipe development
 - (c) Write briefly on any three (3) listed above

3.
 - (a) What is sensory evaluation of foods?
 - (b) Highlight the uses of sensory evaluation in recipe development
 - (c) State the basic steps to be followed when conduction sensory evaluation.

UNIVERSITY OF AGRICULTURE, ABEOKUTA
DEPARTMENT OF NUTRITION AND DIETETICS
2007/2008 FIRST SEMESTER EXAMINATION

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**UNIVERSITY OF AGRICULTURE, ABEOKUTA
DEPARTMENT OF NUTRITION AND DIETETICS
2007/2008 FIRST SEMESTER EXAMINATION**

COURSE: INTERNATIONAL NUTRITION (NUT 405)
INSTRUCTION: ANSWER ANY FOUR (4) QUESTIONS IN ALL AT LEAST ONE QUESTION
IN EACH SECTION

TIME ALLOWED: 2 HOURS

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2007/2008 FIRST SEMESTER EXAMINATION

COURSE: NUTRITIONAL BIOCHEMISTRY (NUT 409)

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SECTION A

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UNIVERSITY OF AGRICULTURE, ABEOKUTA
COLLEGE OF FOOD SCIENCE AND HUMAN ECOLOGY (COLFHEC)
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY
B.Sc. Degree Examinations
First Semester 2008/2009 Session
October, 2009

FST 403: Fruits and Vegetable Technology

Time: 2 Hrs.

INSTRUCTION

Answer four (4) questions in all. Two question from each section. Each question carries 25 marks.

SECTION A

- 1(a) Define vegetables. Write out the categories of vegetables with 2 examples each.
 - (b) Distinguish between maturity and ripeness of fruits. Describe the quality measurements of mature fruits.
 - (c) What are the essential rules for manual fruit harvesting?
 - (d) Enumerate the importance of enzymes in fruits and vegetable processing technology.
2. Explain in detail the importance of organic acids and carbohydrates in fruits and vegetables.
- 3(a) Describe the climatic behaviour of fruits with examples.
 - (b) (i) Differentiate between CA and MA storage
(ii) What are the conditions of storage for apples stored under CA and normal cold storage?
 - (c) Highlight the essential considerations for constructing a CA storage room for fruits and vegetables.
 - (d) List the quality and quantity checks carried out on fruits and vegetable at the processing factory reception.

SECTION B

Answer two (2) questions from this section

- 1(a) Enumerate the advantages of the following pre-treatment operations in vegetable dehydration:
(i) Blanching (ii) Trimming (iii) Sorting
 - (b) Explain why fruits are generally not amenable to blanching. Suggest alternative pretreatment suitable for fruits.
2. Give a critical evaluation of the appropriateness of the following preservation techniques for fruits and vegetables in a developing country such as Nigeria.
(a) Canning (b) Solar drying (c) Freezing
- 3(a) Describe with appropriate flow chart the processing of a named sugar preserve. Mention the critical factors which determine quality of the product.
 - (b) What is invert sugar, explain briefly the significance in the manufacture of sugar preserve.

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DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY
B.Sc. Degree Examinations
First Semester 2008/2009 Session
October, 2009

FST 413: Scientific writing and presentation

Time: 2 Hrs.

INSTRUCTION

Answer all questions

SECTION A

1. Research reports are written by Scientist for some purposes. What are those purposes?
2. There are some common ways of listing references in scientific communication. List the ones you know.
3. In Science, there are various ways through which original scientific finding could be communicated. Name them.
4. What is the full meaning of IMRAD?
5. A poster presentation is said to be good if some major elements are present. What are these major elements?
6. In Scientific conferences, abstract are usually presented to communicate scientific information. Name the types of abstract used.
7. Define a research journal.
8. Why is there a need for a research journal?
9. Name the different types of readers of research papers.
10. Mention at least three (3) research journals in your field of study.
11. A good illustration for scientific presentation has some basic peculiar properties. Mention these properties in a concise manner.
12. Three common web browser you know are:
13. Write the functional web address of University of Agriculture, Abeokuta.
14. Mention at least five links available on the UNAAB website.

SECTION B

1. In a clear and concise manner, write a typical research proposal on a topic of interest. Credit will be given for proper and correct outlining of a standard research proposal.

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DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY
B.Sc. Degree Examinations
First Semester 2008/2009 Session
October, 2009

FST 409: Food Plant Design and Pilot Demonstration

Time: 2½ Hrs.

INSTRUCTION

Answer four (4) questions in all

- 1(a) What do you understand by term 'food plant'?
- (b) Briefly explain the concept of 'sanitary design' of a food plant.
- (c) Outline the factors considered in plant location. Discuss any two of the critical factors.

2. Write a comprehensive note on any **2** of the following:
 - (a) Technical feasibility of an investment project
 - (b) Present value of an asset.
 - (c) Material flow in food processing
 - (d) Why is depreciation cost important to a project's cost accounting?

- 3(a) Identify major segments of the food industry.
- (b) What is service life?
- (c) Outline various ways by which a physical asset can depreciate.
- (d) What is a viable project?

- 4(a) List various methods of evaluating the profitability of an investment.
- (b) Explain what are likely to constitute the fixed and working capital investments of a food processing company?
- (c) The table below shows the capital expenditures and estimated profits of different business alternatives. Determine the total costs and their rate of return and conclude the best investment option.

Option	Fixed Cost	Recurrent Cost (₦/Yr.)	Profit (₦/Yr.)
A	23,400,000	6,600,000	10,000,000
B	2,000,000	500,000	400,000
C	13,500,450	4,250,000	1,250,000
D	5,000,000	1,500,000	500,000

- 5(a) Discuss briefly the advantages of straight line and declining balance methods of depreciating an asset.

- (b) A piece of equipment originally cost N400,000 with an estimated service life of 20 years, the salvage value was assumed to be equal to N25,000. Presently, the equipment is 6 years old and a more advanced model of the equipment now costs N550,000. Determine the replacement value of the equipment if:
 - (c) (i) Straight line depreciation method is used
 - (ii) Declining balance method is used.

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DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY
B.Sc. Degree Examinations
First Semester 2008/2009 Session
October, 2009

FST 407: Food Product Development

Time: 1Hr. 45 mins.

INSTRUCTION

Answer four(4) questions only

- 1(a) What is a Product Development Process (PDP) and how does it work?
 - (b) Draw a well labelled diagram of a PDP and define the following terms: stages, Gates and Gatekeepers.
 - (c) What are the general reasons for new product failure?
-
- 2 (a) Highlight the key decisions throughout the process of PDP.
 - (b) What are the benefits of PDP?
 - (c) Enumerate the considerations at STAGE 3 and GATE 4.
-
- 3 (a) Define Perceptual Map, Gap Analysis and Product Attractiveness.
 - (b) (i) Draw the score table for REWARD and TECHNICAL Risk in Product Attractiveness.
(ii) Use the data in the table to calculate the percentage REWARD for chocolate biscuit product whose points are: moderate, this year, several years and supportive respectively.
-
- 4(a) Differentiate between protocept and prototype.
 - (b) What are the considerations and uses of pilot plant studies?
 - (c) At what point should Performance Test be carried out?
 - (d) In salad dressing, explain the considerations for the most critical raw material.
-
- 5(a) Define Food Specification. What are the components and sources of food specifications?
 - (b) In food manufacturing, what are the factors that determine how much of products to produce.
 - (c) What are the possible measures of ROLLOUT Success?

(d) **UNIVERSITY OF AGRICULTURE, ABEOKUTA**
(e) **COLLEGE OF FOOD SCIENCE AND HUMAN ECOLOGY (COLFHEC)**
(f) **DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY**

(g) **B.Sc. Degree Examinations**
(h) **First Semester 2008/2009 Session**

(i) **October, 2009**

(j) **FST 405: Dairy Science and Technology**

Time: 2½ Hrs.

(k)

(l) **INSTRUCTION**

(m)

(n) *Answer all question in Section A and any two (2) from section B*

(o)

(p) **SECTION A (50 MARKS)**

(q)

- (r) 1. Name two (2) common dye reduction tests applied to milk.
- (s) 2. Name the hormone that is released by the cow to begin the process of milk let-down.
- (t) 3. List four (4) terms used to describe milk fractions.
- (u) 4. Give three (3) descriptions of milk.
- (v) 5. List two (2) parameters used to measure milk acidity.
- (w) 6. Give three functional properties of milk fat.
- (x) 7. What is the functional property of Lactose in milk?
- (y) 8. Mention three (3) importance of milk density
- (z) 9. List two (2) spoilage microorganisms in milk.
- (aa) 10. Name the major process involved in the production of the following dairy foods:
- (bb) (a) Cheese (b) Yoghurt (c) Butter (d) Condensed milk
- (cc)
- (dd) 11. State the conditions involved in each of the following stages of butter manufacture:
- (ee) (a) Neutralization (b) Pasteurization (c) Cooling
- (ff)
- (gg) 12. Mention three (3) importance of milk viscosity.
- (hh) 13. What is the recommended milking time(s) per day for a good dairy cow?
- (ii) 14. List three (3) heat treatment types applied to milk products.
- (jj) 15. Name the major protein, carbohydrate and mineral element present in milk.
- (kk) 16. List four (4) diseases associated with milk consumption.
- (ll) 17. Name two (2) processes used to produce milk powders.
- (mm) 18. What is "Wara"?

(nn)

(oo) **SECTION B (50 MARKS)**

(pp)

- (qq) 1. Private milk processing plants mainly engage in recombining imported powdered milk for distribution to urban consumers. Highlight the major reasons responsible for this situation and propose solutions for the way out.

(rr)

- (tt) 2a (i) Define the term 'starter cultures'
- (uu) (ii) What is the main feature/advantage of using starter cultures?
- (vv) (iii) List four (4) functions of starter cultures.
- (ww) (iv) List four (4) examples of starter cultures.
- (xx)
- (yy) 2b. Highlight the principal steps involved in the production of cheese.
- (zz)
- (aaa) 3a. What is the role of each of the following stages involved in butter manufacture:
- (bbb) (i) Separation (ii) Standardization (iii) Neutralization (iv) Pasteurization
- (ccc) (v) Storage overnight.
- (ddd)
- (eee) 3b. Highlight the factors that affect milk variations.
- (fff)
- (ggg) 3c. List the components of milk and give examples where applicable.

SECTION A
UNIVERSITY OF AGRICULTURE, ABEOKUTA
 COLLEGE OF FOOD SCIENCE AND HUMAN ECOLOGY (COLFHEC)
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY
B.Sc. Degree Examinations
First Semester 2008/2009 Session
October, 2009

FST 401: Food Quality Control and Plant Sanitation

Time: 2½ Hrs.

INSTRUCTION

Answer Question 1 and any other three.

1. The table below shows the weight of bottled beer of a particular brand. Calculate the trial control limits for setting up the mean (\bar{x}) and range charts for the production line. Based on the charts obtained, advice the management of the brewery on the next line of action.

Processing time (Hr)	Weight			
	I	II	III	IV
8.00 am	540	544	548	545
9.00 am	541	543	542	542
10.00 am	542	540	546	543
11.00 am	540	545	545	544
12.00 pm	540	546	546	543
1.00 p.m.	554	548	552	550
2.00 p.m.	550	548	540	552
3.00 p.m.	540	541	544	541
4.00 p.m.	548	552	554	550
5.00 p.m.	554	553	546	550

Credit will be given for clear and neat diagrams.

- 2 (a) In a clear manner, briefly explain why quality assurance is necessary in a food plant operation.
 (b) What are the factors that determines the need to develop a new quality control methods in an established food processing industry?
 (c) Specification limits in food quality control is very essential. What does it plan to achieve during a typical food quality control process?
- 3 (a) In a clear manner and as concise as possible, state the HACCP principles as highlighted by National Advisory Committee on Microbiological criteria for foods (NACMCF) in 1992?
 (b) Briefly explain those factors to be considered during the design of plant to ensure hygiene.
- 4 (a) Surfactants are active agents presents in detergents used in achieving sanitation in the food industry. Clearly explain concisely, the various types you know.
 (b) With the aid of a very clear diagram, briefly explain the different processes of chlorination you know.
- 5 (a) Tests using scales and categories are very important in sensory quality control of food materials. Explain briefly the ones you know.
 (b) Mention four importance of statistical quality control in the food industry.
 (c) Write the equations used in estimating the control limits in a mean control chart.

UNIVERSITY OF AGRICULTURE, ABEOKUTA

COLLEGE OF AGRICULTURAL MANAGEMENT, RURAL DEVELOPMENT AND
CONSUMER STUDIES

DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

B.Sc. Degree Examinations
First Semester 2007/2008 Session
July, 2008

FST 411: Malting and Brewing

Time: 2hrs.

INSTRUCTION

Answer Question 1 and any other 3 questions.

- 1 (a) How would you malt a 2kg sample of sorghum grains for use in beer or malt drink manufacture in your laboratory?
- (b) Outline the steps and precautions you would take to obtain fermentable extract from the malted grain in (a) above.
- (c) How does industrial pneumatic malting differ from the process you described in (a) above?
- 2 (a) What are the functions of the following grain structures in malting?
 - (i) Aleurone layer
 - (ii) Endosperm
 - (iii) Embryo
- (b) What are the essential changes which take place during grain modification?
- 3 (a) What are the variables influencing colour and flavour development in malt kilning?
- (b) What kilning conditions should be selected in order to produce:
 - (i) dark malt, high in sugars and amino acids but still with acceptable enzyme level.
 - (ii) Highly enzymic light-coloured malt
 - (iii) Crystal or caramel malt
- (c) How does the degree of modification of a malt influence the mashing method used for it in brewing?
- 4 (a) What are the critical factors to consider during malt milling?
- (b) What are the effects of different protein fractions of the mash on fermentation and the final beer or malt drink?
- (c) How does the quality of the brewing water affect the brewing process and final product?
- 5 (a) Why do we need to boil sweet wort before pitching it with yeast?
- (b) What are the factors to consider in choosing a brewing yeast?
- (c) What are three major changes that take place during beer aging?
- (d) Describe the easiest method for chill-proofing beer. Why are the other methods less popular?

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DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY
B.Sc. Degree Examinations
First Semester 2007/2008 Session
July, 2008

FST 413: Scientific Writing and Presentation

Time Allowed: 2 Hrs.

INSTRUCTION

Answer All Questions

SECTION A

1. Mention the major reasons why research reports are written.
2. There are different styles of reference listings. Mention the ones you know.
3. List five vehicles through which scientific findings can be communicated
4. What does IMRAD stands for?
5. What are the major elements of a good poster?
6. Abstracts are usually presented in scientific conferences. Mention the various types you know.
7. What is a research proposal?
8. The main purpose of a research journal is?
9. Research papers are usually read by different classes of people. Name them.
10. A good illustration is a pre-requisite for most scientific presentations. What are the major properties of a good illustration?
11. Mention the various types of illustrations used in scientific presentation
12. Name at least three web browser that you know.
13. What is the web address of the University of Agriculture, Abeokuta?

SECTION B

Taking into consideration the major sections of a research proposal, write in a clear and concise manner a typical research proposal in your field of study.

SECTION C

Using the Name-year style of reference listing, carefully re-write correctly the reference listings below:

1. O.P. Sobukola, Awonorin, S.O., Sanni, L.O. and Bamiro, F.O. International Journal of Food Properties. Vol. II(2), 379-391. Optimization of blanching condition prior to deep fat frying of yam slices. 2008.

2. Journal of Food Processing and Preservation. Sobukola, O.P., Awonorin, S.O., Sanni, L.O. and Bamiro, F.O. Vol. 32. Deep fat frying of yam slices: Optimization of processing conditions using response surface methodology. 2008, 343-360.
3. Chemical Research Toxicology. Nickelson, M.G., Nweke, A., Scully, F.E. Jr., and Ringhand, H.P. 1991, Vol 4 (1): 94-101. Reactions of aqueous chlorine in vitro in stomach fluid from the rat: Chlorine of tyrosine.
4. Exo, J.H., Kller, H.D., O'Reilly, C.A. and Bercz, J.P. 1987. Immunotoxicologic evaluation of chlorine based drinking water disinfectants, sodium hypo-chlorate and monochloroamine. 44(3): 257-269.
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FST 409: Food Plant Design & Pilot Demonstration

Time Allowed: 2 ½ Hrs.

INSTRUCTION

Answer four (4) questions only.

- 1 (a) What is a food plant?
(b) Outline and briefly explain the important stages involved in the design of a manufacturing plant.
(c) State the critical factors to be considered in plant site selection.
- 2 Write a comprehensive note on any 2 of the following:
(i) Technical feasibility of an investment project.
(ii) Present value of an asset.
(iii) Process flow chart.
- 3 (a) List various methods of evaluating the profitability of an investment.
(b) Explain what are likely to constitute the fixed and working capital investments with reference to a named food manufacturing set up.
Hints: You may use your class assignment to enhance your explanation.
(c) When is a project deemed to be viable?
- 4 (a) Briefly outline various ways which a physical asset can depreciate.
(b) Why is depreciation cost important in the cost accounting of a manufacturing plant?
(c) What is service life?
- 5 (a) Discuss briefly the advantages of straight line and declining balance methods of depreciating an asset.
(b) A piece of equipment originally cost N400,000. With an estimated service life of 20 years, the salvage value was assumed to be equal N25,000. Presently, the equipment is 6 years old and a more advanced model of the equipment now costs N550,000. Determine the replacement value of the equipment if:
(i) Straight line depreciation method is used.
(ii) Declining balance method is used.

6. For a particular investment, the initial fixed capital and working capital investments are N100,000,000 and N10,000,000 respectively. The expected service life is 5 years with a salvage value of N10,000,000. The table below indicates the cash flow (after-tax) to the project based on total income minus all cost except depreciation at the end of each year.

Year	Cash flow (N)
0	(110,000,000)
1	30,000,000
2	31,000,000
3	36,000,000
4	40,000,000
5	43,000,000

The total present value at the end of 5 years of the investment at various rate of returns are shown below:

Rate of return i	Present value (N)
0.15	127,000,000
0.20	111,800,000
0.25	99,200,000

Estimate the present value of the investment if the rate of return is maintained at 0.22. The discounted factor is defined as:

$$dn = \frac{1}{(1 + i)^n}$$

n^1 = year of project life to which cash flow applies.

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FST 403: Fruits and Vegetable Technology

Time Allowed: 2Hrs.

INSTRUCTION

Answer four (4) questions only.

- 1 (a) Highlight the major classes of fruits and vegetables and give 2 examples for each.
(b) Write a short note on cashew fruit
(c) Explain in detail the organic acid composition of fruits and vegetables.
2. Discuss the post harvest physiological changes in composition of fruits.
- 3 (a) Define the following terms: fruit maturity, fruit ripening, climacteric behaviour of fruits and fruit ethylene.
(b) Explain the term, Controlled Atmospheric Technology
- 4 (a) Explain the principle of lye peeling.
(b) Enumerate the advantages of vegetable blanching.
(c) Describe the preservation of fruits and vegetables by pickling. Write short note on the production of Sauerkraut.
- 5 (a) Distinguish between single-strength and concentrated fruit juices; fruit drink and squash.
(b) Describe the steps in the production of Tomato puree and glace cherries, using flow diagram.
- 6 (a) Write short note on the following unit operations carried out on fruit juice/concentrate:
 - (i) Filtration
 - (ii) Deaeration
 - (iii) Vacuum concentration
(b) Differentiate between Jellies, Marmalades and Jams

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FST 407: Food Product Development

Time Allowed: 2Hrs.

INSTRUCTION

Answer four (4) questions only

- 1 (a) What is food product development?
(b) How can existing product be modified or adapted?
(c) Explain the considerations for new product development.
- 2 (a) Enumerate 10 foreign food products and their indigenous substitutes.
(b) Highlight the key elements in determining who the consumers are.
(c) What are the basic considerations and the strategies for new food product development?
- 3 (a) In product development, what are the 4 Ps?
(b) Explain the product pricing strategy.
(c) List the main functions of product packaging.
- 4 (a) Distinguish between market pull and Technological push.
(b) What are the advantages of Competing Product Analysis?
(c) In detail, describe the product life cycle.
- 5 (a) How can Technological Opportunities be identified?
(b) Describe the SWOT and PEST analyses
- 6 (a) In product development, what are the basic steps in solving Linear programming?
(b) Explain the essential components in Mathematical model for product development.
(c) A food processor wishes to develop a baked product by substituting ingredient X_1 with X_2 . The objective is to minimize the cost of the raw material. The final mix (100kg) must not contain less than 20% protein, 5% fat, 3.5% ash, 60% Carbohydrate and 5% moisture content. The cost and composition of each component is shown below:

P.T.O

	Ingredient	
	X_1	X_2
Cost (N/kg)	180	50
Protein (%)	25	18
Fat (%)	6.5	2.5
Ash (%)	2.5	4.5

Carbohydrate (%)	60	70
Moisture (%)	5	5

Translate the above problem to a mathematic model.

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FST 405: Dairy Science & Technology

Time Allowed: 2Hrs.

INSTRUCTION

Answer all questions in Section A and three questions from Section B

SECTION A

1. Give the nutritional significance of ice-cream.
2. List two (2) types of milking machines
3. A consumer suffers from lactose intolerance, yet desires a dairy product. Suggest a solution to this situation.
4. Why is milk regarded as nature's most complete single food?
5. Highlight two (2) factors affecting the secretion and composition of milk.
6. Name one milk product resulting from each of the following processing operations:
 (a) Coagulation (b) Fermentation. (c) Concentration (d) Churning

Complete the following table:

	<u>Milk borne disease</u>	<u>Causative agent</u>	<u>Symptoms</u>
7.	Brucellosis		
8.		<u>Coxiella burnetti</u>	
9.			Influenza & Typhoid
10.	With the aid of a graph only , show the relationship between udder pressure, milk secretion and spacing between milkings.		
11.	Name two (2) processes used in the production of milk powders.		
12.	What is the most important factor that influences the flavour of yoghurt?		
13.	Name the source of the coagulator used in the production of 'wara'.		

SECTION B

- 1 (a) Describe the processing operations involved in the production of butter, and highlight the significance of each operation.
 - (b) i. What are the factors that influence the quality of butter?
 - ii. Identify the characteristics of a good quality butter.
- 2 (a) Distinguish between the characteristics of unfrozen ice-cream mix and frozen ice-cream.
 - (b) Explain briefly the term “homogenization” and give its application in ice-cream production.
 - (c) Highlight the importance of milk as a food.
- 3 (a) What are the general considerations in the choice of heating conditions during the thermal processing of milk.
 - (b) Describe the methods and conditions, as well as the effect of the following heat treatment applied to milk products:
 - (i) Pasteurization
 - (ii) Sterilization
 - (iii) Thermization
- 4 (a) What is the current status of dairy industries in Nigeria?
 - (b) Discuss the prospects and challenges facing the Nigerian dairy industry.

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FST 401: Food Quality Control & Plant Sanitation Time Allowed: 2 Hrs.

INSTRUCTION

SECTION A

Answer all questions in section A and any other two questions in section B.

1. Briefly discuss the preliminary steps that should be taken into consideration in the implementation of hazard analysis critical control points (HACCP) technique during production of “Robo” a street vended melon snack.
2. By means of a structured, quantitative and qualitative methodology, briefly explain an alternative approach to implementation of the first and second principles of HACCP
3. In what ways will conformation to specification agreed to between suppliers and processors of cassava roots affects the success of the processing industry?
4. Contamination in a food processing environment is a serious problem that should be avoided. Highlight the various modes of contamination within such environment.
5. Define the following as it relates to application of chemicals in achieving sterilization in a food processing environment:
 - (a) Organic dissolving power
 - (b) Sequestering power
 - (c) Buffering action
 - (d) Chlorine demand
 - (e) Marginal chlorination

SECTION B

- 1 (a) Differentiate between the following:
 - (i) Attribute and countable data
 - (ii) Continuous and discrete variables
 - (iii) Type I and Type II errors
 - (iv) Multiple and sequential sampling plans
 - (v) Variable and attribute data

- (b) Briefly explain the major factors that determine the efficiency of chlorine solution in controlling bacteria in a food processing industry.
 - (c) In order to establish a quality control programme for a fried yam crisps processing industry, some factors must be taken into consideration. Examine these factors in a concise manner.
- 2
- (a) Successful application of a detergent solution in achieving sterility in a processing environment is a function of the surfactants present. Briefly explain this statement.
 - (b) A food processor has approached you to develop a new quality control test method for his product. What do you think are the reasons behind his actions?
 - (c) Outline some reasons why statistical quality control is important in the food industry?
- 3
- (a) Using a well labeled diagram ONLY, show the operating characteristic curve for a single sampling plan.
 - (b) A production process can be effectively controlled using control charts. What are the main objectives of its use in food quality control?
 - (c) With a clear diagram ONLY, show a typical shewhart mean control charts (Note: All the limits must be shown clearly).
 - (d) Briefly explain the various types of chlorination methods used in the food industry with the aid of a relevant diagram.

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FST 411: Malting and Brewing Technology

Time: 2 Hrs.

Instruction

Answer FOUR (4) questions

- 1 (a) Draw and label the structure of a named cereal used in malting.
(b) Enumerate the laboratory tests used in determining the suitability of a grain for malting.

- 2 (a) What is mashing?
(b) List the factors that affect mashing and explain.
(c) Discuss the different methods of mashing used in the production of wort.

- 3 (a) Enumerate the different methods of malting.
(b) During kilning of grains, some biochemical reactions occurred. Explain.
(c) List the different factors involved in colour development in malt.

- 4 (a) Explain the biochemical activities that occurred during germination of cereals.
(b) (i) What is adjunct
(ii) What are the factors that limit adjunct used.

5. Write short notes on the following activities during beer production.
 - (i) Wort boiling
 - (ii) Aging
 - (iii) Wort cooling
 - (iv) Fermentation.

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FST 405: Dairy Science and Technology

Time: 2 Hrs.

Instruction

Answer FOUR (4) questions

- 1 (a) Mention and explain five factors that affect milk composition
- (b) List and explain different factors that affect milk yield.

- 2 (a) Discuss the important of heat treatment during milk processing.
- (b) Milk may serve not only as a potential vehicle of transmission of disease causing organisms but it can also allow these pathogens to grow, multiply and produce certain toxic metabolites, thereby making itself an extremely vulnerable commodity from the public health point of view. Discuss.

- 3 (a) Discuss the importance of food safety in dairy industries.
- (b) Good quality dairy products can never be made from poor quality raw milk. Discuss the attributes of good quality raw milk.

- 4 (a) In a tabular form explain the common milk-borne infections, intoxications and toxic-infections.
- (b) Pathogenic organisms can get into milk through three major means. Discuss.
- (c) Explain how milk borne diseases can be control.

5. As a food technologist, explain how hygienic milk handling and processing can be achieved.

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FST 401: Food Quality Control and Plant Sanitation

Time: 2 Hrs. 15 mins.

Instruction

Answer all questions in Section A and any 2 other one in Section B

SECTION 'A'

- 1.
2. Define Food quality Assurance.
3. List those factors that can militate against correct application of Food quality control programme.
4. Mention the essential requirements for successful implementation of Total Quality Management (TQM).
5. Outline the various stages required for effective food quality control.
6. State clearly the importance of specifications in the maintenance of quality control of food materials.
7. Based on levels, mention the various classification of Food standards that you know.
8. Define HACCP
9. Mention at least four major sources of contamination of food materials in a typical food processing industry.
10. Itemise the basic principles of hygienic design in a food manufacturing plant.
11. Define CIP and mention the various types that you know.
12. Write short notes on the following: (a) Anionic surfactant (b) cationic surfactant (c) Non-ionic surfactant.
13. Briefly explain the factors that governs the efficiency of chlorine when added to water.

/2

SECTION 'B'

1. The data below shows the fill-in-weight for every hour in a beverage industry. Four samples were taken hourly during the mixing session and the volume (ml) recorded are as shown below:

Time	Sub-group	X_1	X_2	X_3	X_4
9.00 a.m.	1	51	55	51	53
10.00 a.m.	2	52	52	57	50
11.00 a.m.	3	48	49	50	49
12.00 p.m.	4	45	43	45	43
1.00 p.m.	5	53	50	48	50

Assuming $A_2 = 0.729$, $D_4 = 2.282$ and $D_3 = 0$, draw the mean and range charts for the industry. Hence, make your conclusions and advice the management of the company on the next step to take.

2. A production process makes batches of can coca cola consisting of 100 components. At a period referred to as critical stage, the quality controller observed the number of defective components in each batch is shown below. Calculate the upper action limit and the upper warning limit needed by the operator to take appropriate decision.

Batch Number	Number of cans inspected	Number of defective cans
1	100	4
2	100	2
3	100	5
4	100	3
5	100	7
6	100	2
7	100	3
8	100	3
9	100	4
10	100	3

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FST 403: Fruits and Vegetable Technology

Time: 2 Hrs. 15 mins.

Instruction

Answer all questions in Section A and any 2 questions in Section B (Use answer booklet for all answers) Each section carries 50 marks

SECTION A

1. Fruits are _____
2. Vegetables are _____
3. Compositions of vegetables and fruit vary for a given _____ in according to _____, _____, and _____, the _____ prior to harvest, and the condition of _____.
4. Vegetables contain generally _____% water while for fruit normal water content is _____%.
5. _____ are common in fruits and vegetables, in solution form gels when sugar and acid are added.
6. _____ and _____ are two main substances which determine the taste of fruit.
7. During post harvest physiological changes of green maize, _____ decrease and _____ increases while continuous ripening of fruit results in decrease in _____ and _____, increase in _____.
8. After fruit harvest, unless destroyed by _____ or _____, _____ continue the ripening process.
9. _____ have long ripening period.
10. _____, _____, _____, _____ are examples of fruit and vegetable enzymes. (Any 4)
11. If freshly prepared tomato juice or paste is allowed to stand the _____ gradually _____ due to the action of _____ on _____ gel, this called _____.
12. Quick application of _____ deactivate _____ and yield tomato juice of _____ viscosity is called _____.
13. The four major groups of fruit and vegetable pigments are classified into _____, _____, _____ and _____.

/2

14. When the vegetable are cooked, the protein of these complexes is denatured and the _____ is rapidly converted to the compound _____ which is _____ and _____ in colour.
15. Cooking of beets with _____ tends to shift the colour from _____ to _____, while alkaline water can influence the colour of _____ fruits and vegetables toward _____ and _____ due to presence of _____ pigment.
16. Potatoes become _____ when cooked in water at pH _____.
17. Fruit picking depends upon _____, _____, _____, _____ and _____.
18. Fruit quality depend on _____ and _____.
19. Commonly _____ SO₂ solution or its SO₂ equivalent in the form of solutions of _____ can be used for pre-treatment of fruits and vegetables.
20. Sugar syrup addition to fruits is used to _____, _____ and _____.
21. Vegetable blanching is done to _____ also _____.
22. The **three typical temperature and time** of Flash pasteurization of fruit juice are _____.
23. The condition for osmotic-dehydration of banana are _____ size of slice, treatment with _____ sugar, _____ SO₂ for _____ hours and drying at _____.
24. Fruit juices are obtained _____ while Fruit syrups are _____.
25. Osmoappertisation is _____.

SECTION B (answer 2 out of 3 questions)

1. Differentiate between:
 - i. Maturity and Ripeness of fruits.
 - ii. CA and MA.
 - iii. fruit juice, fruit syrup and fruit concentrate.
 - iv. Marmalade and fruit paste.
 - v. Bulk Sauerkraut and Pickles.

2.
 - i. One of the deteriorative factors in fruit and vegetables is enzymic changes, highlight the possible changes and their controls.
 - ii. Describe the Quality measurements of fruits.
 - iii. What are the essential rules for manual harvesting?
 - iv. Highlight the major reasons for fruit and vegetable processing.
 - v. Describe the production of tomato juice in a flow chart.

3.
 - i. Make a list of the quality control checks at the reception of fruits and vegetables.
 - ii. Describe the methods of fruit washing, their advantages and precautions.
 - iii. What are the basic drying process for fruits and vegetables, give examples of dryers for each?
 - iv. Describe the general procedure for fruit jam production.

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FST 407: Food Product Development

Time: 2 Hrs. 15 mins.

Instruction

Answer all questions in Section A and any 2 questions in Section B (Use answer booklet for all answers). Each section carries 50 marks

SECTION A

1. The main reasons for product development are: _____ ,

_____ and
_____.
2. Stage-Gate is a _____, or _____, for driving new product projects from
_____ to _____ and beyond.
3. Each stage contains _____
4. Gates are _____
5. Perceptual
Map _____
6. Gap Analysis is

7. In Product Attractiveness, a score card is used to evaluate the potentials such as _____,
_____, _____ and _____
8. _____, _____, _____,
_____ and _____ are some of the factors which drive
the success of a new product.
9. The Cost or percentage score of being Second to reach the market is _____
10. The heart of any new product is in _____
11. Scale-up is _____
12. _____, _____ and _____ are sources for food product
specification
13. Examples of what to specify in product development are _____,
_____, _____, and _____ -
14. The components of Food Specification are _____, _____ and _____
15. The basic steps in carrying out a plant trial are _____, _____, _____,
_____, _____, _____, _____, _____,

16. A plant trial is run after _____;before

_____ when

17. The watch outs in conducting plant trials are _____, _____ and

- 2 -

18. When the process starts, they end in _____

19. _____ is getting rid of what you've got while _____ is having what you can get rid.

20. The 4 Ps of marketing are _____, _____, _____ and

SECTION B (answer 2 out of 3 questions)

- 1 a. Draw a well labeled diagram of a typical Stage-Gate process.
- b. Highlight all the considerations for Stages 0 and 1; Gates 1 and 2.

- 2 a. Differentiate between Protocept and Prototype.
- b. Define a flow chart. Draw the mass balance for concentrated orange juice production.
- c. Calculate the Percentage Reward for osmotic dehydrated banana slices having: moderate; this year; many years; make us look great - scores for: How much, How soon, How long and Company's image respectively.
- d. Why do we conduct Pilot Plant Studies?

- 3 a. What are the uses of Pilot Plant?
- b. Scale up the product you have developed from the laboratory scale to pilot plant scale.
- c. Explain and Draw the graph illustrating a product life cycle.
- d. What are the Measures of rollout success?

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FST 409: Food Plant Design and Pilot Demonstration

Time: 2½ Hrs.

Instruction

Answer four (4) questions in all

1. a. A food plant can be conceived as a *living entity*. Discuss.
b. Outline the various stages in designing a food plant and explain briefly the various activities in any two of the stages mentioned.
2. Write short notes on the following:
 - a. Optimum design.
 - b. Preliminary design.
 - c. Differences and relationship between process design and plant design
3. a. Give reasons why sanitary design is important in the construction of a food plant?
b. Discuss in detail about sanitary design of a food plant.
4. a. What are the sanitary considerations in the construction of a food plant for low-moisture food manufacturing and storage sanitation?

b. What chemical resistant floors are recommended in wet-washed areas of a food plant?
c. What percentage slope should exist in wet-washed areas of low-moisture food plants?
5. a. What is process flow diagram?

b. Mention and differentiate between the three major categories of the process flow diagram
c. Describe a process for converting raw cassava to a named product using simple **qualitative flow diagram** only.
6. a. Explain what are likely to constitute the fixed and working capital investments of a named food plant?

b. A proposed food manufacturing plant requires an initial fixed-capital investment of ₦90, 000, 000 and ₦10, 000, 000 of working capital. It is estimated that the annual income will be \$80,000,000 and the annual expenses including depreciation will be ₦52, 000, 000 before income taxes. A minimum annual return of 15 percent before income taxes is required before the investment will be worthwhile. Income taxes amount to 34 percent of all pre-tax profits. Determine the following:
 - (i) The annual percent return on the total initial investment before income taxes.
 - (ii) The annual percent return on the total initial investment after income taxes.
 - (iii) The annual percent return on the total initial investment before income taxes based on capital recovery with minimum profit.