B. Sc FOOD TECHNOLOGY
&
QUALITY ASSURANCE

SYLLABUS RE-STRUCTURE PROPOSAL

2011

SEMESTER I, II, III, IV, V &VI

LIST OF EXPERT COMMITTEE MEMBERS
FOOD TECHNOLOGY AND QUALITY ASSURANCE

1) Smt. Beena Cherian,
   The Principal,
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   St.George's College,
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NEED AND SCOPE OF FOOD TECHNOLOGY & QUALITY ASSURANCE

In the world, India is the second largest producer of food after china; the country has achieved the potential of being the biggest with the food and agricultural sector. Indian food industry is considered to be occupying about two third of total Indian skills and equipment have taken place in industries such as canning, dairy, food processing, specialty processing, packaging, frozen food, refrigeration and thermo processing. India's food processing industry has been growing at over 13% deposit the global slow down. And now the government is aiming to double the turnover in the next five year by setting up mega food parks to attract global capital.

At present the export from agro-sector represents about 16% of total Indian exports. The primary export commodities are cereals, fruits, vegetables and their processed products, and marine products but fast growing specialty products have also penetrated in foreign markets. Considering the contribution of these products in Indian export, it is necessary to have appropriate technology for handling and processing of agricultural produce.

Food technologist develops the manufacturing process and recipes. They work on existing and newly discovered Ingredients and technologies to invent new recipes and concept. They are involved in conducting equipment and producing sample product and machinery for making products with a consistent flavor, color and texture.

- Modifying existing products and process and developing new ones (NPD).
- Checking and improving quality control procedures from raw material stage to the finished product.
- Addressing issues of safety and quality.
- Selecting raw material and other ingredients.
- Maintaining proper hygienic condition of entire food industry.

- Step undertaken to meet the requirements of with respect to hygienic and nutritional quality.

PRE-REQUISITES

Any student who has passed +2 examinations in the science stream can apply for the six semesters B. Sc Food Technology & Quality Assurance Program. It is a program offering 33 courses which are given below:

Common courses – 2
Complementary courses – 8
Core courses – 21
Choice based course – 1
Open Course -1

PURPOSE OF COURSE

The purpose of this course is to enable graduate to acquire the scientific, technical and industry through on understanding of science underlying food technology together with deeper comprehension of food quality assurance.

The expected outcomes are that students acquire and demonstrate:

- A knowledge and competence in the principles of quality assurance and quality management system as they are applied in the food manufacture and distribution to produce safe food meeting quality and legal requirements.
- An understanding of chemical, biological and physical principle which underlie food processing, package and storage.
- An ability to apply the principles of chemical analysis, microbiology and statistical control techniques to assure the quality and safety of food.
- A capacity to undertake research and NPD in the science of food.
- Critical, presentational and interpersonal skills.

BSc FOOD TECHNOLOGY AND QUALITY ASSURANCE - DETAILED SCHEME

DETAILED SCHEME OF INSTRUCTION OF THE COURSES

DETAILED SCHEME OF INSTRUCTION OF THE CORE COURSES

SEMESTER I

FQA1B101 – INTRODUCTION TO FOOD TECHNOLOGY

Credits - 3 **72 hrs**

.OBJECTIVES

- To acquire an overall concept about food technology
- to enable students to apply scientific methods independently

Unit I **12 Hrs**

Introduction to food science

Definition, history

Food science concept- Basic SI unit of length, volume and weight, temperature, relative density, pH or potential hydrogen

Physico-chemical properties of food- boiling point, evaporation, melting point, smoke point, surface tension, osmosis, humidity, freezing point and specific gravity.

Unit II **15 Hrs**

Colloidal systems in foods

constituents of food, true solution, suspension,

stability of colloidal system

Type of colloidal system in food- sol, gel, emulsion, foam

Classification of food

Health food, ethnic food, organic food, functional food, nutraceuticals, fabricated foods, convenience foods, GM foods, space foods

Unit III **15 Hrs**

Food additive and adulteration

Food additives, antioxidants, sequestrants, preservatives, nutrient supplement, emulsifiers, stabilizers and thickening agents, bleaching and maturing agent, sweeteners, humectants and anti caking agents coloring and flavoring substance

Food adulteration: Types of adulterants- intentional and incidental adulterants, methods of detection

Unit IV **20 Hrs**

Sampling and sample preparation

population and sample

Methods of sampling-simple random sampling, systematic sampling, stratified random sampling

Summary Measures – Measures of central Tendency – arithmetic mean, geometric mean, harmonic mean, median, mode

Unit V **10 Hrs**

Food safety, quality and evaluation

Food safety and quality assurance- definition

Evaluation of food- subjective and objective

Food standards - PFA, BIS, AGMARK, FPO, FAQ, ISI

Reference

- Blackburn, C. W. and McClure, P.J Food borne Pathogens Woodhead Publishing Limited Cambridge England 2005.
- Frederick,J.F. Encyclopedia of Food Science and Technology. Second edition vol 1-4, a widely interscience publication, 2000
- Goldberg, I. Functional foods, Designer foods, pharma foods and nutraceuticals. An aspen publication, gaithers burg, marylamd, 1999.

- Roday, S., food science and nutrition. Third edition, Oxford University Press, New Delhi, 2008.
- Joseph,K.X. Statistics third edition Calicut University central co-operative stores Ltd. 2004.
- Khader,V. Text book of Food science and Technology. Published by India Council of Agricultural Research, NewDelhi 110012, 2001
- Kothari, C.R, Research Methodology- Methods and Techniques, 2nd edition New age International (P) Ltd publishers, New Delhi. 2000
- Manay, N.S, Shadaksharaswamy, M., Foods- Facts and Principles, New Age International Publishers, New Delhi, 2004.
- Srilakshmi, B. Food Science (3rd edition), New Age International (P) Limited Publishers, New Delhi, 2003.
- Reddy Y.S, Newer concept and applications for food industry. Gene tech Books, New Delhi 110002, 2006

FQA1B102 – BASIC NUTRITION

Credits - 3 **72 hrs**

OBJECTIVES

- To enable the students to understand the general principles of nutrition as well as the practical aspects involved in nutritional planning and management.

Unit I **5Hrs**

Introduction to nutrition

Definition, optimum nutrition, nutritional status, good nutritional status, poor nutritional status, malnutrition, under nutrition, signs of good nutritional status, signs of poor nutritional status, definition and functions of nutrients

Unit II **10 Hrs**

Food and our body

Food and its functions, digestion, absorption and metabolism of food

Buccal digestion, gastric digestion and intestinal digestion, factors that affect digestion, absorption and metabolism

Five food groups.

Unit III **15 Hrs**

Energy metabolism

Introduction, unit of measurement, energy value of food- calorimetry or bi proximate

composition; energy needs of the body- reference man and reference woman; basal metabolic rate, factors affecting the BMR

Carbohydrates

Introduction, classification of carbohydrates, digestion, absorption and metabolism, functions, deficiency, recommended dietary intake and sources.

Role of dietary fibre in prevention and treatment of diseases

Unit IV **20 Hrs**

Proteins

Introduction, classifications of proteins, nutritional classification of amino acids protein quality - biological value, net protein utilization, protein efficiency ratio.

Function, deficiency, sources and requirements

Fat

Introduction , classification of lipids, saturated and unsaturated fatty acid, functions of fat, digestion, absorption and metabolism of fat, deficiency, food sources and RDA

Unit V **22 Hrs**

Vitamins

Classification- fat soluble and water soluble vitamins;

Fat soluble vitamins, A, D, E and K - introduction, function, deficiency, sources, RDA

Water soluble vitamins- B complex and C-introduction, functions, deficiency, sources, RDA

Minerals

major or macro minerals- General functions of minerals, deficiency, sources and RDA

Major minerals- calcium, phosphorus, sodium, potassium, iron

Minor minerals- iron and manganese

Trace elements – iodine, fluorine, zinc

Water

Introduction, functions, water, daily intake of water, daily loss of water, body water, water balance, deficiency of water, retention of water, daily requirements, fat.

REFERENCES

- Begum, R. A text book of foods, Nutrition and Dietetics. Second revised edition, Sterling Publishers (P) Ltd, New Delhi, 1991.
- Joshi, S. A Nutrition and dietetics. Third edition, Tata McGraw Hill education pvt ltd, New Delhi, 2010
- Mudambi, S. R., Rajagopal M. V., Fundamentals of food and Nutritions, 2nd edition, Wiley Eastern Ltd, New Delhi 1990.

- Roday, S., food science and nutrition. Third edition, Oxford University Press, New Delhi, 2008.
- Srilakshmi, B, Nutrition Science, New age international (P) Ltd publishers, New Delhi, 2006.
- Swaminathan, M., Hand book of Food & Nutrition, Bappco Ltd, Bangalore, 1978.
- Swaminathan, M. Essential of food and Nutrition, Vol.I. Bangalore Printing and Publishing Co. Ltd Bangalore.

FQA1B103 BASIC PRINCIPLES OF FOOD ENGINEERING

Credits - 3 **72 hrs**

OBJECTIVES

1. Students will know the basic concepts of thermodynamics, heat and mass transfer.
2. Students will be able to apply material balances and energy balances to the field of food engineering.
3. Students will be able to understand equipment used in the food industry.

Unit I **10hrs**

Engineering units

Dimensions – Primary, secondary

Engineering units- Base units, derived and supplementary units.

system – state of system, extensive properties, intensive properties.

Unit II **20hrs**

Heat transfer in food processing

systems for heating and cooling food products, plate heat exchanger, tubular heat exchanger, scraped surface heat exchanger, steam infusion heat exchanger

Thermal properties of foods- specific heat, thermal conductivity.

Modes of heat transfer – conductive heat transfer, convective heat transfer, radiation heat transfer, steady state heat transfer, heat conduction in multilayer system, estimation of convective heat transfer co-efficient, role of insulation in reducing heat loss from process equipment.

Unit III **15hrs**

Mechanical operations

Mixing-different type of mixers used in food in industry, continuously stirred mixing tanks.
Filtration- batch filtration, continues filtration, ultra filtration, reverse osmosis
Clarification and concentration process- evaporation, diffusion concentration, single and multiple stage freeze concentration, reverse osmosis.
Dehydration systems - kiln, tunnel, cabinet, drum and spray driers.

Unit IV **15hrs**

Mechanical separation- sedimentation, centrifugation, filtration, phase separation, distillation
Thermal processing of packaged foods- retort/ autoclave sterilization, UHT
radiation treatment – electron beam X-ray and gamma rays

Unit V **12hrs**

Food Freezing

Introduction
Thermodynamics of food freezing – Freezing temperature depression, Unfrozen water fraction.
Freezing and freeze drying, IQF, plate freezers, air blast freezers, fluidized bed freezer, freeze drier, cryogenic freezing

Reference

- Dincer, I. Heat Transfer Food Cooling Applications. Taylor and Francis Publishers, USA. 1997.
- Heldman, D. R. and Lund, D.B. Handbook of Food Engineering 2nd edition. CRC press, Newyork. 2007.
- Singh, R.P. Introduction to Food Engineering 3rd edition. Academic Press, London. 2004.

SEMESTER II

FQA2B201 – BIOCHEMISTRY

Credits - 4 **72 hrs**

.OBJECTIVES

- To understand the basic and applied aspects of biochemistry
- Enable the students to understand the biochemical pathways and how they are relevant to their lives

Unit I **15 Hrs**

Carbohydrates: classification , monosaccharaides, oligosaccharides, polysaccharides, structure and configuration of aldose, ketoses, triose, tetrose, pentose, hexose, starch, inulin, glycogen, cellulose, cell and biomolecules, prokaryotic and eukaryotic cells, nucleus, mitochondria, endoplasmic reticulum, Golgi apparatus, lysosomes, peroxisomes.

Unit II **15 Hrs**

Lipids: classification of lipids, fatty acids, essential fatty acids, triglycerols, phospholipids, glycolipids, lipoprotein, sterols, amphipathic lipids, digestion absorption transportation and utilization, functions source and requirement , effect of deficiency

Unit III **10 Hrs**

Proteins and amino acid: amino acid, classification, properties, essential amino acid, structure of proteins- primary, secondary, tertiary, quaternary structure of proteins; protein denaturation.

Unit IV **22 Hrs**

Enzymes: Nomenclature and classification , kinetics of enzymic reactions, types of enzymes, enzyme inhibition, reversible inhibition, irreversible inhibition, conditions affecting enzymatic reactions, co-enzymes,

Vitamins: classification, functions, requirement and deficiency conditions, vitamin A, D, E, K, Ascorbic acid, Thiamine, Riboflavin, Niacin, Pyridoxine, Folic acid, Pantothenic acid

Unit V **10 Hrs**

Metabolism of carbohydrates: glycolysis and tricarboxylic acid (TCA) cycle, HMP shunt

Metabolism of proteins: - Transamination, deamination, decarboxylation, urea cycle.

REFERENCE:

- Berg, J. M., Tymocezko, J. L, Biochemistry, Sixth edition, W H Freeman and Company, New York, 2007
- Das, D. Biochemistry, Seventh Edition, Academic publishers, calcutta, 1992
- Jain, J. L., Fundamentals of Biochemistry, Fifth Edition, S. Chand and Company Ltd, 2001
- Satyanarayana, U. and Chakrapani, U. Biochemistry, Third edition, Books and Allied Pvt ltd, Kolkata, 2006

FQA2B202 - FOOD MICROBIOLOGY

Credits - 3 **72 hrs**

.**OBJECTIVES**

- To acquire an elementary knowledge about the aspects of interaction between micro organisms, food borne illness and food fermentation

Unit I **15hrs**

Introduction to microbiology:

Microbiology in daily life, Characteristics and morphology of bacteria, fungi, virus, protozoa & algae.

Control of micro-organisms- Growth curve; Influence of environmental factors on growth- PH, Water activity, O_2 availability, Temperature, Pressure and Radiation

Unit II **15hrs**

Cultures & Media:

Different type of media- Selective media and differential media; Preparation of media- PDA media, Nutrient agar, Mac Conkey agar;

Culturing techniques- Spread plate and streak plate, pour plate.

Indicator microorganisms: Sources, methods of detection, growth & survival; significance of coliforms, faecal streptococci, enterobacteriaceae

Unit III **15 hrs**

Contamination and spoilage of different foods:

Cereals, sugar and their products, Milk & milk products, Fruits and vegetables, canned foods, Meat, fish, egg and poultry

Unit IV

Food borne illness: **12hrs**

Food intoxication- Staphylococcal intoxication, botulism

Food infection- *Salmonellosis, Clostridium perfringens, Bacillus cereus gastroenteritis, E.coli* infection and others

Unit V **15hrs**

Beneficial microorganisms:

SCP- Microorganisms used, raw materials used as substrate, condition for growth and production, nutritive value and use of SCP;
Fat from microorganisms- Microorganisms used, raw materials, production of fat; Production of amino acids;
Production or other substances added to foods.
Production of enzymes- amylases, invertase, pectolytic enzymes, proteolytic enzymes, other enzymes
Fermentation- tempeh kedele, soya sauce production, vinegar, lactic acid bacteria fermented food, Dairy based fermented foods- Kefir, yoghurt, cheese and butter;Yeast based fermented foods- bread, wine and beer

REFERENCES

- Frazier, W.C. Food Microbiology. 4th edition. Mc Graw Hill. New York, 2008
- Khetarpaul, N. Food microbiology, Daya publishing house, New Delhi, 2009
- Narayanan, L.M. and Mani,L. Microbiology.Saras Publications, Nagercoil.
- Pelzar, H.J. and Rober, D. Microbiology 5th edition Mc Graw Hill. NewYork, 2009
- Prescott, L.M., Harley, J.P. and Klein, D.A. Microbiology. 4th edition McGraw-Hill, NewYork. 1999

FQA2B203 - FOOD MICROBIOLOGY PRACTICALS

Credits - 3 **72 hrs**

.**OBJECTIVES**

- To study the basic rules and requirements of a microbiology laboratory.
- Give emphasis towards the preparation of biological stains, reagents, media and their composition.
- To get thorough different methods for staining of microorganisms.

1. Microbiology laboratory basic rules and requirements: **5 Hrs**

a. Laboratory rules- basic rules of a microbiology lab

b. Basic requirements of a microbiological lab- common glass ware; test tube, culture tube and screw capped tubes, Petri dish, pipette, Pasteur pipette, glass spreader, inoculation needle, busen burner, water bath, autoclave, laminar air flow, incubator, hot air oven, quebec colony counter, centrifuge, microscope.

c. Disposal of laboratory waste and culture.

2. Staining of microorganisms **17 Hrs**

a. Methods for detection of specific bacteria:

- wet mount preparation for motile bacteria,
- hanging drop mount method,
- Petri dish culture method for detection bacteria.

b. Methods for staining of micro organism:

- Simple staining (Monochrome staining)
- Gram staining for differentiation of bacteria
- Negative staining of bacteria
- Endospore staining

3. Composition, preparation and sterilization of media: **15 Hrs**

a. PDA media
b. Nutrient agar media
c. Mc-Conkey agar media

4. Demonstration of techniques for pure culture of microorganisms: **15 Hrs**

a. Streak plate method
b. Pour plate method
c. Serial dilution agar plate method

5. Microbiology of: **20 Hrs**

a. Milk:
   - standard plate count method,
   - enzymatic test of milk by methylene blue reductase test,
   - quality testing of milk by resazurin test,
   - determination of phosphates activity of milk,
   - detection of mastitis through milk test

b. Meat, Fish, Egg

c. Water: (MPN test)

- Presumptive test
- Confirmed test
- Completed test

REFERENCE:

- Dubey, R.C. and Maheshwari, D.K. Practical microbiology. S.Chand and Company Limited, Ramnagar. New Delhi 2002.

MODEL QUESTION PAPER

B.Sc FOOD TECHNOLOGY AND QUALITY ASSURANCE
MODEL QUESTION PAPER

FQA1B101 – INTRODUCTION TO FOOD TECHNOLOGY

Time: 3 hours ***Max Weightage: 25***

Instructions:

1. Time allotted for the examination is 3 hours.
2. Answer all questions in Part A. This contains 4 bunches of 4 objective type questions. For each bunch Grade A will be awarded if all the answers are correct, B for 3, C for 2, D for 1 and E for 0.
3. Answer any 5 questions from Part B, any 4 from Part C and any 2 from Part D.

Part A
(Objective type questions. Weightage 1 for each bunch)

Fill up the following:

1. …… is a change of state from liquid to gas which takes place continuously from the surface of a liquid
2. ……. Is a force experienced on the surface of a liquid
3. ……is a colloidal dispersion of a tiny droplet of a one liquid suspended in another.
4. The chemical name of aginomotto is …….

True or false

5. EDTA is a good example of sequestrants
6. Lecithin is an example of antioxidant
7. The dry seeds of a papaya is used as an adulterant in Black pepper
8. Calcium carbonate is used as a adulterant in common salt.

Choose the correct answer

9. Passage of solution from weak solution to strong solution
   a) Osmosis b) Diffusion
   c) Surface tension d)Relative density
10. Colloidal dispersion of solid dispersed in a liquid
   a) Gel b) sol
   c) Emulsion d) Foam
11. Name the synthetic Red color permitted by PFA
   a) Carmoisine b) tartrazine
   c) Indigo carmine d) fast green FCF

Turn over

12. The toxic factor presents in lathyrus sativus species
   a) goitrogens b) saponin
   c) cyanogenic glycosides d)β- oxalyl amino alanine

Name the following:

13. Name the flavour enhancer which is associated with Chinese Restaurant Syndrome
14. Name the artificial sweetener that leads to bladder cancer
15. The measurement is used to express the degree of acidity or alkalinity of a food
16. The adulterant used in mustard seed

(4x1 = 4)

Part B
(Short answer types questions. Weightage 1 each)

Answer any 5 out of the following

17. Define fabricated foods?
18. Differentiate between quality control and quality assurance
19. Explain the term TQM and GMP
20. What is organic food?
21. Differentiate between ISO 22000 and HACCP
22. What are GM foods
23. Define Conveniences foods?
24. What is sampling?

(5x1 = 5)

Part C

Short essay type questions. Weightage 2 each
Answer any four out of the following

25. Write a short note on FPO
26. What are flavour enhacncer name two of them
27. Describe the mandatory food laws applicable to food industry in India
28. Give an account of antinutrients and its toxicological effect
29. What are synthetic sweeteners and name the sweeteners used in food and its advantages
30. Explain median and mode and discuss their relative merits and demerits

(4x2 = 8)

Part D
(Essay type questions, weightage 4 each)

Answer any 2 from the following

31. Define food additives and list the types of food additives used in processing
32. Describe simple random and stratified sampling. State the advantages of stratified sampling as compared to simple random sampling
33. Define food adulteration and explain any five type's of food adulterants and methods used for its detection

(2x4= 8)

B.Sc FOOD TECHNOLOGY AND QUALITY ASSURANCE
MODEL QUESTION PAPER

FQA1B102 - BASIC NUTRITION

Time: 3 hours ***Max Weightage: 25***

Instructions:

3. Time allotted for the examination is 3 hours.
4. Answer all questions in Part A. This contains 4 bunches of 4 objective type questions. For each bunch Grade A will be awarded if all the answers are correct, B for 3, C for 2, D for 1 and E for 0.
3. Answer any 5 questions from Part B, any 4 from Part C and any 2 from Part D.

Part A
(Objective type questions. Weightage 1 for each bunch)

Choose the correct answer

1. Cobalt is a constituent of ……..
   a) Vit B6 b) Vit B12 c) Vit B3
   d) Vit B1

2. Which one of the vitamin A is function as a steroid hormone
   a) Retinal b) Retinol c) Provitamin A
   d) β-carotene

3. The enzyme of saliva that breaks down carbohydrate is
   a) Protease b) Amylase c) Lipase d) Oxidase

4. Pellagra is a disease caused by the deficiency of
   a) Vit A b) Vit D c) Vit B1 d) Vit B3

Fill up the following:

5. FIGLU is excreted in urine is the deficiency of vitamin…….
6. Excess intake of water results in…….
7. Biological value is used to measure the quality of ……..
8. The essential amino acids …… is converted to niacin in human body

Name the following:

9. Protein deficiency disease
10. The vitamin necessary for the synthesis of visual purple
11. The chemical name of Vit B_{12}
12. Disease caused due to insufficient insulin

True or false

13. Glucose is the sugar present in milk
14. Carbohydrates can spare protein
15. Fats are the cheapest source of energy
16. Hypokalemia is the deficiency disease of potassium

(4x1 = 4)

Part B
(Short answer types questions. Weightage 1 each)

Answer any 5 out of the following

Define/Explain

17. BMR
18. Vitamin D is a hormone justify
19. Nutrients
20. Reference man
21. Calorific value of foods
22. Net protein utilization
23. Essential amino acids
24. Malnutrition

(5x1 = 5)

Part C
Short essay type questions. Weightage 2 each
Answer any four out of the following

25. Mention the names of five food groups. In brief describe any two of these groups.
26. Describe the importance of iodine in the diet and the disease associated with its deficiency.
27. Describe a method for the determination of energy value of foods.
28. What is the role of water in human nutrition? What are the symptoms and effect of deficiency of water in human subject?
29. Describe the chemistry, biochemical function, daily requirements, sources and deficiency manifestation of vitamin B1
30. What is protein energy malnutrition. Explain the major symptoms of protein deficiency in adults.

(4x2 = 8)

Part D
(Essay type questions, weightage 4 each)

Answer any 2 from the following

31. What do you understand by anaemia. Mention the role of iron and folic acid in the alleviation of the symptoms of anaemia. Mention few good sources of iron and folic acid.
32. How do you classified minerals, chalk a plan for that? Mention the role of any two major minerals in the diet. What are the factors which affect their bioavailability
33. How are the carbohydrates classified? Also discus the assimilation process of it in our body

(2x4 = 8)

B. Sc FOOD TECHNOLOGY AND QUALITY ASSURANCE
MODEL QUESTION PAPER

FQA1B103 – BASIC PRINCIPLES OF FOOD ENGINEERING

Time: 3 hours ***Max Weightage: 25***

Instructions:

5. Time allotted for the examination is 3 hours.
6. Answer all questions in Part A. This contains 4 bunches of 4 objective type questions. For each bunch Grade A will be awarded if all the answers are correct, B for 3, C for 2, D for 1 and E for 0.
3. Answer any 5 questions from Part B, any 4 from Part C and any 2 from Part D.

Part A
(Objective type questions, Weightage 1 for each bunch)

1. Unit of luminous intensity
   a) mole b) candela
   c) Kelvin d) ampere

2. ratio between the buoyancy forces and viscous forces
   a) Reynolds number b) grashoff number
   c) prandtl number d)biot number

3. A sum of internal energy and the product of pressure and volume
   a) Pressure b) Enthalpy
   c) Temperature d) Concentration.
4. specific heat is denoted by
   a) KJ/kg◦C b) candela
   c) Kelvin d) ampere

Fill up the following

5. …… is the rate of change of velocity with time
6. In the SI system the unit of pressure is……
7. Abbreviation of SI system is……
8. In a …… system, the boundary of the system is impervious to flow mass

Name the following:

9. The process of transition of a substance from the solid phase to the gas phase without passing through an intermediate liquid phase
10. unit of irradiation
11. The heat exchanger consists of series of parallel, closely spaced stainless steel plates pressed in a frame
12. Boiling point of liquid nitrogen

True or false

13. Jasper guy woodroof is the father of food engineering
14. γ-rays have high penetration power than x-rays
15. Acceleration is the rate of change of distance with time
16. Joule per second(J/s) is the unit of power

(4x1 = 4)

Part B
(Short answer types questions. Weightage 1 each)

Answer any 5 out of the following

17. Distinguish between laminar and tubular flow
18. Differentiate between moisture content in wet basis and dry basis
19. Describe reverse osmosis

20. Define convection and explain how forced convection differ from natural convection
21. Write a short note on application of microwave heating
22. With the help of neat diagram, explain the working of rotary drum filters
23. Describe ultra filtration
24. Write short note on fluidized bed drying

(5x1 = 5)

Part C
Short essay type questions, Weightage 2 each
Answer any four out of the following

25. With a simple sketch, explain the working of a spray dryer, what type of material can be dried using a spray drier
26. Explain how steady state heat transfer differs from transient heat transfer with an example each.
27. Explain the role of insulation in reducing heat from process equipment with a suitable example
28. Explain the working principle of IQF?
29. Give a short note on different type of mixers?
30. Distinguish between batch and continuous filtration?

(4x2=8)

Part D
(Essay type questions, Weightage 4 each)

Answer any 2 from the following

31. What is freezing? Describe different phenomenon occurring during freezing of foods, with the help of time-temperature curve
32. Briefly explain the cryogenic freezing, give the application in food industry
33. Explain the different type of heat transfer, what are the factors which affect the heat transfer.

(2x4 = 8)

B.Sc FOOD TECHNOLOGY AND QUALITY ASSURANCE
MODEL QUESTION PAPER
FQA2B201 BIOCHEMISTRY

Time: 3 hours *Max Weightage: 25*

Instructions

1. Time allotted for the examination is 3 hours.
2. Answer all questions in Part A. This contains four bunches of 4 objective type questions. For each bunch Grade A will be awarded if all the answers are correct, B for 3, C for 2, D for 1 and E for 0.

3. Answer any five questions from Part B, any four from Part C and any two from Part D.

PART A

(*Objective type questions – weight 1 for each bunch of four questions*)

Choose the correct answer:

1. Vitamin B5 is also known as
   a) Niacin b) Pyridoxine
   c) Riboflavin d) Pantothenic acid

2. Lactose consists of galactose joined to glucose by **……** linkage
   a) β-1, 4- glycosidic bond b) α-1, 6- glycosidic linkage
   c) α-1,4-glycosidic linkage d) None of these

3. Lecithin is an example of
   a) Sphingophospho lipid b) Glycerophospho lipid
   c) Lipoprotein d) Glycolipid

4. Write the name of semi essential amino acid
   a) Lysine b) Methionone
   c) Arginine d) Tyrosine

Fill up the following:

5. Keratomalacia is caused due to the deficiency of **……..**
6. The complete catalytically active enzyme is called **……..**
7. The most abundant animal sterol is **…….**
8. Hexose Mono Phosphate Pathway is concerned with the Biosynthesis of **…… & ……**

Name the following:

9. The structure of α – helix was predicted by
10. The enzymes of TCA Cycle are located in
11. Anti sterility Vitamin
12. Krebs – Hanseleit cycle is also known as

True or False:

13. Unsaturated fatty acids exhibit geometrical isomerism.
14. Dextrin is the breakdown products of starch by the enzyme amylase
15. Denatured proteins can be crystallized

16. The enzymes of TCA cycle are located in mitochondrial matrix

(4x1=4)

PART B

Short answer type questions, weight 1 for each.
Answer any five out of the following.

Define/ Explain:

17. Heteropolysaccharide.
18. Co-enzymes
19. Essential amino acids
20. Keratin
21. Mutarotation
22. Waxes
23. Amphipathic lipids
24. Cristae

(5x1 = 5)

PART C

Short essay type questions,weight 2 for each.
Answer any four out of the following.

25. Biochemical functions of vitamin C
26. Hypervitaminosis A and its symptoms
27. List out the amino acids and name the sulphur containing amino acid
28. Briefly explain cholesterol and give its structure
29. Explain deamination
30. Vitamin D is a hormone justify

(4x2 = 8)

PART D

Essay type questions, weight 4 for each.
Answer any two from the following

31. Describe briefly the metabolism of glucose 6 phosphate
32. Describe the chemistry biochemical functions, daily requirements sources and deficiency manifestation of folic acid
33. Mention few important functions of proteins. How do you classify various amino acids based on their structure? What are the symptoms of protein deficiency

(2x4=8)

B. Sc FOOD TECHNOLOGY AND QUALITY ASSURANCE
MODEL QUESTION PAPER

FQA2B202 – FOOD MICROBIOLOGY

Time: 3 hours ***Max Weightage: 25***

Instructions:

7. Time allotted for the examination is 3 hours.
8. Answer all questions in Part A. This contains 4 bunches of 4 objective type questions. For each bunch Grade A will be awarded if all the answers are correct, B for 3, C for 2, D for 1 and E for 0.
3. Answer any 5 questions from Part B, any 4 from Part C and any 2 from Part D.

Part A
(Objective type questions, Weightage 1 for each bunch)

Name the following:

1*) Candida utilis* is otherwise called
2) The selective agent in Mac Conkey medium
3) Example of a fruiting body
4) Which virus contain both N and H spikes

Choose the correct answer

5) Secondary metabolites produced in ……..phase
A) Lag phase c) log phase
b) Stationary phase d) decline phase
6) Vinegar is produced by……
a) penicillium c) aspergillus's
b) acetobacter d) mucor
7)Stuart's medium is an example of …….media
a) Indicator media c) transport media
b) Selective media d) enrichment media
8) French dry sherry is made from ……
a) Cashew c) apple
b) Grapes d) cherry

Fill up the following:

9) Bullet shaped virus is …….
10) Exponential phase is also known as……..
11) The predominant species of spoilage of fish at chilling temperature is …….
12)…….reaction is a useful test for the rapid detection of clostridium perfringens in clinical specimen

Turn Over

True or false

13) Conidiospore is a sexual spore
14) Herpes virus is an enveloped virus
15) Rhizopus delemar helps in the production of amylase
16) In hard swell bulged ends of can cannot be pressed back to the normal position

(4x1 = 4)

Part B
(Short answer types questions. Weightage 1 each)

Answer any 5 out of the following

Define/Explain

17) LAB
18) Mycotoxin
19) Water activity
20) Difference between slime layer and capsule
21) Swiss cheese
22) Asepsis
23) Invertase
24) Botulism

(5x1 = 5)

Part C
Short essay type questions, Weightage 2 each
Answer any four out of the following

25) Explain growth curve?
26) How do we produce vinegar?
27) Difference between infection and intoxication?
28) Methods for isolating pure cultures?
29) Importance of yeast in fermentation?
30) Spoilage of canned food?

Part D
(Essay type questions, Weightage 4 each)

Answer any 2 from the following

31) Which are the microorganisms used in the production of SCP? Explain the nutritive value and use of SCP?
32) Different types of containers used in canning and its importance? Explain the types of spoilage occurring in canned foods?

33) Virulence factors of *E –coli* and explain main types of clinical syndromes caused by E-*coli*

(2x4 = 8)

BSc FOOD TECHNOLOGY AND QUALITY ASSURANCE PROGRAMME

MODEL QUESTION PAPER

FQA2B203 FOOD MICROBIOLOGY PRACTICALS 2011

Max weightage: 25

Time: 3 hrs

CERTIFIED RECORD -WEIGHTAGE 4

1) Identify and characterize the given bacterial culture by GRAM STAINING. Show the slide to the examiner?
   a) principle- weightage 2
   b) method- weightage 4
   c) result - weightage 2

2) Perform ENDOSPORE STAINING OR NEGATIVE STAINING?

   a) method- weightage2
   b) result- weightage1

3) Answer the following.(weightage 2 each)

   a) Differentiate between gram positive and gram negative staining procedure?
   b) What is the principle and use of Auto clave?
   c) Write down the procedure of pour plate method for pure culture?
   d) What is the principle of Hanging drop mount method?
   e) Write down the microbiological significance of specimen NO: 1 to5?