

No. of Printed Pages : 4

MFN-008

00292

MASTER OF SCIENCE (DIETETICS AND FOOD SERVICE MANAGEMENT)

Term-End Examination

December, 2011

MFN-008 : PRINCIPLES OF FOOD SCIENCE

Time : 2½ hours

Maximum Marks : 75

Note : Answer four questions in all. Question No.1 is compulsory.

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1. (a) Fill in the blanks : 10
- (i) _____ is the name of the substance which cannot be digested in small intestine.
- (ii) Enzymes are termed as _____ because they increase the rate of chemical reactions within living cells without themselves suffering an overall change.
- (iii) _____ refers to degree of excellence and includes things such as taste appearance and nutritional content.
- (iv) A substance that imparts colour to fruits and vegetable is termed as _____ .

- (v) _____ process consists of separation of bran and germ from endosperm and reduction of endosperm to fine flow.
- (vi) Semolina is made from endosperm cells of hard durum _____.
- (vii) _____ is a polysaccharide present in fruits which is used as gelling agent.
- (viii) Development of any off or disagreeable flavours in oil or fat due to enzymatic or oxidative reaction is termed as _____.
- (ix) Flavour is a combination of _____ and _____.
- (x) _____ is the process which involves the loss of liquid from gels upon standing.

(b) Define the following : 5

- (i) Food science (ii) Hydrocolloids
(iii) Shelf - life (iv) Blanching
(v) Minimally Processed Foods.

2. (a) Explain the principle of drying. What are the factors that affect the rate of drying ? 7
- (b) Difference between roller of spray drying. 8
- (c) Enlist a few applications of microwave heating. 5

3. (a) Write a brief note on fermented foods used in India. 8
- (b) What are the functions of moulds in the fermentation of foods ? 7
- (c) What is cryogenic freezing ? List its advantages.. 5
4. (a) Define Product development. List the factors influencing product development. 8
- (b) What is a trained sensory panel ? Name the three ways in which consumer testing can be done. 7
- (c) What are functional food ? Explain giving examples and listing the health benefits of functional food. 5
-
5. (a) Define texture and name instruments used to assess the texture of different foods by objective means. 7
- (b) How are foams formed ? What are the factors affecting foam formation ? 8
- (c) What is the effect of processing on chlorophyll pigment present in vegetables ? 5

6. Differentiate between (*any four*) the following giving appropriate examples. **5+5+5+5=20**

- (a) Solar drying V/S Mechanical dehydrator
- (b) Maillard reaction V/S Caramelization
- (c) sols V/S gels.
- (d) Water soluble V/S fat soluble vitamins.
- (e) Protein isolates and protein hydrolysates.

7. Write short notes on : (*any 4*) **5+5+5+5=20**

- (a) Concentration as a food processing technique.
- (b) Thermal processing of food.
- (c) Modified starches.
- (d) Properties of colloidal systems.
- (e) Minerals.

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No. of Printed Pages : 3

MFN-008

00553

MASTER OF SCIENCE (DIETETICS AND FOOD SERVICE MANAGEMENT)

Term-End Examination

June, 2012

MFN-008 : PRINCIPLES OF FOOD SCIENCE

Time : 2½ hours

Maximum Marks : 75

Note : Answer four questions in all. Question No.1 is compulsory.

1. (a) Differentiate between the following sets of terms : 2x5=10
- (i) Agar and Alginates
 - (ii) Colloids and crystalloids
 - (iii) Canning and freezing
 - (iv) Amylose and Amylopectin
 - (v) Protein Hydrolysates and protein concentrates
- (b) Give one word for each of the following : 1x5=5
- (i) An additive that promotes formation of a stable mixture or emulsion of oil and water.
 - (ii) Loss of Liquid from gels upon standing and shrinkage of gel structure.

- (iii) Development of any off or disagreeable flavour in oil / fat due to enzymatic or oxidative reaction.
- (iv) A method of food preservation that involves soaking the food in a strong salt solution.
- (v) Simplest form of carbohydrates which cannot be hydrolyzed further into smaller units.

2. (a) Describe the deteriorative changes that occur in fats and oils. 10
- (b) Discuss briefly the role of emulsifier in achieving a stable product. 10
3. (a) What are acceptance tests ? Describe how these tests can be used for evaluation of food products ? 10
- (b) Mention the changes that occur in fruits and vegetables during the process of dehydration, freezing and pickling. 10
4. (a) Explain how the process of drying helps in preserving food ? Discuss different methods of drying. 12
- (b) Discuss the role of fermentation in food preservation ? Give examples of fermented foods. 8

5. (a) Differentiate between Sols, Gels and suspensions. 8
- (b) Briefly discuss different phases of developing a new product. 12
6. (a) What are the changes that take place during baking of cereals ? 5
- (b) Explain the principle behind dough formation. 5
- (c) Explain the role of vitamins in Food Industry with the help of examples. 10
7. Write short notes on *any four* of the following :
- (a) Natural Pigments 5+5+5+5
- (b) Antioxidants
- (c) Irradiation
- (d) Non - Nutritive sweetness
- (e) Enzymes in Baking Industry
- (f) Processing methods.

No. of Printed Pages : 4

MFN-008

02169

MASTER OF SCIENCE (DIETETICS AND FOOD SERVICE MANAGEMENT)

Term-End Examination

December, 2012

MFN-008 : PRINCIPLES OF FOOD SCIENCE

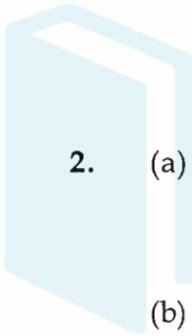
Time : 2½ hours

Maximum Marks : 75

Note : Answer four questions in all. Question No. 1 is compulsory.

1. (a) Explain what happens when : 2x5=10
- (i) Spinach is boiled in water
 - (ii) Eggs get spoiled
 - (iii) Browning takes place on the surface of cut fruit
 - (iv) Egg white is whipped
 - (v) Starch solution is cooked
- (b) State *true* or *false* : 1x5=5
- (i) Smoking is a method of food preservation mainly used for milk and milk products.
 - (ii) The process of loss of liquids from gels causing their shrinkage is called Gelation.

- (iii) A chemical preservative is a substance when added to dough of flour and water causes it to rise by evolving CO_2 and other gases.
- (iv) Blanching is a mild heat treatment applied to plant parts prior to freezing drying or canning.
- (v) Fortified food is a food that has a component incorporated into it to give a specific medical physiological benefit, other than a purely nutritional benefit.

- 
2. (a) What is a single cell protein ? Discuss advantages of selecting micro organisms as a source of proteins. 10
- (b) What is Rheology of foods ? What are the different textural parameters observed in foods ? 10
3. (a) Describe various properties of colloidal systems. 8
- (b) What is food spoilage ? Describe the causes of food deterioration / spoilage. 6
- (c) What are non - starch polysaccharides and how are they important in food industry ? 6

4. Differentiate between *any four* of the following : $5 \times 4 = 20$
- (a) Natural gums and modified gums
 - (b) Enzymatic browning and non - enzymatic browning
 - (c) Cryogenic freezing and air blast freezing
 - (d) Sols and suspensions
 - (e) Taste interaction and Taste threshold
 - (f) Natural preservatives and chemical preservatives.
5. (a) Describe various methods of preserving meat, fish and poultry products. 10
- (b) Briefly discuss the food application of gums in food industry. 5
- (c) Explain the principle behind dough formation. 5
6. (a) Explain how the process of drying helps in preservation of food. Also discuss different methods of drying 12
- (b) Discuss the role of fermentation in food preservation by giving examples of fermented food. 8

7. Write short notes on *any four* of the following : 5x4=20
- (a) Protein Isolates
 - (b) Need for product development
 - (c) Lipid oxidation
 - (d) Importance of Iron and Calcium in food
 - (e) Shelf life of foods
 - (f) Modified starches
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No. of Printed Pages : 2

MFN-008

MASTER OF SCIENCE (DIETETICS AND FOOD SERVICE MANAGEMENT)

02461

Term-End Examination

June, 2013

MFN-008 : PRINCIPLES OF FOOD SCIENCE

Time : 2½ hours

Maximum Marks : 75

Note : Attempt any five questions. All questions equal marks.

1. Define the following terms with examples (any 5) : 5x3=15
- (a) Autoxidation
 - (b) Functional Foods
 - (c) Protein Isolates
 - (d) Sensory Evaluation
 - (e) Irradiation
 - (f) Hydrocolloids
 - (g) Texture
2. What do you know about different types of food fermentation ? Enlist some fermented foods consumed in India. 15

3. (a) Explain the barrier concept in the context of preservation. 7½
(b) How can the undesirable changes occurring in fried foods be minimized? 7½
4. (a) Briefly explain any one functional property of proteins. 7
(b) What is atmospheric dehydration? Enlist the different dryers used in the food industry. 8
5. (a) What is pasteurization? Explain the different methods of pasteurization? 2+6
(b) Describe the principles of food preservation. 7
6. (a) Enumerate the functions of colour in foods. 5
(b) Describe the alterations occurring in the following foods during processing: 5+5
(i) Fruits and Vegetables
(ii) Meat and meat products
7. Differentiate between **any 3** of the following with suitable examples. 5+5+5
(a) Colloids and Crystalloids
(b) Foams and Emulsions
(c) Monomeric and Oligomeric enzymes
(d) Sterilization and Canning
(e) Maillard Reaction and Caramalization
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No. of Printed Pages : 2

MFN-008

00014

MASTER OF SCIENCE (DIETETICS AND FOOD SERVICE MANAGEMENT)

Term-End Examination

December, 2013

MFN-008 : PRINCIPLES OF FOOD SCIENCE

Time : 2½ hours

Maximum Marks : 75

Note : Attempt any five questions. All questions carry equal marks.

1. Differentiate between the following sets of terms. 3+3+3+3+3
 - (a) Suspension and sols
 - (b) Starches and modified starches
 - (c) Concentration and dehydration
 - (d) Solar drying and mechanical drying
 - (e) Foods fermented by moulds and Foods fermented by bacteria.

2. (a) Explain the mechanism of drying. 2+8
Enumerate the various types of drying methods.

- (b) Explain how the process of freezing helps 5
in the preservation of food.

3. (a) What is autoxidation ? How can the autoxidation be prevented in fats and oils ? 2+6
(b) What are the important functional properties of sugars ? 7
4. (a) What are protein hydrolysates ? Give any two applications of Whey Protein Concentrates (WPC) and Soya Protein Isolates. 7½
(b) Define Bio availability. Explain the effect of food processing on the nutrient content of foods. 7½
5. (a) What are foams ? What factors influence their stability ? 7
(b) Explain the physical and chemical changes that take place during the storage processing of meat and poultry. 8
6. What are functional foods ? What are the physiological benefits associated with the consumption of these active compounds ? Explain with the help of examples. 15
7. Write short notes on *any three* of the following :
(a) Traditional methods of food processing 5+5+5
(b) Freezing Technology
(c) Rheology of foods
(d) Functional role of minerals in foods
(e) Use of food additives in the food industry
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01765

No. of Printed Pages : 3

MFN-008

**MASTER OF SCIENCE DIETETICS AND FOOD
SCIENCE MANAGEMENT M.SC-(DFSM)**

Term-End Examination

June, 2014

MFN-008 : PRINCIPLES OF FOOD SCIENCE

Time : 2½ hours

Maximum Marks : 75

*Note : Question no.1 is compulsory. Attempt five questions.
All questions carry equal marks.*

1. Explain the role of the following in 2-3 sentences $1\frac{1}{2} \times 10$
each: =15
- (a) Sugars in Baking of Cakes.
 - (b) Modified starches in food and Confectionary industry.
 - (c) Gluten in Dough formation
 - (d) Salt in food preservation
 - (e) Conditioning in process of milling of grains.
 - (f) Anti foaming agents in food industry
 - (g) Blanching in food Processing.
 - (h) Use of invert sugar as a sweetner
 - (i) Food application at 'guar gum'
 - (j) Hydration properties of proteins

2. (a) What is food spoilage? List the major causes of food deterioration. 2+5=7
- (b) What is single cell protein? Discuss some advantages of selecting micro-organism as source of protein. 2+6=8
3. (a) What is rancidity? List the factors influencing lipid oxidation. 7
- (b) What are colloids? Explain briefly the properties of colloids. 2+6=8
4. (a) Describe the Principles of dehydration. 3
- (b) List factors that affect drying rate and drying time. Briefly describe the drying techniques. 12
-
5. (a) Explain briefly the steps involved in product development 8
- (b) Enumerate any two important emerging areas in food science and technology. 7
6. (a) Describe the post harvest handling of food. 8
- (b) What are the preliminary steps involved during preparation of raw materials. 7

7 Write short notes on **any 3** of the following: **5+5+5=15**

- (a) Pasteurisation
- (b) Sols and gels
- (c) Class I and class II preservatives.
- (d) Canning of Vegetables.
- (e) Hedonic Test and paired comparison test.



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No. of Printed Pages : 2

MFN-008

MASTER OF SCIENCE (DIETETICS AND FOOD SERVICE MANAGEMENT)

Term-End Examination

December, 2014

MFN-008 : PRINCIPLES OF FOOD SCIENCE

Time : 2½ hours

Maximum Marks : 75

Note : Question No. 1 is compulsory. Attempt five questions in all. All questions carry equal marks.

1. Explain briefly the following in 2-3 sentences each : 1½x10=15
- (a) Steps involved in product development
 - (b) Functional foods
 - (c) Rheology of foods
 - (d) Canning process
 - (e) Foam formation in foods
 - (f) Modified starches in confectionary industry
 - (g) Enzymes in Brewing industry
 - (h) Whey protein concentrates
 - (i) Food irradiation
 - (j) Commercial sterilization
2. (a) Explain how the process of freezing helps in preservation of food ? What are different methods of freezing ? 3+7=10
- (b) What are the factors that influence microwave heating pattern ? 5

3. (a) Enumerate different textural parameters and describe any two tests for measuring texture in foods. 8
(b) What are the changes that occur during baking of cereals and cooking of eggs? $3.5+3.5=7$
4. (a) What are food hydro-colloids? Describe their application in food industry. 8
(b) What are Hedonic test for sensory evaluation of foods? 3
(c) List some natural food colourants obtained from microbial, animal and plant sources. 4
5. (a) Give the functional and nutritional role of any four essential minerals in food industry. 8
(b) List the factors affecting the process of deep fat frying. 3
(c) What are food emulsions? How can they be stabilized? 4
6. (a) What are the deteriorative actions and useful effects of enzymes in food processing operations? 8
(b) What are the preliminary steps involved during preparation of raw materials? 7
7. Write short notes on **any three** of the following :
(a) Chemical and microbial changes in food spoilage $5+5+5=15$
(b) Changes in proteins in dough formation
(c) Dehydration of foods
(d) Enzymatic and non-enzymatic browning
(e) Processing of cereals for milling
(f) Single cell protein
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No. of Printed Pages : 3

MFN-008

MASTER OF SCIENCE (DIETETICS AND FOOD SERVICE MANAGEMENT)

Term-End Examination

June, 2015

MFN-008 : PRINCIPLES OF FOOD SCIENCE

Time : 2½ hours

Maximum Marks : 75

Note : (i) *Question No. 1 is compulsory.*
(ii) *Attempt four questions in all.*

1. (a) List any two important emerging areas in food science and technology. 2
- (b) Give one example each of the commonly occurring monosaccharide, disaccharide and polysaccharide in foods. 1½
- (c) Give one example each of natural gums and synthetic gums used in the food industry. 1
- (d) Give one application each of Vitamin A and Vitamin B₆ in the food industry. 1
- (e) Name the enzyme(s) used in
(i) Baking of bread, and 2
(ii) cheese production.
- (f) What is tyndall effect ? 2½
- (g) Name the instrument that can be used to measure the texture of doughs and batters in a food industry. 1

- (h) Indicate the areas in the mouth where various taste sensations are perceived. 2
- (i) Give reason why browning occurs in heated milk. 2
2. (a) 'Two major types of non-enzymatic browning reactions have been recognised to occur in foods during processing'. Explain briefly giving suitable examples. 12
- (b) Give the application of the following in the food industry : 4+4
- Pectin
 - Starch
3. (a) Explain the oxidative changes occurring in fats and oils causing deterioration. 8
- (b) Enumerate the commonly used antioxidants which can prevent oxidation of fats and oils. 4
- (c) List the functional properties of proteins and discuss any one in detail. 8
4. (a) Differentiate between Foams and Emulsions, giving examples and highlighting their properties. 10
- (b) Briefly explain the methods and principle of home based food preservation commonly used today. 10

5. Explain the following briefly : 5+5+5+5

- (a) Why the green vegetables change colour on cooking ?
- (b) Process of browning in canned fish.
- (c) Thermal conditions required to produce commercial sterility.
- (d) Techniques/methods used for drying / dehydration of foods.

6. Write short notes on **any four** of the following :

- (a) Advantages of microwave heating over conventional heating. 5+5+5+5
 - (b) Uses of foods fermented by bacteria.
 - (c) Use of acidulants and chemicals as preservatives.
 - (d) Minimally processed foods
 - (e) Sensory evaluation of new food products.
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No. of Printed Pages : 3

MFN-008

**MASTER OF SCIENCE (DIETETICS AND FOOD
SERVICE MANAGEMENT)**

Term-End Examination

December, 2015

MFN-008 : PRINCIPLES OF FOOD SCIENCE

Time : 2½ hours

Maximum Marks : 75

Note : (i) *Question No. 1 is compulsory.*

(ii) *Attempt four questions in all.*

1. (a) Explain the following in 2-3 lines only. 10

(i) Caramelization

(ii) Reversion flavour

(iii) Pickling

(iv) Single Cell Proteins (SCP)

(v) Turnover Rate of Oil.

(b) Give one food application for each of the following : 5

(i) Curdlan

(ii) Xanthan Gum

(iii) Starches

(iv) Phosphates

(v) Rennin/Chymosin

2. (a) Briefly describe the functional role of sugars in the food industry giving suitable examples. 8
- (b) What is invert sugar ? Give an example. Explain its uses in food industry. 5
- (c) Elaborate on the functional use of non starch polysaccharides in the food industry. Give appropriate examples. 7

3. Explain the following briefly : 5+5+5+5

- (a) How antioxidants delay the onset of rancidity ?
- (b) Hydration property of proteins.
- (c) Protein isolates and concentrates giving examples.
- (d) Enzymatic analysis in foods and its uses in food industry.

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4. (a) Classify the colloidal system. Give examples. 6
- (b) Keeping food processing in mind mention the alteration occurring in : 3+3
- Meat and meat products
 - Milk and milk products
- (c) Enlist the different methods of thermal processing. Explain any one in details. 2+6

5. (a) Define functional food. Explain the benefits of consuming functional foods giving appropriate examples. 10
- (b) "Moulds and Yeasts play an important role in food fermentation". Justify the statement highlighting the preparations and their uses. 10
6. Write short notes on **any four** of the following :
- (a) Freezing systems used in food industry. ⁵⁺⁵⁺⁵⁺⁵
- (b) Preservation by concentration
- (c) Canning : Uses in food industry.
- (d) Functions of colour in foods.
- (e) Steps involved in preliminary preparation of raw materials

No. of Printed Pages : 3

MFN-008

02743

MASTER OF SCIENCE (DIETETICS AND FOOD SERVICE MANAGEMENT)

Term-End Examination

June, 2016

MFN-008 : PRINCIPLES OF FOOD SCIENCE

Time : 2½ hours

Maximum Marks : 75

- Note :*
- (i) *Question No. 1 is compulsory.*
 - (ii) *Attempt five questions in all.*
 - (iii) *All questions carry equal marks.*

-
1. (a) Fill in the blanks : 10
- (i) Reaction between amino group of protein and reducing group of sugar at a high temperature is known as _____ reaction.
 - (ii) The science of deformation and flow of matter is known as _____.
 - (iii) Proteins from sources like algae, fungi, bacteria and yeast are _____.
 - (iv) The chief pigment present in green vegetables is _____.
 - (v) Mayonnaise is an example of _____ in _____ emulsion
 - (vi) Substances that can delay the onset or slow the rate of oxidative deterioration of oil/fats are _____.

- (vii) When sensory organs are used to assess the quality of food product the evaluation is said to be _____.
- (viii) Loss of liquids from gels upon standing and shrinkage of gel structure is known as _____.
- (ix) The major component of film formed on heating of milk is _____.
- (x) Sugar, salt and spices belong to _____ preservatives and are considered relatively safe for consumption.

(b) State True or False and correct the false statements : 5

- (i) Flavour is combination of both taste and smell.
- (ii) Chlorophyll enhances to dark green colour when food is heated in acidic solution.
- (iii) Eggs lose their heat coagulation properties on drying.
- (iv) Water activity is the ratio of vapour pressure of a food to the vapour pressure of pure water.
- (v) Caramelization is formation of dark coloured complexes when sugars are heated at high temperature.

2. (a) Differentiate between colloids and crystalloids. Describe properties of colloidal system. 3+7
- (b) What are the various factors affecting the process of deep fat frying? 5

3. (a) How does the dough formation takes place ? Describe the factors affecting the protein-protein interaction during dough formation. 7
- (b) What is the affect of heat processing on milk and Eggs ? 4+4=8
4. (a) Mention any two applications of whey protein concentrates and say protein concentrates. 7
- (b) Give the functional and nutritional role of essential minerals in food industry. 8
5. (a) What are the various methods of concentration being used in food processing ? 10
- (b) Enlist five fermented foods consumed in India. 5
6. Enumerate various causes of food spoilage. 5+10
Discuss briefly the principles and methods of food preservation.
-
7. Differentiate between any five : 5x3=15
- (a) Blanching and Pasteurization
- (b) Drying and Concentration
- (c) Emulsions and Foams
- (d) Sieving and Winnowing
- (e) Sensory evaluation and Objective evaluation
- (f) Protein Isolates and Protein hydrolysate
- (g) Enzymatic and non-enzymatic browning

No. of Printed Pages : 3

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MFN-008 : PRINCIPLES OF FOOD SCIENCE

Time : 2½ hours

Maximum Marks : 75

- Note :** (i) *Question No. 1 is compulsory.*
(ii) *Attempt five questions in all.*
(iii) *All questions carry equal marks.*

1. (a) Give **one** word for the following : 10
- (i) Modification of starch structure by physical and chemical means to attain a particular functional property.
 - (ii) An additive that promotes formation of a stable mixture or emulsion of oil and water.
 - (iii) Loss of liquid from gel upon standing and shrinkage of gel structure.
 - (iv) Resistance to flow of liquids.
 - (v) The pH of a solution in which a protein has no net charge and does not migrate in an electric field.
 - (vi) A process of preserving foods by sealing and heat processing in an air tight vacuum container.
 - (vii) Development of any off or disagreeable flavour in oil/fat due to enzymatic or oxidative reaction.

- (viii) A fast and a cheap method of freezing in which liquified gases at an atmosphere below -60°C are placed in direct contact with the foods.
- (ix) The process where seeds sprout and begin to grow.
- (x) Ratio of vapour pressure of food to vapour pressure of pure water.
- (b) Explain briefly the following : $2\frac{1}{2}\times 2=5$
- (i) Classification of types of water found in food
- (ii) Sensory Evaluation of food
2. (a) What are food emulsions ? Give examples of various food emulsions and how are these stabilized ? 10
- (b) Explain briefly the principles of food preservation. 5
3. (a) Describe the process of starch gelatinization and retrogradation. 7
- (b) List various functions of starches and their applications in food industry. 8
-
4. (a) What do you understand by the term Pasteurization ? Also explain the types of Pasteurisation. 7
- (b) How is the harvesting maturity identified ? List the main steps involved during post-harvest handling of fresh produce. 4+4
5. (a) What is the role of Acceptance testing in sensory evaluation ? State different types of Acceptance tests. 8
- (b) What is product development ? List the need and factors influencing product development. 7

6. (a) Enumerate the functions of colours in foods. 5
(b) Describe the use of enzymes in : $2\frac{1}{2} \times 4 = 10$
- Baking of bread
 - Brewing
 - Clarification of fruit juices and wines
 - Cheese production
7. Explain briefly any five of the following : $5 \times 3 = 15$
- (a) Process of gelation in eggs.
 - (b) Softening and hardening of Legumes during cooking.
 - (c) Cooked flavour in milk on heating and other changes.
 - (d) Formation of emulsion in preparation of mayonnaise.
 - (e) Increased shelf life of dried vegetables.
 - (f) Use of whey protein concentrates in preparation of ice cream, processed cheese, sauces and salad dressings.
 - (g) Conditioning of wheat prior to process of milling.

No. of Printed Pages : 3

MFN-008

MASTER OF SCIENCE (DIETETICS AND FOOD SERVICE MANAGEMENT)

Term-End Examination

June, 2017

MFN-008 : PRINCIPLES OF FOOD SCIENCE

Time : 2½ hours

Maximum Marks : 75

- Note :*
- (i) *Question No. 1 is compulsory.*
 - (ii) *Attempt five questions in all.*
 - (iii) *All questions carry equal marks.*

-
1. (a) Give one example each of the components of the following. Sugars, Starch and Non-Starch polysaccharide, found in our diet. 3
- (b) Mention the compound responsible for rancidity of fats and name the compound liberated by hypolysis. 2
- (c) What is a single cell protein ? 2
- (d) Name any two readily oxidable compounds which are protected by Vitamin E. 2
- (e) Name any two nutritional functional role of phosphate in the food industry. 2
- (f) Name any one natural food colour obtained from the following : 3
- (i) Microbial Source
 - (ii) Animal Source
 - (iii) Plant Source
- (g) Name the effect caused due to autoclaving milk. 1

2. Explain the applications of the following in the food industry. Give appropriate examples. 5+5+5
- (a) Starches
 - (b) Pectin
 - (c) Guar Gum
3. (a) What is autoxidation ? Present a schematic illustration summarizing the process of lipid oxidation. 3+7
- (b) Briefly explain the maillard reaction and its significance. 5
4. (a) Comment on the following functional properties of protein and its uses in food preparation : 4+4
- (i) Texturization
 - (ii) Protein - protein interaction
- (b) Describe the application of enzymatic analysis in food industry giving appropriate examples. 7
5. Define Sols, Gels, Foams and emulsions. How are they formed ? What are the factors affecting their stability ? Elaborate. 15
6. Explain briefly the following alterations in food : 3+3+3+3+3
- (a) Green vegetables become olive green on cooking.
 - (b) Cooked flavour appearing on heating milk.
 - (c) Browning occurring in fruits and vegetables.
 - (d) Reversion flavour in oils
 - (e) Maillard reaction in eggs.

7. Briefly describe some of the common traditional methods and principles of preservation used at home and in a small scale industry. 15
8. Write short notes on **any five** of the following 50 - 100 words each only. 3+3+3+3+3
- (a) Canning and advantages of canned foods
 - (b) Simple techniques used for evaporation during the concentration process
 - (c) Fermentation as a food processing method
 - (d) Food applications of microwave
 - (e) Common preservatives in food products
 - (f) Sensory Evaluation of food products



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No. of Printed Pages : 3

MFN-008

03053

MASTER OF SCIENCE (DIETETICS AND FOOD SERVICE MANAGEMENT)

Term-End Examination

December, 2017

MFN-008 : PRINCIPLES OF FOOD SCIENCE

Time : 2½ hours

Maximum Marks : 75

- Note :** (i) Question No. 1 is compulsory.
(ii) Attempt five questions in all.
(iii) All questions carry equal marks.

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1. (a) Name any two emerging areas in the area of Food Science and Technology. 2
- (b) List any four products made from modified starch. 2
- (c) Give any four functions of gums in the food industry. 2
- (d) What are the compounds formed during thermal decomposition of fats and oil ? 2
- (e) Name the two proteins in flour which cross-link to form gluten. 2
- (f) Name the enzymes used in the following : 3
- (i) Baking of bread
- (ii) Brewing
- (iii) Cheese production
- (g) List any two uses of food additives in the food industry. 2

2. (a) Briefly explain the role of sugars in the following : 7+8
- (i) Process of fermentation
 - (ii) In appearance of food
3. Discuss the food applications of the following in the food industry : 5+5+5
- (i) Pectin
 - (ii) Cellulose
 - (iii) Gum Arabic
4. (a) Enumerate the factors that influence deep fat frying at home. 7
- (b) Briefly explain the surface properties of proteins giving appropriate examples. 8
5. (a) "Colloidal systems exhibit certain unique characteristics". Elaborate on these characteristics. 8
- (b) What do you understand by the term food rheology ? Name a few instruments that are used to measure texture of foods. 4+3
6. "Food processing can result in several advantages and certain alterations which may change the appearance, colour, texture of food". Justify the statement highlighting the advantages and alteration commonly seen in different foods. 15

7. Explain briefly any five of the following : **3x5=15**
- (a) Foods fermented by bacteria
 - (b) Post harvest system of cereal processing
 - (c) Minimally processed fresh foods
 - (d) Hedonic scale : A useful acceptance test
 - (e) Functional foods used in new product development
 - (f) Use of commercial sterilization in food preservation
 - (g) Applications of vitamins in food industry



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No. of Printed Pages : 3

MFN-008

**MASTER OF SCIENCE (DIETETICS AND
FOOD SERVICE MANAGEMENT)**

Term-End Examination

01835

June, 2018

MFN-008 : PRINCIPLES OF FOOD SCIENCE

Time : $2\frac{1}{2}$ hours

Maximum Marks : 75

Note : Question no. 1 is **compulsory**. Attempt **five** questions in all. All questions carry equal marks.

1. (a) Define "Food Science" and "Food Technology". $2\frac{1}{2}$
- (b) List any two common monosaccharides and two common polysaccharides found in foods. 2
- (c) What do you understand by the term "Weeping" in the context of application of sugars in the food industry? Give example. 2
- (d) What are modified starches? Give examples. 2
- (e) List the main difference between vegetable oils and animal fats. $2\frac{1}{2}$
- (f) What is a single cell protein? 1

- (g) Mention any one application of the following in the food industry : 3
- (i) Vitamin A (dry form)
 - (ii) Nicotinic acid
 - (iii) Sodium
2. Discuss the role of sugars in :
- (a) Formation of egg foam 2
 - (b) Preparation of dough and batters 2
 - (c) Fermentation 3
 - (d) Non-enzymatic browning reaction 8
3. Give the examples and applications of the following in the food industry : 5+5+5
- (a) Algae polysaccharide
 - (b) Microbial polysaccharide
 - (c) Protein concentrates
4. (a) Briefly describe the deteriorative changes occurring in fats and oils. 10
- (b) Give the role of enzymes in brewing industry and in cheese production. $2\frac{1}{2} + 2\frac{1}{2}$
5. (a) Differentiate between sols and gels, highlighting their application in the food industry. 7

- (b) Explain the following briefly : 4+4
- (i) Why do green vegetables become olive green on cooking ?
 - (ii) Heating milk to high temperatures causes a cooked flavour to appear.
6. (a) Briefly discuss the application of concentration as a preservative method in food industry. Give appropriate examples. 7
- (b) What is thermal processing ? List the different methods used for thermal processing. Briefly explain the application of any one method in the food industry. 2+2+4
7. Write short notes on any *three* of the following : 5+5+5
- (a) Foods Fermented by Bacteria
 - (b) "Hurdle or Barrier Concept" of Food Preservation
 - (c) Functional Foods
 - (d) Minimally Processed Fresh Foods
 - (e) Techniques for Sensory Evaluation of Products
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No. of Printed Pages : 3

MFN-008

**MASTER OF SCIENCE (DIETETICS AND
FOOD SERVICE MANAGEMENT) (M.Sc. DFSM)**

Term-End Examination

03152

December, 2018

MFN-008 : PRINCIPLES OF FOOD SCIENCE

Time : $2\frac{1}{2}$ hours

Maximum Marks : 75

Note : Question no. 1 is compulsory. Attempt five questions in all. All questions carry equal marks.

1. (a) Give one application for each of the following in the food industry : 5
- (i) Modified starches
 - (ii) Pectin
 - (iii) Carboxymethyl Cellulose (CMC)
 - (iv) Agar
 - (v) Gum Arabic
- (b) What is invert sugar ? Give one example. $2\frac{1}{2}$
- (c) Mention any two areas/components which you are likely to study as part of food science and technology course. 2

- (d) List any four chemical preservatives safe for use in the food industry. 2
- (e) List any five common fermented foods used in India. $2\frac{1}{2}$
- (f) Give the formula used to calculate the moisture content of food. 1

2. Differentiate between the following giving appropriate examples : 5+5+5

- (a) Solar drying and Freeze drying
- (b) Maillard reaction and Caramelization
- (c) Protein isolate and Protein hydrolysate

3. (a) How can the undesirable changes occurring in fried foods be minimized ? $7\frac{1}{2}$

- (b) Briefly explain any one functional property of proteins. $7\frac{1}{2}$

4. (a) Briefly describe the principles of food preservation. 7

- (b) Describe the methods you would use for preserving meat, fish and poultry products. 8

5. (a) "Enzymes play an important role in the baking and brewing industry." Comment on the statement using appropriate justifications. 4+4
- (b) Describe the uses of foams and emulsions in the food industry. 7
6. (a) Define product development. List the factors influencing product development. 2+5
- (b) What are functional foods ? Explain giving examples and listing the health benefits of functional foods. 3+5
7. Write short notes on any *three* of the following : 5+5+5
- (a) Properties of Colloidal Systems
- (b) Instruments Used to Assess the Texture of Various Foods
- (c) Cryogenic Freezing : Concept and Advantages
- (d) Applications of Microwave Heating
- (e) Primary Processing of Rice

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No. of Printed Pages : 4

MFN-008

**MASTER OF SCIENCE (DIETETICS
AND FOOD SERVICE MANAGEMENT)**

M. SC. (DFSM)

Term-End Examination

June, 2019

MFN-008 : PRINCIPLES OF FOOD SCIENCE

Time : 2 $\frac{1}{2}$ Hours

Maximum Marks : 75

Note : Answer four questions in all. Q. No. 1 is compulsory.

1. Give one food application for each of the following : 15

- (i) Acidulant
- (ii) Emulsifier
- (iii) Single Cell Protein (SCP)
- (iv) Sugar
- (v) Pectin
- (vi) Nicotinic acid
- (vii) Modified Starch
- (viii) Protein
- (ix) Phosphates

[2]

MFN-008

- (x) Chymosin
- (xi) Caramalization
- (xii) Foams
- (xiii) Satting
- (xiv) Seed gums
- (xv) Gluten

2. (a) What is non-enzymatic browning ?
Describe the browning reactions occurring
in food during processing. 10

(b) Illustrate the starch structure and describe
its properties and functions which are in
use in the food industry. 10

3. Explain the following briefly, giving examples :

5+5+5+5

- (i) Algal polysaccharides
- (ii) Use of food additives in food industry
- (iii) Surface properties of proteins
- (iv) Application of enzymatic analysis in food
industry

4. Briefly describe the following with appropriate
examples : 5+5+5+5

(a) 12 D concept in the context of food
sterilization

(A-26)

[3]

MFN-008

- (b) Freezing as a preservative method
 - (c) Minimally processed foods
 - (d) Drying processes for food dehydration
5. (a) What do you understand by the concept of thermal decomposition of fats and oils ? Present a critical review on this concept. 7
- (b) What are the alterations occurring in cereals and legumes during processing and storage ? Explain giving examples. 7
- (c) Mention the alterations occurring in the following during food processing : 3+3
- (i) Milk and milk products
 - (ii) Meat and meat products
6. (a) Define the following terms and briefly explain the relationship between them : 2+2+2+4
- (i) Product development
 - (ii) Functional foods
 - (iii) Sensory evaluation
- (b) What is fermentation ? Briefly discuss the role of microorganisms in food production and preservation giving suitable examples.

10

(A-26) P. T. O.

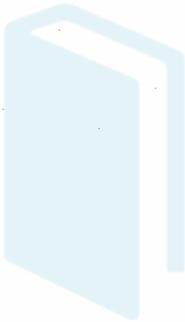
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MFN-008

7. Write short notes on any *four* of the following :

5+5+5+5

- (i) Classification of foods on the basis of pH
- (ii) Use of food colours in the food industry
- (iii) Concentration as a method of food preservation
- (iv) Properties of colloidal systems
- (v) Invert sugar and its uses in food industry



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MFN-008

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No. of Printed Pages : 3

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MFN-008

**MASTER OF SCIENCE (DIETETICS AND FOOD
SERVICE MANAGEMENT)**

Term-End Examination,

December 2019

MFN-008 : PRINCIPLES OF FOOD SCIENCE

Time : 2½ Hours

[Maximum Marks : 75

Note : (i) Attempt four questions in all.

(ii) Question No. 1 is compulsory.

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- | | | | |
|----|----|--|---|
| 1. | a) | What is Blanching? List one use of Blanching. | 2 |
| | b) | What is Gluten? How is it formed? | 3 |
| | c) | Why do Green vegetables become olive green on cooking? | 2 |
| | d) | Give one example each of protein isolate and protein concentrate. | 2 |
| | e) | Name the protein obtained from microbial source. | 1 |
| | f) | Name the building blocks of Starch. | 2 |
| | g) | Name any two Food colours permitted in food industry. | 2 |
| | h) | Give one Food application of curdlan. | 1 |
| 2. | a) | Explain the Hydration properties of proteins and its role in food preparation. | 4 |

(2)

b) Differentiate between starches and modified starches, highlighting their role in the Food industry. 10

c) What do you understand by the autoxidation of lipids? 6

3. a) Define the following and briefly explain their application in the food industry giving suitable examples. 3+3+3+3

i) Emulsions

ii) Sols

iii) Gels

iv) Foams

b) Discuss the various applications of enzymes and enzyme analysis in the food industry. 8

4. a) Briefly explain the application of the following in the food industry. 7+7

i) Water soluble vitamins

ii) Minerals

b) What are microbial polysaccharides? Give their uses in the food industry. 6

5. a) What do you understand by thermal processing of Food? List the different methods and describe the use of any two methods in details. 2+3+5+5

b) Enlist the different methods of Freezing in food processing operations. 5

(3)

6. a) What is consumer oriented product development?
Explain giving suitable examples. 10
- * b) Explain sensory evaluation, giving the methods you
would adopt and the relevance for sensory
evaluation. 10

7. Write short notes on **any four** of the following :
5+5+5+5

- a) Steps involved in preliminary preparation of raw
material.
- b) How antioxidants delay the onset of rancidity?
- c) Role of moulds in food fermentation.
- d) Functional properties of sugars.
- e) Alterations occurring in eggs during processing.



No. of Printed Pages : 4

MFN-008

**MASTER OF SCIENCE (DIETETICS
AND FOOD SERVICE MANGEMENT)**

M. Sc. (DFSM)

Term-End Examination

June, 2020

MFN-088 : PRINCIPLES OF FOOD SCIENCE

Time : 2½ Hours

Maximum Marks : 75

Note : Answer four questions in all. Question No. 1

is compulsory.

1. (a) Define Food Science and Food Technology.

2+2

(b) Name the major dietary carbohydrates found in food along with their examples. 3

(c) What is the brown pigment formed during caramelization called ? 1

P. T. O.

[2]

MFN-008

- (d) What is invert sugar ? Give one use of invert sugar. 2+1
- (e) Name any *two* products containing modified starches. 2
- (f) What are microbial polysaccharides ? Give *two* examples. 2
2. (a) Briefly discuss the basic properties of starches and their application in the food industry. 10
-
- (b) What are non-starch polysaccharides (NSP) ? Elaborate on the different NSPs and their uses in the food industry. 10
3. Explain the following (in about 250 words) : 5 each
- (a) Oxidative changes occurring in fats and oils.

[3]

MFN-008

- (b) Single cell proteins (SCP) and their advantages and disadvantages as a source of protein.
- (c) Application of Vitamin B complex in the food industry.
- (d) Functional role of minerals.
4. (a) Present a brief review on the utilization of enzymes in the food industry, giving appropriate examples. 10
- (b) Comment on the natural colours in the food and their novel sources with appropriate examples. 10
5. (a) What are the different types of emulsions ? Explain with the help of examples. 5
- (b) Differentiate between sols, gels and suspensions. 5
- (c) What are the factors that influence sensitivity of taste ? Explain in about 250 words. 5

[4]

MFN-008

- (d) Why is the study of food texture important ? Highlight the different textural parameters. 5
6. (a) Briefly discuss the alternations occurring in the following during processing : 5+5
- (i) Milk and milk products
 - (ii) Eggs
- (b) Describe briefly the thermal processing methods used today in the food industry. 10
7. Write short notes on any *four* of the following : 5 each
- (a) Foods fermented by bacteria
 - (b) Different methods available for freezing foods
 - (c) Preparation of raw material for processing- the steps involved.
 - (d) Sensory evaluation of a new product.
 - (e) Traditional methods of food processing.

No. of Printed Pages : 4

MFN-008

**MASTER OF SCIENCE (DIETETICS
AND FOOD SERVICE MANAGEMENT)**

M. SC. (DFSM)

Term-End Examination

December, 2020

MFN-008 : PRINCIPLES OF FOOD SCIENCE

Time : $2\frac{1}{2}$ Hours *Maximum Marks : 75*

*Note : Answer **four** questions in all. Question number 1 is compulsory.*

1. (a) List any **two** emerging trends in the area
of Food Science/Technology. 2

(b) Give one food application of the following :

4

(i) Agar

(ii) Locus bean gum

(iii) Gum arabic

(iv) Curdlan

(c) Enlist the different types of fatty acids giving examples of the foods they are found in. 3

- (d) What is whey protein concentrate ? Enlist its uses. 2
- (e) Name the dispersed phase, dispersing medium and examples of the following colloidal systems : 4
- (i) Fog
 - (ii) Foam
 - (iii) Sol
 - (iv) Emulsion
2. (a) List the *two* main non-enzymatic browning reactions occurring in food during processing. Discuss the role of sugars in these reactions. 10
- (b) List the compounds formed during the following processes in fats and oils. Explain how can you prevent these changes : 10
- (i) Oxidation
 - (ii) Thermal decomposition
3. (a) Comment on the functional properties of proteins and their role in food preparation. 10
- (b) Briefly discuss how enzyme assay is helpful in determining the extent of freshness in wheat grains, milk and meat, giving examples. 10

4. Explain the following briefly : 5 each
- (a) Green vegetables become olive green on cooking.
 - (b) Heating milk to high temperatures causes a cooked flavour to appear.
 - (c) Undesirable colour changes in canned fish.
 - (d) The development of brown colour in egg white during drying as well as storage after drying.
5. (a) Briefly explain the different functions of moulds in food fermentation. 6
- (b) Enumerate the simple techniques one can use during concentration process. Give examples of food products formed by concentration process. 6
- (c) How are foods dehydrated ? Give the principle and any *two* methods one can use for dehydration. 8
6. (a) What are minimally processed foods ? Enlist their advantages. 5
- (b) Define product development. Briefly analyze the role of functional foods in product development, giving appropriate examples. 10

[4]

MFN-008

(c) What is shelf-life ? What are the methods of shelf-life examination ? 5

7. Write short notes on any *four* of the following :
5 each

(a) Use of salt, sugar as a preservative

(b) Freezing of food by contact with a cooled gas

(c) Food applications of microwave

(d) Uses of food additives with appropriate examples

(e) Sterilization as a food preservation method



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