

**SECOND SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, APRIL 2021**

(CBCSS)

Food Science and Technology

FST 2C 08—FOOD ENGINEERING

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend all questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Part A

*Answer any four out of 7 questions.
Each question carries 2 weightage.*

1. Write down Ostwald de walele equation for non-newtonian fluid with parameters explained.
2. If moisture content of a material is 50% on wet basis, what is the moisture content (%) on dry basis.
3. Name the 3 energy heads in Bernoulli equation.
4. Name any 3 size measuring techniques.
5. Define Fick's law
6. Describe drying rate Vs moisture content with a diagram.
7. What is the main advantage of pneumatic conveyor against belt conveyor ?

(4 × 2 = 8 weightage)

Part B

*Write a short essay on any four of the following.
Each question carries 3 weightage.*

1. What are the different types of forces responsible for size reduction of a material. Name any 4 different grinding equipment.
2. Describe a homogenizer and its application in food processing.

Turn over

3. Classify pumps into 2 main categories. Brief on each.
4. Write advantages of soxhlet extractor compared to batch extractor.
5. What are the advantages and disadvantages of supercritical fluid extraction.
6. Describe crystallization process and what are the factors that lead to a pure crystal product.
7. What is the main difference between fluidized bed dryer and spouted bed dryer ?

(4 × 3 = 12 weightage)

Part C

Write essay on any two the following.

Each question carries 5 weightage.

1. Write a brief note on applications of high pressure technology in food processing.
2. Describe evaporation process for mango pulp concentrate with a diagram of a single effect evaporator and its components.
3. Describe the functioning of freeze drying process with a neat diagram. What are its advantages/ disadvantages compared with other drying processes ?
4. Describe steady and unsteady heat transfer with equations for rate of heat transfer. How can you improve the heat transfer coefficient.

(2 × 5 = 10 weightage)

**SECOND SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
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(CBCSS)

Food Science and Technology

FST 2C 07—INDUSTRIAL MICROBIOLOGY AND BIOCHEMICAL ENGINEERING

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend all questions in each section.*
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Part A

Write short note on four out of seven of the following.

Each question carries 2 weightage.

1. How are biochemical reactions different from chemical reaction ?
2. Write short note on COD.
3. Write short note on cell disruption.
4. Write short note on gene cloning.
5. Mention the use of pectinases and proteases.
6. What are methods for sterilization ?
7. Type of impellers used in fermenters.

(4 × 2 = 8 weightage)

Part B

Answer any four questions.

Each question carries 3 weightage.

1. Discuss the industrial production and use of organic acids.
2. Explain the Monod's kinetic model for bacterial growth.

Turn over

3. Explain the brewing of beer.
4. What is meant by solid state fermentation ? What are the advantages and disadvantages.
5. Methods for the preservation of industrially important micro-organisms ?
6. What are the considerations in scale-up of bioprocesses ?
7. Describe the growth-associated and non-growth-associated product formation in fermentation process.

(4 × 3 = 12 weightage)

Part C

Write essay on any **two** of the following.
Each question carries 5 weightage.

1. Write short notes on any *two* :
 - a) Adsorption.
 - b) Membrane processing in product recovery.
 - c) Aqueous two phase extraction.
 - d) Drying.
2. Discuss the condition required for growth and production of amino acids and SCP and write a note on its nutritive value.
3. Discuss with neat sketch the bioreactors available for growth of microbial, plant and animal cultures.
4. Discuss the various technologies available for effluent treatment and reuse in the biotech industry.

(2 × 5 = 10 weightage)

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Food Science and Technology

FST 2C 06—FOOD STORAGE AND INFESTATION CONTROL

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Part A

Answer any four of the following questions.

Each question carries 2 weightage.

1. What precautions should be taken while storing food grains ?
2. Grain protectants.
3. Give the names of a pest each of : (i) Hymenoptera ; (ii) Causing damage in adult stage in Lepidoptera.
4. What makes an insect a pest ?
5. How food grains are stored ?
6. What is rodent control ?
7. What are the signs of infestation of stored grains ?

(4 × 2 = 8 weightage)

Turn over

Part B

Answer any **four** of the following questions.

Each question carries 3 weightage.

8. Briefly describe the two main types of metamorphosis in insects.
9. Enlist the signs of rodent infestation.
10. Describe the effect of molds on stored grains.
11. How do insects get into stored grain ?
12. What is the benefit of organic food ?
13. How do fumigants work ?
14. What bacteria cause food spoilage ? Name 4 species.

(4 × 3 = 12 weightage)

Part C

Answer any **two** of the following questions.

Each question carries 5 weightage

15. Explain methods of detecting hidden infestation.
16. Elaborate the storage structures used by farmers.
17. Briefly distinguish between pest control and pest management.
18. What are Insect Growth Regulators (IGRs)? How do they work ?

(2 × 5 = 10 weightage)

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FST 2C 05—BIOCHEMISTRY AND NUTRITION

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Part A

*Answer any **four** questions.*

Each question carries 2 weightage.

1. Write the subunit structure of ribosomes and its biological functions.
2. Name various protein and carbohydrate digestive enzymes in the GI tract.
3. Write the sources and functions of vitamin E.
4. Discuss briefly on classification of minerals.
5. Differentiate between ribonucleoside and deoxyribonucleoside.
6. Classify the vitamins based on their solubility.
7. Write on the transamination reactions of amino acids.

(4 × 2 = 8 weightage)

Part B

*Answer any **four** questions.*

Each question carries 3 weightage.

1. Write the RDA of protein, carbohydrate and fat for athletes.
2. Write a note on vitamin C deficiency on : (i) Wound healing ; and (ii) Teeth condition.

Turn over

3. What are the limiting essential amino acids in cereals? How do you improve the protein quality of cereal diet?
4. (a) Name various nutrition programs in India.
(b) Write briefly on Mid-day meal program for School children.
5. Write briefly on marasmus.
6. Draw the labeled diagram of bomb calorimeter. Give the calorific values of major nutrients.
7. (a) Name various diseases caused due to vitamin A deficiency.
(b) Give short note on night blindness.

(4 × 3 = 12 weightage)

Part C

*Answer any **two** questions.*

Each question carries 5 weightage.

1. Discuss on enzyme classification.
2. Discuss briefly on : (i) Iron deficiency anemia in different age groups ; and (ii) Its treatment ; and (iii) Dietary sources.
3. Write on specific dynamic action of foods.
4. Discuss on β -oxidation of fatty acids.

(2 × 5 = 10 weightage)