

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

**MGU-UGP (HONOURS)
FIFTH SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)
COURSE CODE: MG5DSCFTQ300
COURSE TITLE: FOOD ANALYSIS**

Duration: 1.5 hrs

Maximum Marks: 50

Part A
Short answer
Answer any 5 questions
Each question carries 2 Marks

1. Comment on importance of moisture assay [R] [CO1]
2. Define Reducing Sugar [U] [CO2]
3. Give the principle for Gerber method. [An][CO3]
4. Enlist advantages of Kjeldahl method. [R][CO3]
5. Define specific gravity. [R] [CO1]
6. What is the significance of Ash analysis? [U] [CO1]
7. Add a note on lactometer. [A][CO1]

(5×2 = 10 mark)

Part B
Short essay type questions
Answer any 5 questions
Each question carries 4 Marks

8. Give brief note on hydrometry. Discuss about different types of hydrometers [R] [CO1]
9. Write any two methods of estimating NaCl content of salted butter along with its principles. [An] [CO3]
10. Describe dry ashing method [U] [CO2]
11. Explain chemical method of moisture determination. [U] [CO1]
12. Write a note on Englyst-Cummings method. [A] [CO2]
13. Differentiate between Biuret & Lowry method for protein analysis. [R] [CO2]

14. Explain Soxhlet method with a neat diagram. [An] [CO3]

(5×4= 20 marks)

Part C

Long essay type questions

Answer any 2 questions

Each question carries 10 Marks

15. Discuss about Dry ashing and Wet ashing methods. [U] [CO1]

16. Explain Kjeldahl method for protein estimation with its advantages and disadvantages. [A][CO2]

17. Elaborate Karl-Fischer titration for moisture assay. [R] [CO1]

18. What are reducing sugars? Explain Somogyi - Nelson Method for reducing sugar estimation. [A][CO2]

(2×10= 20 marks)

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FIFTH SEMESTER EXAMINATION

(2024 ADMISSION ONWARDS)

COURSE CODE: MG5DSCFTQ301

COURSE TITLE: TECHNOLOGY OF MEAT FISH AND POULTRY PRODUCTS

Duration: 1.5 hrs

Maximum Marks: 50

Part A

Short answer

Answer any 5 questions

Each question carries 2 Marks

1. List the major proteins present in muscle. [K] [CO1]
2. Describe the significance of pH decline in post-mortem muscle. [U] [CO1]
3. What is smoking of meat? [K] [CO2]
4. List any two types of packaging used for meat products. [K] [CO2]
5. Suggest a suitable storage method for fresh poultry to maintain its quality. [A] [CO3]
6. Assess the importance of the eggshell. [E] [CO5]
7. What is isinglass? [K] [CO4]

(5×2 = 10 marks)

Part B

Short essay type questions

Answer any 5 questions

Each question carries 4 Marks

8. Describe the various methods of meat tenderization [U] [CO1]

- 9.State the different forms of myoglobin responsible for meat colour.[K] [CO1]
- 10.Explain the formation of PSE and DFD meat and their effects on meat quality. [U] [CO2]
- 11.Explain the composition and nutritive value of poultry meat. [U] [CO3]
- 12.Describe the process of egg formation. [K] [CO 5]
- 13.Describe wet curing and dry curing of meat. [K] [CO2]
- 14.Describe the preparation and uses of fish oil and fish meat. [K] [CO4]
- (5×4= 20 marks)

Part C

Long essay type questions

Answer any 2 questions

Each question carries 10 Marks

- 15.Describe the typical layout and important features of a modern abattoir. .[K] [CO1]
- 16.Explain the various preservation and processing methods used for meat and discuss their role in maintaining meat quality and extending shelf life.[U] [CO2]
- 17.Explain the major steps involved in poultry processing and their importance in maintaining product quality.[U] [CO3]
- 18.Explain how fish by-products can be converted into value-added products and discuss their nutritional and commercial importance.[U] [CO4]
- (2×10= 20 marks)

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FIFTH SEMESTER EXAMINATION

(2024 ADMISSION ONWARDS)

COURSE CODE: MG5DSEFTQ300

COURSE TITLE: CEREAL TECHNOLOGY

Duration:2hrs

Maximum Marks: 70

Part A

Short answer

Answer any 10 questions

Each question carries 2 Marks

1. Outline the structure of rice. [R] [CO 1]
2. Describe about popping[U] [CO 4]
3. Write about flaked cereals [A] [CO 5]
4. Draw the structure of wheat [R] [CO 1]
5. List the components of rice [R] [CO 1]
6. Write about wet milling [A] [CO 4]
7. List the steps in parboiling. [R] [CO 1]
8. Mention two disadvantages of dry milling [E] [CO 4]
9. Define the term milling in rice processing. [R] [CO 1]
10. Discuss about nutritive value of corn. [U] [CO 4]
11. Write about rice flaxes? [A] [CO 1]
12. Discuss about the nutritive properties of corn. [U] [CO 4]

(10x2=20 marks)

Part B

Short Essay Type Questions

Answer any 6questions

Each question carries 5 Marks

13. Discuss about any two methods used for producing granular cereal products. [R] [CO 2]

14. Define breakfast cereals and enumerate their major categories. Give suitable examples. [U] [CO 2]
15. Discuss the processing method of Spaghetti [U] [CO 1]
16. List the important quality characteristics of RTE cereal products. [R] [CO 5]
17. Briefly describe the steps in downstream processing of enzymes. [U] [CO 5]
18. List the advantages and disadvantages of parboiling. [R] [CO 1]
19. Write detailed notes on milling of wheat [A] [CO 1]
20. Explain the role of starch gelatinization in the popping of popcorn. [U] [CO 4]

(6x5=30 marks)

Part C

Long Essay Type Questions

Answer any 2 questions

Each question carries 10 Marks

21. Explain the complete processing sequence involved in the production of flaked RTE cereals. [R] [CO 5]
22. Explain production of whole wheat flour, maida and semolina in the food industry and describe downstream processing steps. [R] [CO 1]
23. Describe in detail the processing of popcorn from selection of kernels to the final popped product. Explain the important factors that should be controlled at each stage. [A] [CO 4]
24. Explain Parboiling - traditional and modern method. [R] [CO 1]

(2x10=20 marks)

MAHATMA GANDHI UNIVERSITY, KOTTAYAM
MGU-UGP (HONOURS)
FIFTH SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)
COURSE CODE: MG5DSEFTQ301
COURSE TITLE: TECHNOLOGY OF BEVERAGES

Duration: 2 hours

Maximum Marks: 70

PART A

Short Answer Questions

Answer any **10** questions

Each question carries **2** marks

1. Note down the reactions occurring in the barrels during ageing of rum. [K] [CO4]
2. Define brandy. [U][CO4]
3. Comment on fobbing. [An][CO1]
4. Add a note on steeped coffee. [K] [CO3]
5. Comment on ale beer. [K][CO4]
6. Comment on the biological process in the treatment of tap water. [U][CO2]
7. Add a note on triglyceride process. [K][CO3]
8. Define isotonic beverage. [U][CO1]
9. Difference between black tea and green tea. [K][CO3]
10. What is demineralized water? [U][CO2]
11. Different types of wines. [An][CO4]
12. Write on decaffeination. [U][CO3]

(10×2 =20 marks)

PART B

Short Essay Questions

Answer any **6** questions

Each question carries **5** marks

13. Briefly explain the manufacturing process of sparkling wine. [An] [CO4]
14. Write a short note on fermentation of tea. [K] [CO3]
15. Describe the processing steps in CTC tea. [K] [CO3]
16. Write a note on carbonation and principles of filling technology. [U] [CO1]
17. Explain brewing process of beer. [K] [CO4]
18. Different types of beer. [K][CO4]
19. Explain different types of coffee. [K] [CO3]
20. Describe secondary treatment of water. [U] [CO2]

(6×5 =30 marks)

PART C

Long Essay Questions

Answer any **2** questions

Each question carries **10** marks

21. Explain the main components of soft drinks and its functions. [K] [CO1]
22. Describe the processing of coffee. [U] [CO3]
23. Explain the manufacturing of wine. [K] [CO4]
24. Make a detailed note on water treatment process. [An] [CO2]

(2×10=20 marks)

**MAHATMA GANDHI UNIVERSITY,
KOTTAYAM MGU-UGP (HONOURS)
FIFTH SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)
COURSE CODE: MG5DSEFTQ302**

COURSE TITLE: SENSORY EVALUATION

Duration: 2 hours

Maximum Marks: 70

Part A

Short Answer Questions

Answer any 10 questions

Each question carries 2 marks

1. Define sensory evaluation and mention one of its applications. [U/CO1]
2. List any two sensory attributes of food. [U/CO1]
3. Distinguish between subjective and objective evaluation. [U/CO1]
4. What is retro-nasal smell? [U/CO1]
5. Mention any two requirements of a sensory laboratory. [U/CO2]
6. What is meant by a trained sensory panel? [U/CO2]
7. What is a triangle test? [U/CO3]
8. Define hedonic scale. [U/CO3]
9. What is adaptation error in sensory evaluation? [U/CO3]
10. Define mouthfeel with one example. [U/CO4]
11. What is color blindness? Why is it important in sensory evaluation? [U/CO5]
12. Name any two instrumental methods used for colour measurement. [U/CO5]

[2 × 10 = 20]

Part B

Short Essay Questions

Answer any 6

questions.

Each question carries 5 marks.

1. Explain the mechanism of taste perception and describe the basic taste sensations. [U/CO1]
2. Explain the role of smell and retro-nasal olfaction in flavour perception. [U/CO1]
3. Describe the important requirements for designing a sensory evaluation laboratory. [U/CO2]
4. Explain the criteria for recruitment, selection and training of sensory panel members. [A/CO2]
5. Describe the procedure and applications of any two of the following sensory tests:
 - i. Difference test

- ii. Triangle test
 - iii. Duo-trio test
 - iv. Paired comparison test [An/CO3]
6. Explain descriptive sensory tests with reference to texture profile and flavour profile. [An/CO3]
 7. Discuss any five factors that can affect sensory measurements, including psychological and physiological factors. [E/CO5]
 8. Explain the different types of food texture and discuss the importance of texture in food acceptability. [E/CO4]

[6 × 5 = 30]

Part C
Long Essay Questions
Answer any 2
questions.
Each question carries 10 marks.

1. Explain the different types of sensory tests used in food evaluation. Discuss in detail:
 - a. Difference tests [An/CO3]
 - b. Triangle test
 - c. Duo-trio test
 - d. Paired comparison test
 - e. Descriptive tests
 - f. Affective tests
2. Explain the factors affecting sensory evaluation of food products. Discuss psychological factors such as expectation error, mutual suggestion and distraction error, and physiological factors such as adaptation, mixture interactions, enhancement, synergy and suppression. [E/CO3]
3. Describe food texture and its evaluation in detail. Explain visual, auditory, oral tactile and hand tactile texture, and discuss texture profile analysis with suitable examples. [E/CO4]
4. Explain colour and appearance evaluation of food products. Discuss normal human colour vision, colour attributes, turbidity, glossiness and translucency, and describe instrumental colour measurement methods such as Munsell colour system, tristimulus colorimetry [E/CO5]

[2x10=20]

MAHATMA GANDHI UNIVERSITY, KOTTAYAM
MGU-UGP (HONOURS)
FIFTH SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)
COURSE CODE: MG5DSEFTQ303
COURSE TITLE: TECHNOLOGY OF SPICES

Duration: 2hrs
70

Maximum Marks:

PART A

Answer any 10 questions.

Each question carries 2 marks.

1. Define spices and state their primary functions in food processing. [U] [CO1]
2. Differentiate between spice essential oils and spice oleoresins. [U] [CO1]
3. What are the key quality attributes responsible for the pungency of chilli? [K] [CO2, CO3]
4. Name the active principle responsible for the pungent flavour in black pepper and ginger. [K] [CO2, CO3]
5. Define threshing and explain its purpose in post-harvest processing of spices. [U] [CO5]
6. What is the active colouring component present in saffron, and how is it processed? [K] [CO2, CO3]
7. Mention the major storage pests that affect stored spices and their primary control measures. [K] [CO4]
8. List two post-harvest processing methods used for the bark of cinnamon. [U] [CO5]
9. What is ethylene oxide treatment, and why is it used in spice processing? [U] [CO4]
10. State the importance of drying in cardamom processing. [U] [CO2, CO3]
11. Define decontamination in relation to spice hygiene. [R] [CO4]
12. What are the primary uses of garlic and onion oleoresins in the food industry? [A] [CO1, CO3]

(10 × 2 = 20 Marks)

PART B

Answer any 6 questions.

Each question carries 5 marks.

13. Describe the manufacturing process and technology involved in the extraction of spice oleoresins. [U] [CO1]
14. Explain the post-harvest operations such as harvesting, cleaning, drying and packaging for seed spices such as coriander and cumin. [A] [CO5]
15. Discuss the classification and detailed processing steps involved in black pepper and white pepper production. [An] [CO2, CO3]

16. Write a note on the processing, grading and quality parameters of cardamom. [U] [CO2, CO3]
17. Explain the role of post-processing treatments such as steam sterilization and irradiation in spice preservation. [An] [CO4]
18. Detail the methods used for drying chillies and the factors that influence their final colour and pungency retention. [U] [CO2, CO3]
19. Discuss the pest control methods and decontamination techniques used during long-term storage of spices. [A] [CO4]
20. Write concise notes on the processing and industrial applications of:
 - (a) Nutmeg and Mace
 - (b) Cloves
 [U] [CO2, CO3]

(6 × 5 = 30 Marks)

PART C

Answer any 2 questions.

Each question carries 10 marks.

21. (a) Explain the chemical composition, harvesting and post-harvest technology of rhizome and root spices with special reference to ginger and turmeric.
(b) Discuss the steps involved in processing cured ginger and polished turmeric. [U] [CO2, CO3, CO5]
22. Describe in detail the various drying methods used for spices, including **sun drying, solar drying and mechanical drying**. Compare their effects on flavour, colour and volatile oil retention. [E] [CO4]
23. (a) Discuss the processing steps, active constituents and commercial uses of minor spices including **vanilla, tamarind, mint and asafoetida**.
(b) Explain how packaging materials protect spices from moisture sorption and aroma loss during storage. [A] [CO2, CO3, CO5]
24. Explain the advanced post-processing treatments used for spice decontamination with reference to **ethylene oxide, propylene oxide, irradiation and steam sterilization**. [An] [CO4]

(2 × 10 = 20 Marks)

MAHATMA GANDHI UNIVERSITY, KOTTAYAM
MGU-UGP (HONOURS)
FIFTH SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)
COURSE CODE: MG5DSEFTQ304
COURSE TITLE: POST HARVEST TECHNOLOGY

Duration: 2 hrs

Maximum Marks: 70

Part A

Short Answer Type Questions

Answer **10** Questions

Each question carries **2** marks

1. Discuss about postharvest management and state its importance in fruits and vegetables. [C] [1]
2. Explain the major causes of postharvest losses in fruits and vegetables. [U] [1]
3. Classify pathological disorders of fruits and vegetables and give two examples. [U] [1]
4. List the general steps involved in the processing of fruits and vegetables.[An] [1]
5. Explain the role of plant growth regulators in extending the postharvest life of crops[U][1]
6. Identify two pre-harvest factors that influence the postharvest life of fruits and vegetables. [U] [1]
7. Explain Pulsed Electric Field (PEF) processing and state one food-processing application.[E] [2]
8. Compare ohmic heating and microwave heating. [U] [2]
9. Explain microfiltration and ultrafiltration and identify one application of each in food processing. [U][4]
10. Discuss the principle of supercritical fluid extraction (SCFE) and identify one commonly used supercritical fluid. [U] [3]
11. Explain nanotechnology and identify two applications of nanoparticles in food processing. [U] [5]
12. Compare between nanoemulsions and nanocomposites with respect to their food-processing applications. [U] [5]

[2 X 10 = 20]

Part B

Short Essay Type Questions

Answer **6** Questions

Each question carries **5** marks

13. Explain the importance and scope of postharvest management of fruits and vegetables and describe its role in reducing postharvest losses. [U] [1]
14. Classify the pathological disorders of fruits and vegetables and describe their symptoms and suitable control measures. [U] [1]
15. Describe the general steps involved in fruit and vegetable processing and explain the importance of each major processing operation. [U] [1]
16. Analyse the major pre-harvest factors influencing the postharvest life of fruits and vegetables and explain the role of plant growth regulators in maintaining quality. [An] [1]
17. Explain the principles of Pulsed Electric Field (PEF) and Moderate Electric Field (MEF) processing and discuss their applications in food processing. [U] [2]
18. Compare ohmic, infrared, microwave and inductive heating with respect to their principles, advantages and applications in food processing.[U] [2]
19. Explain the principles and applications of microfiltration, ultrafiltration, nanofiltration and reverse osmosis in the food industry. [U] [4]
20. Discuss the concept of nanotechnology in food processing and explain the significance and applications of nanoparticles, nanocomposites, nanoemulsions, nanostructured materials and nanosensors. [U] [5]

[6 X 5 = 30]

Part C

Long Essay Type Questions

Answer **2** Questions

Each question carries **10** marks

21. Analyse the importance and scope of postharvest management of fruits and vegetables. Discuss the major causes of postharvest losses, pathological disorders and their symptoms.[An] [1]

22. Explain the principles of advanced electromagnetic and electric-field-based food processing technologies. Compare PEF, MEF, ohmic heating, infrared heating, microwave heating and inductive heating with respect to their working principles, advantages and limitations.[U] [2]
23. Compare microfiltration, ultrafiltration, nanofiltration and reverse osmosis based on their principles, membrane characteristics, equipment and industrial applications. [U] [4]
24. Discuss supercritical fluid extraction with reference to its principle, types and properties of supercritical fluids, methods of extraction, equipment, applications, advantages and limitations.[U] [3]

[2 X 10 =20]

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FIFTH SEMESTER EXAMINATION

(2024 ADMISSION ONWARDS)

COURSE CODE: MG5DSEFTQ305

COURSE TITLE: FOOD EXTRUSION TECHNOLOGY

Duration: 2hrs

Maximum Marks: 70

Short Answer Type Questions

Answer **10** Questions

Each question carries **2** marks

1. Define food extrusion and state its basic principle. [K] [1]
2. Identify the major components of a food extruder. [K] [1]
3. List the different types of extruders used in the food industry. [K] [1]
4. Describe the role of pre-conditioners in improving extrusion efficiency. [U] [1]
5. Differentiate between pre-conditioned and non-pre-conditioned raw materials. [U] [1]
6. Classify extruders based on their design and operating characteristics. [A] [2]
7. Outline the steps involved in vermicelli manufacture using extrusion. [K] [2]
8. Identify two quality parameters of extruded pasta. [K] [2]
9. Explain the role of the die in pasta and vermicelli production. [U] [2]
10. Differentiate between Newtonian and non-Newtonian behaviour of food materials.[U] [2]
11. Explain how temperature affects the rheological behaviour of extruded materials.[U] [2]
12. List two advantages of twin-screw extrusion.[K] [2]

[2 X 10 = 20]

Part B

Short Essay Type Questions

Answer **6** Questions

Each question carries **5** marks

13. Explain the principle of food extrusion and describe the major types of extruders and their applications in the food industry. [U] [1]
14. Describe the process of pre-conditioning of raw materials used in extrusion and explain the factors considered in extruder selection, design and operation. [U] [1]
15. Explain the working principle of a single-screw extruder. [U] [2]
16. Describe the manufacture of pasta and vermicelli using a single-screw extruder. [U] [2]
17. Differentiate between co-rotating and counter-rotating twin-screw extruders and applications. [U] [1]
18. Explain the rheological behaviour of food materials during extrusion [U] [2]
19. Describe the chemical and textural changes occurring in food during extrusion. [U] [3]
20. Classify the breakfast cereals [A] [3]

[6 X 5 = 30]

Part C

Long Essay Type Questions

Answer **2** Questions

Each question carries **10** marks

21. Explain the principles of food extrusion and describe the construction, working, types, major operating parameters and applications of extruders in the food industry. [U] [1]
22. Illustrate the working principle of a single-screw extruder and explain net flow, different operating zones and the manufacture of pasta and vermicelli by extrusion. [A] [2]
23. Compare co-rotating and counter-rotating twin-screw extruders with respect to their design, working principle, process characteristics and applications. [U] [2]
24. Describe the manufacture and quality testing of ready-to-eat breakfast cereals and explain recent advances such as CO₂/nitrogen-assisted extrusion, confectionery extrusion and non-thermal extrusion of protein products. [U] [4]

[2 X 10 =20]

MAHATMA GANDHI UNIVERSITY, KOTTAYAM
MGU-UGP (HONOURS)
FIFTH SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)

COURSE CODE:MG5SECFTQ300
COURSE TITLE: FOOD PRODUCT DEVELOPMENT

Duration: 1.5 hrs

Maximum Marks: 50

Part A

Short Answer Questions

Answer any 5 questions

Each question carries 2 marks

1. State the need for food product development. [U / CO1]
 2. List any two factors affecting food product development. [U / CO1]
 3. What is meant by product life cycle? [U / CO1]
 4. Define idea generation in new product development. [U / CO3]
 5. Mention any two purposes of consumer trials in product development. [U / CO3]
 6. What is accelerated shelf-life determination? [U / CO4]
 7. List any two factors influencing market acceptance of a new food product. [U / CO5]
- [5 × 2 = 10]**

Part B

Short Essay Questions

Answer any 5 questions.

Each question carries 4 marks.

8. Explain the role of market factors in food product development. [U / CO1]
 9. Describe the major characteristics of new food products. [U / CO1]
 10. Explain the major stages involved in idea screening and feasibility studies. [An / CO3]
 11. Explain the importance of recipe modification and scale-up in food product development. [An / CO4]
 12. Discuss the role of sensory evaluation and chemical assessment in evaluating a newly developed food product. [An / CO3]
 13. Explain any four factors that should be considered while developing a packaging system for maximum product stability. [E / CO4]
 14. Describe the major tools used to evaluate consumer attitudes, preferences and market acceptance. [E / CO5]
- [5 × 4 = 20]**

Part C

Long Essay Questions

Answer any 2 questions.
Each question carries 10 marks.

15. Explain the different stages involved in food product development, from idea generation to market testing. [An / CO3]
16. Explain the important factors to be considered in recipe development for a new food product. [E / CO4]
17. Explain the factors affecting the shelf life of a food product. Add a note on packaging and shelf-life evaluation. [E / CO4]
18. Develop a simple food product and describe how you would evaluate its nutritional value, sensory quality and shelf life. [C / CO5]
[2 × 10 = 20]