

Reg. No. []

Question Paper Code

13179

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2024

Seventh Semester

Computer Science and Engineering

20CYOE903 - PRINCIPLES OF FOOD PRESERVATION

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (MCQ) (20 × 1 = 20 Marks)

Answer ALL Questions

- | | <i>Marks</i> | <i>K-
Level</i> | <i>CO</i> |
|---|--------------|---------------------|------------|
| 1. Food spoilage primarily occurs due to: | <i>1</i> | <i>K1</i> | <i>CO1</i> |
| (a) Excess salt in food | | | |
| (b) Physical changes in temperature | | | |
| (c) Growth of bacteria, yeast, and mold | | | |
| (d) High protein content in foods | | | |
| 2. The term "shelf life" of a food product refers to: | <i>1</i> | <i>K1</i> | <i>CO1</i> |
| (a) The time it takes to cook the food | | | |
| (b) The time before it starts to taste different | | | |
| (c) The period during which food remains safe and suitable for consumption | | | |
| (d) The time it takes to sell the product in stores | | | |
| 3. Highly perishable foods typically have a shelf life of: | <i>1</i> | <i>K1</i> | <i>CO1</i> |
| (a) A few days | | | |
| (b) A few months | | | |
| (c) A few years | | | |
| (d) Indefinite | | | |
| 4. Which storage method involves controlling the composition of gases surrounding food? | <i>1</i> | <i>K1</i> | <i>CO2</i> |
| (a) Freezing | | | |
| (b) Canning | | | |
| (c) Refrigerated gas storage | | | |
| (d) Drying | | | |
| 5. The primary purpose of storing food at low temperatures is to: | <i>1</i> | <i>K1</i> | <i>CO2</i> |
| (a) Enhance flavor | | | |
| (b) Inhibit microbial growth | | | |
| (c) Increase nutrient content | | | |
| (d) Make food easier to digest | | | |
| 6. Sub-atmospheric storage of food involves: | <i>1</i> | <i>K1</i> | <i>CO2</i> |
| (a) Increasing oxygen levels | | | |
| (b) Reducing pressure below atmospheric levels | | | |
| (c) Heating the storage environment | | | |
| (d) Adding preservatives | | | |
| 7. Dehydro-freezing involves which two preservation processes? | <i>1</i> | <i>K1</i> | <i>CO3</i> |
| (a) Blanching and drying | | | |
| (b) Partial dehydration and freezing | | | |
| (c) Pasteurization and chilling | | | |
| (d) Fermentation and freezing | | | |
| 8. Aseptic packaging involves: | <i>1</i> | <i>K1</i> | <i>CO3</i> |
| a) Heating food in its final packaging | | | |
| (b) Sterilizing food and packaging separately before filling | | | |
| (c) Freezing food products | | | |
| (d) Drying food to remove moisture | | | |
| 9. Which of the following temperatures is commonly used in cold storage to slow down food spoilage? | <i>1</i> | <i>K1</i> | <i>CO3</i> |
| (a) 20-25°C | | | |
| (b) 0-4°C | | | |
| (c) 10-15°C | | | |
| (d) -18°C | | | |
| 10. In-container sterilization is commonly known as: | <i>1</i> | <i>K1</i> | <i>CO4</i> |
| (a) Flash pasteurization | | | |
| (b) Canning | | | |
| (c) Freezing | | | |
| (d) Aseptic packaging | | | |
| 11. Which of the following is an example of a continuous thermal processing method? | <i>1</i> | <i>K1</i> | <i>CO4</i> |
| (a) Canning | | | |
| (b) Pasteurization in a tubular heat exchanger | | | |
| (c) Water bath sterilization | | | |
| (d) Steam autoclaving | | | |
| 12. Reducing water activity in food primarily helps to: | <i>1</i> | <i>K1</i> | <i>CO4</i> |
| (a) Increase nutrient content | | | |
| (b) Inhibit microbial growth | | | |
| (c) Enhance flavor | | | |
| (d) Improve texture | | | |

13. The rate of drying in food products typically decreases during which phase? 1 K1 CO5
 (a) Initial drying phase (b) Constant-rate drying phase
 (c) Falling-rate drying phase (d) Preheating phase
14. Which of the following properties is crucial in determining the drying process in an air-water mixture? 1 K1 CO5
 (a) Viscosity of air (b) Density of water
 (c) Dew point temperature (d) Freezing point of water
15. What does a psychrometric chart represent? 1 K1 CO5
 (a) The relationship between temperature and pressure of water vapor
 (b) The relationship between temperature and humidity of air
 (c) The thermal conductivity of different materials
 (d) The enthalpy of various food products
16. In Individually Quick Freezing (IQF), food products are: 1 K1 CO5
 (a) Frozen in a block form
 (b) Frozen slowly to prevent crystallization
 (c) Rapidly frozen to preserve texture and shape
 (d) Stored at low temperatures without freezing
17. Ionizing radiation used for food preservation mainly works by: 1 K1 CO6
 (a) Reducing moisture content (b) Destroying microbial DNA
 (c) Altering the chemical composition of the food (d) Increasing nutrient content
18. The application of high pressure in food preservation is used to: 1 K1 CO6
 (a) Increase the boiling point of water
 (b) Inactivate enzymes and kill microorganisms without the use of heat
 (c) Add chemical preservatives to the food
 (d) Increase the shelf life by reducing water content
19. Fermentation in food processing is primarily used to: 1 K1 CO6
 (a) Enhance flavor (b) Increase the nutritional value
 (c) Both a and b (d) Decrease the shelf life
20. In membrane technology, what is the primary function of membranes in food processing? 1 K1 CO6
 (a) To separate components based on size or charge (b) To improve food flavor
 (c) To increase the moisture content (d) To sterilize the food

PART - B (10 × 2 = 20 Marks)

Answer ALL Questions

21. Comment on how packaging influences the shelf life of food products. 2 K2 CO1
22. How does the method of pasteurization help in preserving food? 2 K2 CO1
23. Explain why freshly harvested crops are more susceptible to spoilage. 2 K2 CO2
24. Why is nitrogen commonly used in the atmospheric storage of grains and seeds? 2 K2 CO2
25. Highlight the necessity to blanch certain foods before freezing. 2 K2 CO3
26. Signify why humidity control important in cold storage design. 2 K2 CO3
27. Differentiate between batch and continuous thermal processing in terms of production scale. 2 K2 CO4
28. Describe how water activity is controlled in foods to inhibit microbial growth. 2 K2 CO4
29. Define enthalpy and explain its relevance to food processing. 2 K2 CO5
30. Explain why ultrasonic waves are considered a non-thermal method for food preservation. 2 K2 CO6

PART - C (6 × 10 = 60 Marks)

Answer ALL Questions

31. a) Summarize the processes of food deterioration and spoilage in processed foods, highlighting the biological, chemical, and physical factors that contribute to these processes. 10 K2 CO1

OR

- b) Describe various methods of food preservation, including physical methods, chemical methods, and biological methods, and explain how each method helps prevent food spoilage. 10 K2 CO1

32. a) Identify the role of low-temperature storage in preserving the raw materials, covering how it affects microbial activity and enzyme action. 10 K2 CO2

OR

- b) Highlight the principles and applications of gas-packed refrigerated foods and how altering the gas composition in packaging extends the shelf life of perishables. 10 K2 CO2

33. a) Illustrate retort pouch packaging, including its materials, processing method, and the types of foods typically preserved in this way. 10 K2 CO3

OR

- b) Assess the critical factors in the design of freezers and cold storage facilities, including considerations for temperature control, insulation, humidity control, and energy efficiency. 10 K2 CO3

34. a) Describe in-container sterilization (canning) and its effectiveness in ensuring food safety for long shelf life. 10 K2 CO4

OR

- b) Discuss ohmic heating, including its principles, advantages, and applications in the preservation of liquid and semi-liquid foods. 10 K2 CO4

35. a) Outline the factors that influence the rate of drying in food products, including the phases of drying and their characteristics. 10 K2 CO5

OR

- b) Interpret the key properties represented on the psychrometric chart and how those factors are used to control the environment in food storage systems. 10 K2 CO5

36. a) Comment on the supercritical technologies used for food preservation along with the mechanism of action for each preservation method and their advantages and disadvantages. 10 K2 CO6

OR

- b) Summarize about the hurdle technology process in detail. 10 K2 CO6