



UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF CHEMICAL AND BIO-ENGINEERING TECHNOLOGY

FINAL EXAMINATION
OCTOBER 2025 SEMESTER

COURSE CODE : CQB 20903
COURSE TITLE : FOOD PRODUCT DESIGN AND DEVELOPMENT
PROGRAMME NAME : BACHELOR OF FOOD SAFETY AND QUALITY TECHNOLOGY WITH HONOURS
DATE : 03 FEBRUARY 2026
TIME : 2:00PM - 5:00PM
DURATION : 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. This question paper consist of TWO sections.
4. Answer ALL questions for Section A.
5. Section B consist of four questions. Answer THREE (3) questions only.
6. Please write your answer on the answer booklet provided.
7. Please answer all questions in English only.
8. Please answer MCQ/EMQ questions using OMR sheet. ☐ *Tick if applicable*
9. Refer to the attached Formula/ Appendies. ☐ *Tick if applicable*

SECTION A (Total: 40 marks)

Answer ALL questions.

Please use the answer booklet provided.

1. What is the main goal of shelf life testing in prototype development?
 - A. To optimize the product formulation
 - B. To evaluate the product's sensory attributes
 - C. To establish the time when the product no longer maintains expected quality
 - D. To determine the product's marketability

2. What is the primary purpose of prototyping in the product development process?
 - A. To optimize the product through statistical designs
 - B. To finalize the product for commercialization
 - C. To test various aspects of the design and gather early user feedback
 - D. To conduct sensory evaluation

3. Which stage in the new-product development process involves evaluating a new product in simulated or actual market situations?
 - A. Prototype Development
 - B. Idea Generation
 - C. Commercialization
 - D. Test Marketing

4. In the product design and process development phase, what is the purpose of benchmarking?
 - A. To scale up production
 - B. To develop a prototype
 - C. To evaluate competitive products and identify flavor opportunities
 - D. To optimize the product formulation
5. During product commercialization, what is a critical factor to ensure the product is launched at the correct time?
 - A. Conducting market opportunity assessment
 - B. Developing a strategic plan
 - C. Creating a business plan
 - D. Controlling financial resources and time
6. Which of the following best describes the role of tacit knowledge in product development?
 - A. Specific to a context or area
 - B. Easily codified and transferred
 - C. Primarily stored in manuals and textbooks
 - D. Unrelated to individual experiences
7. How does the text suggest managing the creation of knowledge in product development?
 - A. By focusing only on technical skills
 - B. By selecting team members with diverse knowledge and skills
 - C. By relying solely on explicit knowledge
 - D. By avoiding interaction with the external environment

8. What is the first phase of a product lifecycle?
- A. Introductory period
 - B. Decline period
 - C. Growth period
 - D. No-growth period
9. In the context of product development, what is the significance of shelf-life testing?
- A. To increase the nutritional value of the product
 - B. To ensure consumer safety and product quality
 - C. To simplify the production process
 - D. To reduce production costs
10. A company's range of different yogurt flavors and types constitutes its _____.
- A. Product mix
 - B. Marketing strategy
 - C. Production process
 - D. Product line
11. The stage in new product development where ideas are screened for feasibility and market potential is called _____.
- A. Idea screening
 - B. Concept testing
 - C. Idea generation
 - D. Business analysis

12. The primary source of ideas for new food products often comes from _____.
A. Customer feedback
B. Government regulations
C. Technological advances
D. Competitor analysis
13. The stage in the product lifecycle characterized by rapid market expansion is _____.
A. Decline
B. Growth
C. Maturity
D. Introduction
14. _____ is a technique that can extend the shelf life of perishable food products without the use of preservatives.
A. Canning
B. Blanching
C. High-pressure processing
D. Freeze-drying
15. Before launching a new food product, it is essential to conduct _____ to assess consumer acceptance.
A. Production trials
B. Sensory testing
C. Financial analysis
D. Market research

16. In food product development, the concept of economies of scale is critical in the context of _____.
A. Production volume
B. Packaging design
C. Ingredient sourcing
D. Marketing strategies
17. The reliability and quality of ingredients supplied can significantly impact _____ in food production.
A. Packaging decisions
B. Market research
C. Product flavor
D. Concept testing
18. Introducing a new flavor of an existing snack food is an example of a _____ strategy.
A. Diversification
B. Product development
C. Market penetration
D. Market development
19. In a food company, the department often responsible for generating innovative product ideas is _____.
A. Finance
B. Research and Development
C. Sales
D. Human Resources

20. A preliminary version of a new beverage is presented to a focus group to gather feedback. This is an example of _____.
A. Concept testing
B. Product launch
C. Business analysis
D. Market analysis
21. In the new product development process, the stage where the product's design and manufacturing methods are finalized is known as _____.
A. Concept development
B. Commercialization
C. Market testing
D. Product design
22. Contracting a third-party manufacturer to produce a specific ingredient for a new food product is an example of _____.
A. Vertical integration
B. Co-branding
C. Cross-merchandising
D. Outsourcing
23. The ultimate step in the food product development process, involving the product's introduction to the market, is known as _____.
A. Product launch
B. Market analysis
C. Product evaluation
D. Feedback gathering

24. A food product is considered to have superior quality when _____.
A. It is produced using the latest technology
B. It is available in multiple markets
C. It has a higher price point than competitors
D. It meets and exceeds customer expectations
25. One of the key benefits of food processing is _____.
A. Extending the shelf life and safety of food
B. Reducing the cost of food production
C. Enhancing the aesthetic appeal of food
D. Creating new food categories
26. The primary difference between joint products and by-products in food processing is _____.
A. The raw materials used in their production
B. The stage of production at which they are created
C. Their respective market values
D. The methods used to process them
27. Expanding a food company's product line with new, innovative products represents a _____ growth strategy.
A. Vertical
B. External
C. Internal
D. Horizontal

28. A chef experimenting with new recipes in a restaurant to develop a unique dish exemplifies _____.
A. Product analysis
B. Commercialization
C. Concept testing
D. Idea generation
29. Sales people bringing suggestions for a new fast food item to the headquarters of their food manufacturer is an example of _____.
A. Commercialization
B. Product analysis
C. Idea generation
D. Concept testing
30. Which step in the product strategy process involves creating a product development portfolio?
A. Step Two
B. Step Four
C. Step One
D. Step Six
31. What is the relationship between disembodied and embodied knowledge in product development?
A. Disembodied knowledge is irrelevant to product development
B. Embodied knowledge is created before disembodied knowledge
C. Disembodied knowledge eventually becomes embodied in the product
D. Embodied knowledge is created after disembodied knowledge

32. What is the role of product support in the product introduction phase?
- A. To provide feedback for product improvements and new opportunities
 - B. To conduct market strategy and testing
 - C. To define the product specifications
 - D. To develop the initial prototype
33. What is a new food product?
- A. A product that is similar to existing products.
 - B. A product that has been modified slightly.
 - C. A product that has not been presented before in any marketplace.
 - D. A product that has been sold before in the same market.
34. Which strategy focuses on being the first to market with innovation?
- A. Customer-responsive
 - B. Prospector
 - C. Market-driven
 - D. Reactor
35. Which component refers to the physical features of a product?
- A. Packaging component
 - B. Marketing component
 - C. Support service component
 - D. Core component

36. What is a critical factor for successful product innovation?
- A. Isolating technological knowledge
 - B. Avoiding commercial knowledge
 - C. Dominating the market
 - D. Integrating various types of knowledge
37. Which concept testing approach involves the gradual refinement of new ideas into a market-accepted form?
- A. Concept Development
 - B. Prototype
 - C. Protocept
 - D. Final Product
38. What is the primary output of the situation analysis in the product strategy process?
- A. A set of threshold criteria
 - B. A list of new product options
 - C. A compilation of current information about the customer, competition, and company competencies
 - D. A map of market opportunities
39. Why is new product development important?
- A. To maintain old products in the market.
 - B. To replace or reinvigorate products losing profitability
 - C. To reduce production costs.
 - D. To avoid competition.

40. Which sampling method involves selecting every Nth name from the target population list?
- A. Random Sampling
 - B. Systematic Sampling
 - C. Convenience Sampling
 - D. Stratified Sampling

SECTION B (Total: 60 marks)

Answer THREE (3) questions only.

Please use the answer booklet provided.

Question 1

The journey of introducing a new food product involves multiple strategic investments and innovations to ensure the product not only stands out but also succeeds in a competitive marketplace. Understanding these aspects is essential for anyone looking to navigate the food industry effectively.

- (a) Discuss **FOUR (4)** types of investments that are crucial when introducing a new food product to the market.

(8 marks)

- (b) Explain the **THREE (3)** categories of innovation within a market, considering the level of novelty and impact

(6 marks)

- (c) Discuss the important stages in product commercialization.

(6 marks)

Question 2

When developing a new product, understanding and managing its shelf life is crucial. The shelf life of a product not only affects its safety and quality but also influences consumer satisfaction and brand reputation.

- (a) Define shelf life of a new product. Describe the shelf life requirements of a product.
(4 marks)
- (b) Discuss the factors affecting shelf life and product attributes
(6 marks)
- (c) Discuss the stages involved in a product development process
(10 marks)

Question 3

Product innovation is defined as the development of new products, changes in design of established products, or use of new materials or components in the manufacture of established products.

- (a) Choose a specific type of food product innovation (e.g., a new healthy snack). Create a detailed flow chart that outlines the sequence of events in the development process of this product, including stages such as idea generation, product design, testing, and market introduction.
(10 marks)
- (b) Evaluate the benefits of this innovative food product compared to a similar existing product in the market. Consider aspects such as nutritional value, target market appeal, environmental impact, and potential market trends.
(10 marks)

Question 4

In the competitive world of product development and marketing, not all products succeed. Understanding the reasons for product failure and the mechanisms of food deterioration is crucial for developing strategies to overcome these challenges. Additionally, analyzing cost structures helps in pricing strategies and financial planning.

- (a) There are many reasons why products fail. List **FOUR (4)** reasons and **FOUR (4)** safeguards in order to overcome these problems.

(8 marks)

- (b) List down **THREE (3)** principal mechanisms involved in the deterioration of processed foods.

(6 marks)

- (c) Dumex (M) Sdn Bhd sells an infant formula for RM130 a unit. The Fixed Costs for buildings machines and employees are RM6,000 a week while raw material and other Variable costs are RM50 a unit.

- i. What is the break even point for the system?
- ii. What is the profit if the company sell 100 units a week?
- iii. What is the profit if the UP is lowered to RM80 and sales rise to 250 units/week?

(6 marks)

END OF EXAMINATION PAPER