GUJARAT TECHNOLOGICAL UNIVERSITY

BE-6 SEMESTER – OLD PAPER – S22 TO S26 – QUESTION BANK

Subject Name & Code: PRODUCT DEVELOPMENT AND ENTREPRENEURSHIP - 3161916

Chapter 1: Product Development Processes

Repeated Questions:

1. Product Development – Concept and Characteristics:

- **Q.** What is product development? Give examples. **(SUMMER 2023; WINTER 2024)**
- **Q.** Explain the characteristics of successful product development. **(SUMMER 2023, 4 Marks; SUMMER 2024, 3 Marks; WINTER 2024; SUMMER 2025, 7 Marks; SUMMER 2026)**

2. Product Life Cycle:

- **Q.** Describe briefly the phases of product life cycles. **(WINTER 2022; SUMMER 2023, 7 Marks; WINTER 2024, 4 Marks; SUMMER 2025, 7 Marks)**
- **Q.** Discuss Product life cycles. **(SUMMER 2024, 4 Marks; SUMMER 2026, 7 Marks OR)**

3. Challenges and Process Phases:

- **Q.** Discuss the challenges in Product development. **(SUMMER 2024; SUMMER 2025, 4 Marks; SUMMER 2026)**
- **Q.** Explain the different phases of the generic product development process. **(SUMMER 2025, 7 Marks; SUMMER 2026, 4 Marks)**

4. Reverse Engineering:

- **Q.** Write advantages of Reverse Engineering. **(SUMMER 2022; WINTER 2024)**

Other Important Questions:

1. Product Development Process – Characteristics, Phases and Challenges:

- **Q.** Explain characteristics of product development process. **(WINTER 2025, 7 Marks)**
- **Q.** List out challenges faced by product development process. **(WINTER 2025, 3 Marks)**
- **Q.** List the various phases in product development process and explain all in detail. **(WINTER 2023, 7 Marks)**
- **Q.** Explain the importance of product development to become a successful entrepreneur. **(SUMMER 2026)**

2. Product Life Cycle:

- **Q.** Write a detailed short note on Product life cycle. **(WINTER 2025, 4 Marks)**
- **Q.** What is Product life cycle? Explain each stage with example. **(WINTER 2023, 4 Marks)**
- **Q.** Explain the following: a) Product Life Cycle... **(WINTER 2023, 4 Marks)**

3. Product Planning and Reverse Engineering:

- **Q.** Define product planning. Explain the product planning process in detail. **(WINTER 2022, 7 Marks)**
- **Q.** Explain Reverse Engineering and Redesign Product development Processes. **(SUMMER 2023, 7 Marks)**

Chapter 2: Product Planning and Customer Needs

Repeated Questions:

1. Customer Needs and Interviewing:

- **Q.** Why is customer need very important for the product development process? **(SUMMER 2022; WINTER 2024)**
- **Q.** Explain the articulated use methods for interviewing the customers, by taking suitable examples. **(SUMMER 2022, 4 Marks; SUMMER 2025)**
- **Q.** Explain methods used to determine customer need importance. **(WINTER 2022 OR; SUMMER 2024)**
- **Q.** Explain like-dislike method to conduct interview. **(SUMMER 2023, 3 Marks; SUMMER 2024 OR)**

2. Opportunity Identification and Concept Generation:

- **Q.** Explain opportunity identification process. **(SUMMER 2022, 7 Marks - appears as Q3(a) under the OR section; WINTER 2024)**
- **Q.** Discuss concept generation process. **(SUMMER 2022, 3 Marks; SUMMER 2026, 7 Marks)**

3. Affinity Diagram:

- **Q.** Why are affinity diagrams used for product planning? **(WINTER 2022; SUMMER 2024, 3 Marks OR)**

Other Important Questions:

1. Product Planning:

- **Q.** Justify the statement "Allocate Resources and Plan Timing plays significant role for product planning". **(WINTER 2025, 4 Marks)**
- **Q.** Explain the importance of elements in the product planning process. **(WINTER 2025, 7 Marks OR)**
- **Q.** Explain the stepwise procedure of the product planning process. **(SUMMER 2025, 7 Marks OR)**
- **Q.** Write short note on product planning. **(WINTER 2023, 7 Marks OR)**

2. Customer Needs:

- **Q.** Explain the common customer needs which should be known. **(WINTER 2025, 7 Marks)**
- **Q.** Explain the different types of customer needs. **(SUMMER 2025, 4 Marks)**
- **Q.** Which are the different types of customer needs? **(SUMMER 2023, 4 Marks)**
- **Q.** Describe the various methods used to determine customer need importance. **(WINTER 2024, 7 Marks OR)**

3. Opportunities and New Ideas:

- **Q.** How to prioritise the opportunities? **(SUMMER 2024, 3 Marks)**
- **Q.** Types of methods for generating new ideas. **(WINTER 2023, 3 Marks)**
- **Q.** Which are the different sources of new ideas? **(WINTER 2023, 3 Marks)**

4. Concept Development and Testing:

- **Q.** What is affinity diagram? Draw an affinity diagram with a suitable example. **(SUMMER 2022, 7 Marks)**
- **Q.** Write and discuss the different survey formats in concept testing process with example. **(WINTER 2023, 7 Marks)**
- **Q.** Enlist the steps involved in concept selection process. **(SUMMER 2026, 3 Marks)**
- **Q.** Define the terms: (i) Function and worth (ii) Economic value and Aesthetic value. **(WINTER 2023, 4 Marks)**

Chapter 3: Product Configuration and Design for Function / Design for Manufacturing, Prototyping and Product Architecture

Repeated Questions:

1. Design for Maintenance:

- **Q.** Write importance of designing for maintenance. **(SUMMER 2022; SUMMER 2023; SUMMER 2024 OR; WINTER 2024)**

2. Prototyping and 3D Printing:

- **Q.** Explain virtual prototyping with an example of CAD. **(SUMMER 2022; WINTER 2024; SUMMER 2026, 4 Marks OR)**
- **Q.** Write advantages of 3D Printing. **(SUMMER 2022 OR; SUMMER 2024, 4 Marks; WINTER 2024 OR; WINTER 2025, 3 Marks OR)**
- **Q.** Explain free-form fabrication method (additive manufacturing) as a prototyping technique. **(WINTER 2022, 7 Marks OR; SUMMER 2023, 7 Marks; SUMMER 2024 OR; SUMMER 2026, 7 Marks OR)**

3. Product Modularity:

- **Q.** What is product modularity? Explain various types of product modularity. **(WINTER 2022; SUMMER 2024; WINTER 2024 OR; SUMMER 2025, 7 Marks)**

4. Design for Assembly:

- **Q.** How is the design for assembly (DFA) methodology important to minimize the cost of assembly? Explain briefly. **(WINTER 2022; WINTER 2024 OR)**

5. Product Specifications and Function Analysis:

- **Q.** Enlist the steps required to target the product specifications. **(WINTER 2022, 3 Marks; WINTER 2024, 3 Marks)**
- **Q.** Describe the function analysis approach used for product development. **(WINTER 2022, 7 Marks OR; SUMMER 2026, 7 Marks)**

Other Important Questions:

1. Design for Maintenance:

- **Q.** Enlist the different types of maintenance operations in the industry. **(SUMMER 2025, 3 Marks OR)**
- **Q.** What is design for maintainability of the product? **(WINTER 2022, 3 Marks OR)**
- **Q.** Prepare the list of steps involved in design for product maintenance. **(SUMMER 2026, 3 Marks)**

2. Function Analysis and Value:

- **Q.** What is functional analysis in engineering? **(SUMMER 2022, 3 Marks)**
- **Q.** What is a Function Family Tree (FFT)? Explain it. **(SUMMER 2025, 3 Marks)**
- **Q.** Explain the types of functions of any product. **(SUMMER 2025, 3 Marks)**
- **Q.** Definition: (i) Political Value and Social Value (ii) Plan value and Time value. **(WINTER 2023, 4 Marks)**

3. Product Modularity and Architecture:

- **Q.** What is Module heuristics? State its applications. **(WINTER 2025, 3 Marks)**
- **Q.** Name type of Product Modularity. **(SUMMER 2022, 4 Marks OR)**
- **Q.** Which are the steps to establish the product architecture? **(SUMMER 2023, 3 Marks OR)**
- **Q.** List the steps to establish the product architecture. **(SUMMER 2024, 3 Marks)**
- **Q.** Define the product architecture and its types. **(SUMMER 2026, 3 Marks OR)**

4. Design for Manufacturing and Assembly:

- **Q.** Explain guidelines for evaluation of the Overall Assembly. **(SUMMER 2022, 7 Marks)**
- **Q.** Explain the General Guideline for optimizing the number of parts in the design. **(SUMMER 2025, 7 Marks OR)**
- **Q.** How are the manufacturing costs of a product decided in DFM methodology? Explain in detail. **(WINTER 2022, 7 Marks)**
- **Q.** Describe the evaluation techniques of design for manufacturing methodology. **(SUMMER 2026)**

5. 3D Printing:

- **Q.** Enlist the advantages of 3D printing. **(SUMMER 2025, 4 Marks)**
- **Q.** Briefly describe 3-D printing technology. Write its advantages. **(SUMMER 2023, 7 Marks OR)**

6. Reverse Engineering and Industrial Design:

- **Q.** Explain briefly the concept of reverse engineering for product development. **(WINTER 2022, 4 Marks)**
- **Q.** How is industrial design important to a product? Also write its aesthetic needs. **(WINTER 2023, 7 Marks)**

Chapter 4: Product Architecture and Virtual Product Prototyping

Repeated Questions:

None identified.

Other Important Questions:

1. Product Modularity:

- **Q.** What is product modularity? Explain the modularity design in brief. **(WINTER 2025, 3 Marks)**

Chapter 5: Entrepreneurship: Concept, Knowledge and Skills Requirement

Repeated Questions:

1. Managerial vs. Entrepreneurial Approach:

- **Q.** Differentiate between managerial vs. entrepreneurial approach. / Differentiate the managerial and entrepreneur approach. **(WINTER 2022, 4 Marks; SUMMER 2023, 4 Marks; SUMMER 2024, 4 Marks; WINTER 2024, 7 Marks; SUMMER 2025, 4 Marks; WINTER 2025, 3 Marks)**

2. Role of Entrepreneurship in Economic Development:

- **Q.** Explain the role of entrepreneurship in economic development. **(SUMMER 2022, 7 Marks; WINTER 2022, 4 Marks; SUMMER 2023, 7 Marks; SUMMER 2024, 7 Marks; WINTER 2024, 4 Marks; SUMMER 2025, 7 Marks OR; WINTER 2025, 4 Marks)**

3. Entrepreneur – Meaning, Characteristics and Skills:

- **Q.** Define Entrepreneur and Entrepreneurship. **(SUMMER 2022; WINTER 2024 OR; SUMMER 2026, 4 Marks)**
- **Q.** Enlist characteristics required for successful entrepreneurs. **(WINTER 2022; SUMMER 2024; SUMMER 2025; SUMMER 2026, 3 Marks)**
- **Q.** Discuss knowledge and skills required for successful entrepreneur. **(SUMMER 2022; SUMMER 2023, 3 Marks; SUMMER 2024, 4 Marks OR)**

4. Creative Problem Solving and E-Commerce:

- **Q.** What do you mean by creative problem solving? **(SUMMER 2022 OR; SUMMER 2024, 3 Marks OR)**
- **Q.** What is the importance of e-commerce technology for entrepreneurs? **(SUMMER 2022, 7 Marks OR; WINTER 2024, 4 Marks OR)**

Other Important Questions:

1. Entrepreneurship – Characteristics, Process and Emergence:

- **Q.** Explain the characteristics required for successful entrepreneur. **(WINTER 2025, 4 Marks OR)**
- **Q.** Explain the Entrepreneurship Process. **(SUMMER 2025, 4 Marks)**
- **Q.** Enlist the factors impacting emergence of entrepreneurship. **(WINTER 2022, 3 Marks OR)**
- **Q.** Discuss the factors propelling innovation and entrepreneurship in relation to new products. **(SUMMER 2026, 7 Marks)**

2. Sources of Finance:

- **Q.** Characteristics of Venture Capital as a source of financing. **(WINTER 2023, 3 Marks OR)**
- **Q.** Role and Importance of Commercial Banks in India. **(WINTER 2023, 4 Marks OR)**
- **Q.** Write full name: (i) SEBI (ii) EPFO (iii) NBFC. **(WINTER 2023, 3 Marks)**

3. Creativity and Innovation:

- **Q.** What is an inventive problem? **(WINTER 2023, 3 Marks OR)**
- **Q.** How does Brainstorming play a vital role in generating new ideas? **(WINTER 2023, 4 Marks OR)**

Chapter 6: Starting the Venture: Industry Analysis and Feasibility Study

Repeated Questions:

1. Industry Analysis:

- **Q.** Explain the Five competitive force models for industry analysis. **(SUMMER 2025, 4 Marks; WINTER 2025, 7 Marks OR)**

2. Feasibility Study:

- **Q.** What is feasibility study? Explain financial feasibility and technical feasibility by taking suitable example. **(SUMMER 2025, 7 Marks; WINTER 2025, 7 Marks)**
- **Q.** Define: Market feasibility, Technical/operational feasibility, Financial feasibility. **(SUMMER 2023, 3 Marks OR; SUMMER 2026 OR)**
- **Q.** Describe in detail the importance of feasibility study for a new venture. **(WINTER 2022; WINTER 2024, 4 Marks OR)**

3. Business Plan:

- **Q.** Explain presentation of business plan to investors. **(SUMMER 2023, 4 Marks OR; SUMMER 2024)**

Other Important Questions:

1. Industry Analysis:

- **Q.** What is industry analysis? Explain Porter's five force model for industry analysis. **(WINTER 2025, 7 Marks OR)**

2. Feasibility Study:

- **Q.** Explain technical and financial feasibility. **(SUMMER 2024, 7 Marks OR)**
- **Q.** Why is feasibility study required? Explain different types of feasibility studies in brief. **(SUMMER 2025, 7 Marks)**
- **Q.** Enlist important parameters of feasibility study for a business. **(SUMMER 2022, 7 Marks OR)**
- **Q.** Explain the importance of different feasibility studies for any organization to start a new business. **(WINTER 2023, 4 Marks OR)**

3. Business Plan:

- **Q.** What is business plan? Enlist the key components of business plan. **(WINTER 2025, 3 Marks OR)**
- **Q.** What are the contents of the business plan? **(SUMMER 2025, 3 Marks OR)**
- **Q.** Enlist the necessary steps to be followed by an entrepreneur while drawing a business plan. **(WINTER 2022, 4 Marks OR)**
- **Q.** Prepare a drawing of a business plan. **(SUMMER 2026, 4 Marks OR)**
- **Q.** Write short note on preparing project report and presenting business plan to investors. **(SUMMER 2026, 7 Marks OR)**

4. Inventive Problems, Patents and Development Projects:

- **Q.** What are the inventive problems? Also explain the five levels of solution. **(WINTER 2023, 7 Marks OR)**
- **Q.** Explain the different types of product development project and give the reasons for poor development planning. **(WINTER 2023, 7 Marks)**
- **Q.** Discuss the patent search process briefly and give the details contained in a patent by giving the patent sample. **(WINTER 2023, 7 Marks OR)**

Chapter 7: Functional Plans: Marketing, Financial and Manpower Planning

Repeated Questions:

1. Marketing Plan:

- **Q.** Write steps in preparing a marketing plan with appropriate flow chart. **(SUMMER 2022, 7 Marks; SUMMER 2023; WINTER 2024; SUMMER 2026, 3 Marks)**

2. Financial Plan:

- **Q.** Write short note on break even analysis. **(SUMMER 2022 OR; SUMMER 2025, 3 Marks; WINTER 2025, 4 Marks)**
- **Q.** Discuss working capital. **(SUMMER 2022, 3 Marks; WINTER 2024 OR)**
- **Q.** How can financial planning be done by an entrepreneur for the new venture? **(WINTER 2022 OR; WINTER 2024, 3 Marks)**
- **Q.** What is Pro forma balance sheet? How is the breakeven analysis useful for a new venture? **(WINTER 2022 OR; WINTER 2024, 7 Marks OR)**
- **Q.** Discuss for Financial plan: cash budget, working capital and break even analysis. **(SUMMER 2024, 7 Marks; SUMMER 2026, 7 Marks)**

3. Manpower Planning:

- **Q.** Why is manpower planning important in entrepreneurial business? **(SUMMER 2022, 4 Marks; WINTER 2024)**

4. Franchising and Licensing:

- **Q.** Write a short note on franchising. **(SUMMER 2022, 3 Marks OR; SUMMER 2023, 7 Marks OR)**
- **Q.** Differentiate between licensing and franchising. **(SUMMER 2025; WINTER 2025, 4 Marks OR)**

Other Important Questions:

1. Marketing Plan and Marketing Research:

- **Q.** Enlist the steps for preparing market plan. **(WINTER 2025, 3 Marks)**
- **Q.** How to carry out marketing research for the new venture? Discuss the steps in preparing marketing plan. **(SUMMER 2023, 7 Marks)**
- **Q.** Write the steps for marketing research for the new venture. **(SUMMER 2024, 3 Marks)**
- **Q.** How can the marketing plan for the new venture be prepared? Describe with detailed steps. **(WINTER 2022, 7 Marks)**
- **Q.** Why is marketing research required for the new venture? **(SUMMER 2025, 3 Marks)**

2. Financial Plan:

- **Q.** What is Pro forma income statement? Explain Pro forma cash flow and balance sheet in financial plan. **(WINTER 2025, 7 Marks)**
- **Q.** Define break even analysis. Explain it with sketch. **(SUMMER 2023, 3 Marks)**

3. Manpower and Organizational Plan:

- **Q.** How is manpower planning important for an entrepreneur? **(WINTER 2022, 3 Marks)**
- **Q.** Explain manpower planning and Financial plan for business. **(SUMMER 2023, 4 Marks)**
- **Q.** Describe the short note on organizational plan. **(SUMMER 2026, 4 Marks)**

4. Additive Manufacturing:

- **Q.** What is additive manufacturing? Explain it briefly. **(SUMMER 2025, 4 Marks)**

Chapter 8: Issues Related to Product Development and Entrepreneurship: Intellectual Property Rights and Legal Issues

Repeated Questions:

1. IPR – Trademark, Copyright and Patent:

- **Q.** Explain briefly 1) Trademark 2) Copyright and 3) Patent. **(SUMMER 2023, 3 Marks OR - 3 Marks for definitions; SUMMER 2025, 7 Marks)**
- **Q.** Describe in details the terminology related with intellectual property rights (i) trademarks (ii) trade secrets (iii) copyrights. **(WINTER 2024, 7 Marks OR; SUMMER 2026, 4 Marks OR)**
- **Q.** What is patent? Explain in detail about utility patents. **(WINTER 2022, 7 Marks; SUMMER 2024, 4 Marks)**

Other Important Questions:

1. IPR – Meaning, Objectives and Importance:

- **Q.** What are the objectives of Intellectual property rights? **(SUMMER 2025, 3 Marks)**
- **Q.** What do you mean by intellectual property rights? **(SUMMER 2024, 3 Marks)**
- **Q.** Write a short note on intellectual property rights. **(SUMMER 2023, 7 Marks OR)**
- **Q.** Elaborate the importance of IPR in overall growth of country using suitable example. **(SUMMER 2026, 7 Marks OR)**
- **Q.** Explain the following: ... b) IPR ... **(WINTER 2023, 4 Marks)**

2. Trademarks, Trade Secrets and Franchising:

- **Q.** Define and explain trademark and copyright. **(SUMMER 2022, 7 Marks OR)**
- **Q.** Describe in details the terminology related with intellectual property rights (i) trademarks (ii) trade secrets (iii) franchising. **(WINTER 2022, 7 Marks OR)**
- **Q.** Give a case study or example with reference to trade secrets. **(SUMMER 2024, 7 Marks)**

3. Patents and Legal Issues:

- **Q.** Write a short note on legal issues related to product development and entrepreneurship. **(WINTER 2025, 7 Marks OR)**
- **Q.** Enlist the legal issues in patents due to IPR. **(SUMMER 2026, 3 Marks OR)**

4. Objective-Type and Miscellaneous:

- **Q.** Answer the following questions: 1) Which one is NOT a part of 4Ps (Marketing Mix)? a) Product b) Price c) Promotion d) Packaging. 2) Intellectual property right (IPR) in India covers: a) Patents b) Copyrights c) Trademarks d) All of the above. 3) Assign True (T) or False (F) for the following statement: "Patent is granted for innovation or improvement in invention". **(WINTER 2025, 3 Marks OR)**
- **Q.** Explain the following: (a) Overhead cost (b) TRIZ (c) Market Research. **(WINTER 2023, 3 Marks OR)**
- **Q.** List the causes of failure of new product and justify the statement "Incorrectly placed, priced and advertised new product generally leads to failure in market." **(WINTER 2023, 7 Marks OR)**

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