

# CBCS SCHEME

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17ME835

## Eighth Semester B.E. Degree Examination, July/August 2022 Product Life Cycle Management

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- 1 a. Define Product Life Cycle Management. Discuss the Opportunities (any 4) of Product Life Cycle Management. (10 Marks)  
b. Discuss briefly the various Components of Product Life Cycle Management. (10 Marks)

OR

- 2 a. Discuss briefly the steps involved in the development of a PLM strategy. (10 Marks)  
b. Explain the basic component of Product Data Management System. (10 Marks)

### Module-2

- 3 a. List the benefits and objectives of a good Product Design. (10 Marks)  
b. What is Concurrent Engineering? List the advantages of Concurrent Engineering. (10 Marks)

OR

- 4 a. Discuss briefly the various steps involved in Product Design Process. (07 Marks)  
b. What is Product Recycling? Also discuss the benefits of Recycling. (13 Marks)

### Module-3

- 5 a. What is New Product Development (NPD)? Discuss the need for NPD. (10 Marks)  
b. Explain the step involved in NPD. (10 Marks)

OR

- 6 a. Explain the steps involved in structuring New Product Development. (14 Marks)  
b. List the characteristics of an ideal Decision Support System. (06 Marks)

### Module-4

- 7 a. Discuss the meaning of Technological change with examples. Also mention its impact on Society. (10 Marks)  
b. Explain the following Technology Forecasting method :  
Brain Storming , Delphi technique and Scenario writing. (10 Marks)

OR

- 8 a. What is Technology Forecasting? Mention the reasons for Technology Forecasting. (08 Marks)  
b. Explain 'Relevance Tree Technique' of Forecasting with a suitable example. (12 Marks)

### Module-5

- 9 a. What is Virtual Product Development? Mention the benefits of Virtual Product Development. (10 Marks)  
b. Discuss the 3D , CAD system used for Virtual Product Development, also mention its benefits. (10 Marks)

OR

- 10 a. What is Product Data Technology? Discuss the classification of Product Data. (10 Marks)  
b. Illustrate the Generic Product Structure of a Bicycle. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.



Scheme & Solutions

  
Signature of Scrutinizer

Subject Title : Product Life Cycle Management. Subject Code : 17 ME 835

Question Number	Solution	Marks Allocated
1 a	<p><u>Definition</u>:- PLCM is a software enabled strategy that manages all data relating to the design, functioning, production, support and ultimate disposal of the product.</p> <p><u>Opportunities</u>:-</p> <ol style="list-style-type: none"> <li>1. It enables development and support of new products and services.</li> <li>2. It redefines the technological aspects and processes in developing smart or intelligent products.</li> </ol> <p style="text-align: right;">Any 4 opportunities x 2 = 8 ✓</p>	2
b	<p>Components of PLCM:-</p> <ol style="list-style-type: none"> <li>1. Product and product data</li> <li>2. Organizational structure</li> <li>3. Business processes &amp; working methods</li> <li>4. Information systems :- People, processes, technology.</li> <li>5. Interfaces and standards</li> </ol> <p style="text-align: right;">5 points x 2 = 10 ✓</p>	
2 a	<p>Steps in development of PLM strategy :-</p> <ol style="list-style-type: none"> <li>1. Collecting information</li> <li>2. Identifying possible strategies</li> <li>3. Selecting a strategy.</li> <li>4. Communicating the selected strategy.</li> <li>5. Planning the PLM strategy.</li> </ol> <p style="text-align: right;">Exp. 5 steps x 2 = 10 ✓</p>	
b	<p>Basic components of product data management :-</p> <ol style="list-style-type: none"> <li>1. Electronic vaults or data repositories</li> <li>2. A set of user functions</li> <li>3. A set of utility functions</li> <li>4. Interfaces</li> </ol> <p style="text-align: right;">Exp. as 5 components x 2 = 10 ✓</p>	

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17 ME 835

Question Number	Solution	Marks Allocated
3a	<p>Good product design :-</p> <p>Benefits:-</p> <ol style="list-style-type: none"> <li>1. Attracts more customers thereby giving an organization a credit well above other competitors.</li> <li>2. Replaces obsolete designs</li> </ol> <p>Any 5 benefits x1 = 5 ✓</p> <p>Objectives:-</p> <ol style="list-style-type: none"> <li>1. Satisfy customer needs and expectations &amp; maximize the value for the customer at min. cost</li> </ol> <p>Ans 5 x 1 = 5 ✓</p>	
b.	<p><u>C.E.</u> : It is a method of designing &amp; developing products in which the different stages run simultaneously or work at the same time, rather than sequentially. It aims at a full harmonization between the increase in product quality and the reduction in development times and costs through structuring of product development that involves a large design team conducting simultaneous &amp; interconnected analysis and synthesis actions in relation to all the phases of development. - 4 ✓</p> <p><u>Advantages</u>:-</p> <ol style="list-style-type: none"> <li>1. Reduces product design and development time, limits product design, thereby allowing products to reach customers in less time &amp; at less cost.</li> </ol> <p>Any 6 advantages x1 = 6 ✓</p>	
4a	<p><del>APD</del> :- Steps in product design process :-</p> <ol style="list-style-type: none"> <li>1. Concept generation</li> <li>2. Concept screening</li> <li>3. Feasibility study</li> <li>4. Preliminary design</li> <li>5. Design evaluation &amp; improvement</li> <li>6. Building prototype</li> <li>7. Executing final design.</li> </ol> <p>Brief exp. of 7 steps x 1 = 7 ✓</p>	

Question Number	Solution	Marks Allocated
4b.	<p><u>product recycling</u> :- It is a process by which product materials destined for disposal are collected, processed and remanufactured into new products. The process aims to recover the raw materials from used products in order to conserve the value of the raw material.</p> <p><u>Benefits</u> :- Recycling</p> <ol style="list-style-type: none"> <li>1. Saves energy</li> <li>2. Saves natural resources</li> <li>3. Helps protect the environment</li> <li>4. Can generate more revenues</li> <li>5. Enhances business reputation.</li> </ol>	<p>- 3 ✓</p> <p>5 points x 2 = 10 ✓</p>
5a	<p><u>NPD</u> :- It refers to all the activities involved in developing a new product or service, right from its initial conceptual stage to its introduction to the market.</p> <p><u>Need for NPD</u> :-</p> <ol style="list-style-type: none"> <li>1. Changes in market</li> <li>2. Changes in technology</li> <li>3. Increase in competition</li> <li>4. Diversification of risk</li> <li>5. Reputation and good will</li> <li>6. Seasonal fluctuations</li> </ol>	<p>- 2 ✓</p> <p>Explains any 4 x 2 = 8 ✓</p>
b.	<p><u>Steps in NPD</u> :-</p> <ol style="list-style-type: none"> <li>1. Idea generation &amp; screening</li> <li>2. Conceptual design &amp; testing</li> <li>3. Design analysis</li> <li>4. Business strategy</li> <li>5. Market Survey</li> <li>6. Product development &amp; moving into market</li> </ol>	<p>- 10 ✓</p> <p>Explains 6 points - 10 ✓</p>
6a	<p><u>steps in structuring new product development</u> :-</p> <ol style="list-style-type: none"> <li>1. Idea generation : Internal sources, SWOT analysis, market research, customers.</li> <li>2. Idea screening</li> <li>3. Concept development &amp; testing</li> <li>4. Business strategy analysis.</li> </ol>	<p>- 14 ✓</p> <p>Exp. 7 steps x 2 = 14 ✓</p>

Subject Title :

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Question Number	Solution	Marks Allocated
6b	<p>Decisions Support System:-</p> <ol style="list-style-type: none"> <li>1. It should not be used to make automatic decisions, instead assist and encourage people in an effective decisions making process.</li> <li>2. Must provide support for both individual &amp; group of decision makers.</li> </ol> <p style="text-align: center;">⋮</p>	<p style="text-align: right;">6 * points * 1 = 6 ✓</p>
7a	<p><u>Technological change</u>:- It is defined as an increase in the efficiency of physical process, product, materials, machinery or equipment, which results in an increase in the output, without an increase in the input.</p> <p>Examples:- Mobile phone, Advanced cutting tools, Automates &amp; process</p> <p><u>Impact on Society</u>:-</p> <ol style="list-style-type: none"> <li>1. Different products with different features and characteristics like superior in quality, free from pollution, safer, more comfortable, etc. enter into the market in a short span of time.</li> </ol> <p style="text-align: center;">⋮</p>	<p style="text-align: right;">- 3 ✓</p> <p style="text-align: right;">- 2 ✓</p> <p style="text-align: right;">5 impacts * 1 = 5 ✓</p>
b.	<p>Technology forecasting methods:-</p> <p><u>Brain storming</u>:- It is a method, involves a group of people under a leader who encourages forecasting about a specific technology by collecting all the ideas spontaneously. Every idea however absurd it may look, is given due consideration.</p> <p style="text-align: center;">⋮</p> <p>Delphi technique</p> <p>Scenario writing</p>	<p style="text-align: right;">- 4</p> <p style="text-align: right;">- 3</p> <p style="text-align: right;">- 3 -</p>

Question Number	Solution	Marks Allocated
8 a	<p><u>Technology forecasting</u> :- It is a planning tool or technique, applied to predict the following :-</p> <ol style="list-style-type: none"> <li>1. The potential directions at which technology change is taking place</li> <li>2. The rate of technology advance</li> <li>3. The effects of technological change on process, products, market, society.</li> </ol> <p><u>Reasons</u> :-</p> <ol style="list-style-type: none"> <li>1. Increased competition in the global market for innovative and cost competitive products. It helps to incorporate technological changes into strategic planning process.</li> </ol>	<p>- 3</p> <p>5 points x 1 = 5 ✓</p>
8 b	<p><u>Relevance tree technique</u> :-</p> <p>objective → Air pollutant control</p> <p>Note :- Any other example is acceptable.</p>	<p>Sketch - 8 ✓ Brief explanation - 4 ✓</p>
9 a	<p><u>Virtual product development</u> :- It refers to the working and analyzing techniques, processes and methods for product development in a virtual environment, which is created using advanced computer technology. A virtual product is completely a digital product representation created in computer based environments.</p>	<p>- 2 ✓</p>

9(a) Benefits

Contd.

1. Helps in evaluating alternate design concepts, perform multiple product tests, and prepare manufacturing tools and processes, without having to build, test and subsequently destroy expensive physical prototypes.

8 points x 1 = 8 ✓

9(b) 3D CAD system:-

Brief explanation of the above

2 ✓

Benefits:-

1. Increase in design quality and accuracy
2. Sharing of 3D CAD data

Ans 8 benefits x 1 = 8 ✓

10 a. Product data technology:- It includes all aspects of the definitions and methods of processing of data information related to a product, through out its development and operational life cycle.

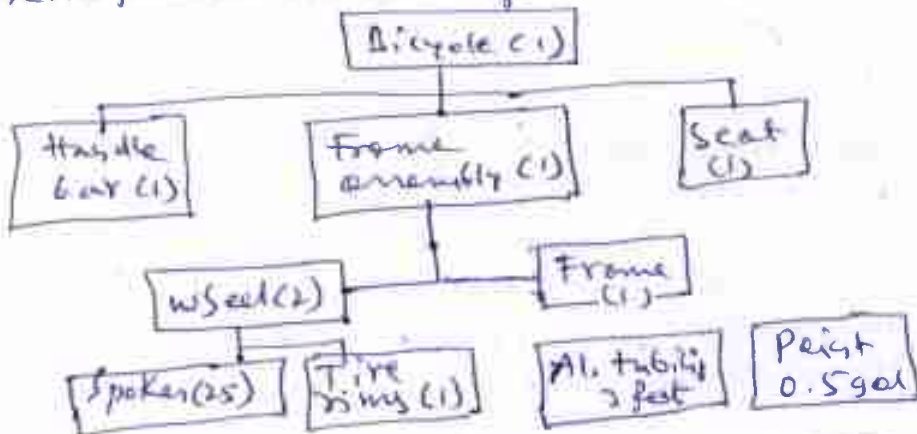
2 ✓

Classification of product data:-

1. Product defining data
2. Product descriptive data
3. Geometry data
4. Data on development process
5. Product configurational data
6. Meta data

Ans 6 x 2 = 12 ✓

b. Generic product structure of a bicycle:-



Sketch - 8  
Brief exp. - 2

10 ✓