

CENTRAL POLYTECHNIC COLLEGE, THARAMANI – 600113.

(An Autonomous Institution)

**DEPARTMENT  
OF  
MECHANICAL ENGINEERING (CAD)**



*Question Bank – APRIL 2026*

***EMC61016 – PRODUCT LIFECYCLE MANAGEMENT***



U.N O	Q NO	QUESTIONS
1	1	<p>PLM supports concurrent engineering mainly through</p> <p>(a) Sequential design (b) Manual updates</p> <p>(c) Paper drawings (d) Shared real-time product data</p> <p><b>Ans: Shared real-time product data</b></p>
1	2	<p>PLM stands for</p> <p>(a) Product Line Management (b) Product Lifecycle Management</p> <p>(c) Process Lifecycle Management (d) Production Logistics Management</p> <p><b>Ans: Product Lifecycle Management</b></p>
1	3	<p>If frequent design errors occur across departments, the best solution is</p> <p>(a) CRM (b) SCM</p> <p>(c) PLM implementation (d) Payroll system</p> <p><b>Ans: PLM implementation</b></p>
1	4	<p>PDM primarily manages</p> <p>(a) Engineering and product data (b) Marketing data</p> <p>(c) Financial data (d) HR data</p> <p><b>Ans: Engineering and product data</b></p>
1	5	<p>Central data repository in PLM helps to</p> <p>(a) Increase duplication (b) Delay access</p> <p>(c) Restrict collaboration (d) Reuse existing product data</p> <p><b>Ans: Reuse existing product data</b></p>
1	6	<p>Heterogeneous data sources indicate</p> <p>(a) Same data format (b) Manual records</p> <p>(c) Different platforms and formats (d) Paper documents</p> <p><b>Ans: Different platforms and formats</b></p>
1	7	<p>Engineering change management is best handled using</p> <p>(a) Emails (b) Spreadsheets</p> <p>(c) Manual forms (d) PLM workflow</p> <p><b>Ans: PLM workflow</b></p>
1	8	<p>The main objective of PLM is to</p> <p>(a) Improve payroll (b) Increase manpower</p> <p>(c) Manage product data across lifecycle (d) Reduce machines</p> <p><b>Ans: Manage product data across lifecycle</b></p>
1	9	<p>Which factor most affects PLM success?</p> <p>(a) Software interface (b) Vendor brand</p> <p>(c) Hardware speed (d) Organizational readiness</p> <p><b>Ans: Organizational readiness</b></p>
1	10	<p>Version control in PLM is used to</p> <p>(a) Increase file size (b) Avoid data inconsistency</p> <p>(c) Reduce speed (d) Increase storage</p> <p><b>Ans: Avoid data inconsistency</b></p>

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QUESTIONS

- 1 11 EDM refers to  
 (a) Enterprise Data Model (b) Electronic Design Model  
 (c) Engineering Data Management (d) Engineering Decision Model  
**Ans: Engineering Data Management**
- 1 12 A PLM roadmap should primarily align with  
 (a) Business strategy (b) Hardware list  
 (c) CAD tools (d) Drawing standards  
**Ans: Business strategy**
- 1 13 If Engineering BOM and Manufacturing BOM do not match, it indicates  
 (a) CAD error (b) ERP issue  
 (c) Poor PLM integration (d) SCM failure  
**Ans: Poor PLM integration**
- 1 14 PLM infrastructure includes  
 (a) People, process and technology (b) Only hardware  
 (c) Only software (d) Only databases  
**Ans: People, process and technology**
- 1 15 PLM differs from standalone CAD because PLM provides  
 (a) Drafting (b) Modeling  
 (c) Sketching (d) Lifecycle data traceability  
**Ans: Lifecycle data traceability**
- 1 16 CPDM expands as  
 (a) Central Product Data Management (b) Collaborative Product Definition Management  
 (c) Computer Product Development Model (d) Corporate Product Design  
**Ans: Collaborative Product Definition Management**
- 1 17 Resistance to PLM implementation mainly arises due to  
 (a) Technology issues (b) Cost  
 (c) Change management problems (d) Software bugs  
**Ans: Change management problems**
- 1 18 Integrating PLM with ERP creates  
 (a) Isolated data (b) Manual reports  
 (c) Data duplication (d) End-to-end product visibility  
**Ans: End-to-end product visibility**
- 1 19 Which is NOT a PLM component?  
 (a) Workflow management (b) Collaboration tools  
 (c) Payroll system (d) Data management  
**Ans: Payroll system**
- 1 20 PLM feasibility study should evaluate  
 (a) Software brand (b) Training only  
 (c) Office size (d) Technical and economic viability  
**Ans: Technical and economic viability**

U.N O	Q NO	QUESTIONS	
1	21	Business view of PLM focuses on (a) Value creation and profitability (c) CAD tools	(b) Databases (d) Networks <b>Ans: Value creation and profitability</b>
1	22	PLM reduces rework mainly by (a) Increasing manpower (c) Ensuring data consistency	(b) Redesigning parts (d) Increasing cost <b>Ans: Ensuring data consistency</b>
1	23	Real-time collaboration in PLM is enabled by (a) Offline tools (c) Local files	(b) Network and communication systems (d) Paper drawings <b>Ans: Network and communication systems</b>
1	24	CPC stands for (a) Central Process Control (c) Collaborative Product Commerce	(b) Concurrent Product Creation (d) Computer Process Control <b>Ans: Collaborative Product Commerce</b>
1	25	Best measure of PLM effectiveness is (a) Number of users (c) File size	(b) License cost (d) Process performance improvement <b>Ans: Process performance improvement</b>
1	26	PLM enables innovation mainly through (a) Data isolation (c) Knowledge reuse	(b) Restricting access (d) Manual control <b>Ans: Knowledge reuse</b>
1	27	Designing a single source of truth in PLM requires (a) Multiple databases (c) Paper files	(b) Centralized data management (d) Manual updates <b>Ans: Centralized data management</b>
1	28	Which feature helps ensure compliance in PLM? (a) Guessing (c) Informal updates	(b) Manual checks (d) Controlled workflows <b>Ans: Controlled workflows</b>
1	29	PLM data is useful during (a) Design only (c) Service only	(b) Manufacturing only (d) All lifecycle stages <b>Ans: All lifecycle stages</b>
1	30	Product traceability in PLM improves (a) Confusion (c) Decision making	(b) Delay (d) Rework <b>Ans: Decision making</b>

U.N O	Q NO	QUESTIONS	
1	31	PDM is best described as (a) Engineering data backbone (c) Marketing tool	(b) Financial system (d) HR system
		<b>Ans: Engineering data backbone</b>	
1	32	PLM implementation should begin with (a) Software purchase (c) Data migration	(b) Process analysis and redesign (d) Training
		<b>Ans: Process analysis and redesign</b>	
1	33	Which PLM benefit justifies high investment? (a) Hardware speed (c) Reduced time-to-market	(b) Software UI (d) Office size
		<b>Ans: Reduced time-to-market</b>	
1	34	PLM supports decision making by providing (a) Guesswork (c) Trial and error	(b) Experience only (d) Accurate product information
		<b>Ans: Accurate product information</b>	
1	35	Heterogeneous data issues arise mainly due to (a) Standardization (c) Multiple systems and formats	(b) Single database (d) Version control
		<b>Ans: Multiple systems and formats</b>	
1	36	Change impact analysis is supported by (a) CRM (c) PLM	(b) SCM (d) HRM
		<b>Ans: PLM</b>	
1	37	Lifecycle cost reduction is best achieved by (a) Late changes (c) Trial methods	(b) Rework (d) Early design decisions using PLM
		<b>Ans: Early design decisions using PLM</b>	
1	38	PLM ensures data security through (a) Open access (c) No control	(b) Access rights and roles (d) Duplication
		<b>Ans: Access rights and roles</b>	
1	39	Digital product definition is created using (a) Manual drawings (c) PLM and CAD integration	(b) Physical models (d) Paper files
		<b>Ans: PLM and CAD integration</b>	
1	40	PLM supports collaboration across locations using (a) Standalone CAD (c) Network-based PLM systems	(b) Local servers (d) Paper files
		<b>Ans: Network-based PLM systems</b>	

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QUESTIONS

- 1 41 Which phase initiates the product lifecycle?  
 (a) Manufacturing (b) Concept  
 (c) Service (d) Disposal  
**Ans: Concept**
- 1 42 PLM improves customer satisfaction by  
 (a) Delaying service (b) Delivering better products faster  
 (c) Increasing paperwork (d) Higher cost  
**Ans: Delivering better products faster**
- 1 43 PLM implementation without training results in  
 (a) Fast adoption (b) High efficiency  
 (c) User inefficiency (d) Knowledge reuse  
**Ans: User inefficiency**
- 1 44 PLM reduces errors mainly through  
 (a) Manual checks (b) Guessing  
 (c) Isolation (d) Standardization of data and processes  
**Ans: Standardization of data and processes**
- 1 45 Engineering BOM is controlled using  
 (a) CRM (b) SCM  
 (c) PDM system (d) HRM  
**Ans: PDM system**
- 1 46 PLM enables compliance with standards by  
 (a) Ignoring rules (b) Automated workflows  
 (c) Manual verification (d) Informal updates  
**Ans: Automated workflows**
- 1 47 PLM supports future product development by  
 (a) Deleting old data (b) Isolating data  
 (c) Manual storage (d) Storing historical product knowledge  
**Ans: Storing historical product knowledge**
- 1 48 The major barrier to PLM implementation is  
 (a) Resistance to organizational change (b) Hardware failure  
 (c) Software cost (d) Data reuse  
**Ans: Resistance to organizational change**
- 1 49 PLM improves interoperability by  
 (a) Duplication (b) Standardized data models  
 (c) Isolation (d) Manual entry  
**Ans: Standardized data models**
- 1 50 PLM is best described as  
 (a) Strategic business approach supported by IT (b) Hardware only  
 (c) Software only (d) Database  
**Ans: Strategic business approach supported by IT**

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QUESTIONS

- 2 1 Engineering design primarily aims to  
(a) Reduce cost only (b) Improve aesthetics  
(c) Solve technical problems systematically (d) Increase production speed  
**Ans: Solve technical problems systematically**
- 2 2 Organization in product design refers to  
(a) Product layout (b) Team and workflow structuring  
(c) Cost estimation (d) Material selection  
**Ans: Team and workflow structuring**
- 2 3 Decomposition in product design means  
(a) Breaking product into subsystems (b) Manufacturing sequencing  
(c) Cost breakdown (d) Market segmentation  
**Ans: Breaking product into subsystems**
- 2 4 Functional decomposition focuses on  
(a) Shape of parts (b) Cost of parts  
(c) Functions performed (d) Manufacturing time  
**Ans: Functions performed**
- 2 5 Which phase comes first in product design process?  
(a) Concept generation (b) Problem identification  
(c) Detailed design (d) Testing  
**Ans: Problem identification**
- 2 6 Methodical evolution in product design emphasizes  
(a) Random creativity (b) Trial-and-error  
(c) Systematic improvement methods (d) Reverse engineering  
**Ans: Systematic improvement methods**
- 2 7 Pugh's concept selection matrix is used in  
(a) Manufacturing (b) Concept evaluation  
(c) Quality inspection (d) Cost control  
**Ans: Concept evaluation**
- 2 8 Concurrent engineering mainly reduces  
(a) Product quality (b) Design errors  
(c) Development time (d) Customer involvement  
**Ans: Development time**
- 2 9 Concurrent engineering integrates  
(a) Design only (b) Design and marketing  
(c) Design, manufacturing & support (d) Manufacturing only  
**Ans: Design, manufacturing & support**
- 2 10 Main advantage of concurrent engineering is  
(a) Higher inventory (b) Faster time-to-market  
(c) Increased documentation (d) More iterations  
**Ans: Faster time-to-market**

U.N O	Q NO	QUESTIONS	
2	11	Design for X (DfX) refers to (a) Design for aesthetics (c) Design for marketing <b>Ans: Design for specific objectives</b>	(b) Design for specific objectives (d) Design for cost only
2	12	Design for Manufacturing (DFM) aims to (a) Reduce weight (c) Improve appearance <b>Ans: Simplify production</b>	(b) Simplify production (d) Increase variety
2	13	Design for Assembly (DFA) reduces (a) Assembly time (c) Material usage <b>Ans: Assembly time</b>	(b) Product life (d) Energy consumption
2	14	Design for Environment focuses on (a) Cost (c) Environmental impact <b>Ans: Environmental impact</b>	(b) Aesthetics (d) Speed
2	15	Design-centric development model emphasizes (a) Manufacturing dominance (c) Marketing dominance <b>Ans: Design-led decision making</b>	(b) Design-led decision making (d) Cost dominance
2	16	Design-centric model is most useful for (a) Commodity products (c) Low-cost items <b>Ans: Innovative products</b>	(b) Innovative products (d) Mass production
2	17	End-of-life (EOL) strategy includes (a) Product launch (c) Concept design <b>Ans: Recycling</b>	(b) Recycling (d) Prototyping
2	18	Recovery at end-of-life includes (a) Remanufacturing (c) Branding <b>Ans: Remanufacturing</b>	(b) Packaging (d) Distribution
2	19	Recycling mainly aims to (a) Increase profit (c) Improve strength <b>Ans: Reduce waste</b>	(b) Reduce waste (d) Improve speed
2	20	Which is a 12R recovery strategy? (a) Recycle (c) Refurbish <b>Ans: All of the above</b>	(b) Repair (d) All of the above

U.N O	Q NO	QUESTIONS	
2	21	Human factors in design focus on (a) Machine performance (c) Cost control <b>Ans: User interaction</b>	(b) User interaction (d) Automation
2	22	Ergonomics primarily improves (a) Aesthetics (c) Cost <b>Ans: User comfort &amp; safety</b>	(b) User comfort & safety (d) Manufacturing speed
2	23	Poor human factor design results in (a) Higher usability (c) Better performance <b>Ans: User errors</b>	(b) User errors (d) Lower fatigue
2	24	Modeling in product design is used to (a) Replace testing (c) Increase cost <b>Ans: Visualize and analyze designs</b>	(b) Visualize and analyze designs (d) Avoid prototyping
2	25	Simulation helps in (a) Predicting behavior (c) Avoiding design <b>Ans: Predicting behavior</b>	(b) Increasing weight (d) Increasing complexity
2	26	CAD models mainly support (a) Marketing (c) Distribution <b>Ans: Design representation</b>	(b) Design representation (d) Quality audit
2	27	Finite Element Analysis is a type of (a) Physical testing (c) Manual analysis <b>Ans: Numerical simulation</b>	(b) Numerical simulation (d) Market analysis
2	28	Simulation reduces (a) Design confidence (c) Product life <b>Ans: Prototyping cost</b>	(b) Prototyping cost (d) User satisfaction
2	29	Iterative design means (a) One-time design (c) Final design <b>Ans: Repeated refinement</b>	(b) Repeated refinement (d) Rapid design
2	30	Design reviews are conducted to (a) Delay project (c) Increase cost <b>Ans: Identify issues</b>	(b) Identify issues (d) Finish early

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QUESTIONS

- 2 31 Concurrent engineering requires  
 (a) Sequential teams (b) Cross-functional teams  
 (c) Single designer (d) Outsourcing only  
**Ans: Cross-functional teams**
- 2 32 Design for Serviceability focuses on  
 (a) Assembly (b) Maintenance ease  
 (c) Weight (d) Packaging  
**Ans: Maintenance ease**
- 2 33 Remanufacturing differs from recycling because it  
 (a) Destroys product (b) Restores function  
 (c) Increases waste (d) Reduces quality  
**Ans: Restores function**
- 2 34 Anthropometric data is used for  
 (a) Cost estimation (b) Human dimension design  
 (c) Material selection (d) Tolerance design  
**Ans: Human dimension design**
- 2 35 Digital mock-up is a  
 (a) Physical prototype (b) Virtual model  
 (c) Marketing tool (d) Test rig  
**Ans: Virtual model**
- 2 36 Concept screening removes  
 (a) Good concepts (b) Weak concepts  
 (c) Final design (d) Requirements  
**Ans: Weak concepts**
- 2 37 Design synthesis involves  
 (a) Problem definition (b) Solution generation  
 (c) Testing (d) Disposal  
**Ans: Solution generation**
- 2 38 Concurrent engineering increases  
 (a) Rework (b) Communication  
 (c) Development cost (d) Delay  
**Ans: Communication**
- 2 39 Design for Quality aims to  
 (a) Reduce defects (b) Increase cost  
 (c) Increase weight (d) Increase steps  
**Ans: Reduce defects**
- 2 40 Sustainable product design considers  
 (a) Profit only (b) Entire lifecycle  
 (c) Manufacturing only (d) Marketing only  
**Ans: Entire lifecycle**

U.N O	Q NO	QUESTIONS	
2	41	User-centered design starts with (a) Technology (c) Manufacturing <b>Ans: User needs</b>	(b) User needs (d) Cost
2	42	Simulation is most useful during (a) Disposal (c) Marketing <b>Ans: Early design</b>	(b) Early design (d) Packaging
2	43	Design validation ensures (a) Design meets needs (c) Design is fast <b>Ans: Design meets needs</b>	(b) Design is cheap (d) Design is complex
2	44	Design for Cost targets (a) Lower quality (c) High performance only <b>Ans: Optimal value</b>	(b) Optimal value (d) High complexity
2	45	Which tool supports concurrent engineering? (a) Gantt chart (c) Manual drawing <b>Ans: PLM systems</b>	(b) PLM systems (d) Ledger
2	46	Product take-back systems support (a) Marketing (c) Branding <b>Ans: Recycling</b>	(b) Recycling (d) Testing
2	47	Cognitive ergonomics deals with (a) Physical strain (c) Posture <b>Ans: Mental workload</b>	(b) Mental workload (d) Reach
2	48	Virtual prototyping mainly reduces (a) Innovation (c) Creativity <b>Ans: Physical prototypes</b>	(b) Physical prototypes (d) Functionality
2	49	Gate reviews occur between (a) Design steps (c) Marketing steps <b>Ans: Design steps</b>	(b) Manufacturing steps (d) Distribution steps
2	50	Best design approach for complex products is (a) Linear design (c) Random design <b>Ans: Methodical design</b>	(b) Methodical design (d) Copying

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QUESTIONS

- 3 1 New Product Development (NPD) primarily focuses on  
 (a) Cost reduction (b) Developing modified or new products  
 (c) Marketing only (d) Manufacturing only  
**Ans: Developing modified or new products**
- 3 2 Which is the first stage of NPD process?  
 (a) Concept testing (b) Idea generation  
 (c) Product launch (d) Commercialization  
**Ans: Idea generation**
- 3 3 Structuring NPD mainly involves  
 (a) Random activities (b) Organizing tasks and responsibilities  
 (c) Only budgeting (d) Only scheduling  
**Ans: Organizing tasks and responsibilities**
- 3 4 Cross-functional teams are important in NPD because they  
 (a) Increase cost (b) Reduce coordination  
 (c) Improve integration (d) Delay decisions  
**Ans: Improve integration**
- 3 5 Decision Support System (DSS) in NPD helps in  
 (a) Product assembly (b) Decision making using data  
 (c) Manufacturing only (d) Advertising  
**Ans: Decision making using data**
- 3 6 DSS mainly supports  
 (a) Structured decisions (b) Unstructured decisions  
 (c) Manual decisions (d) Routine tasks  
**Ans: Unstructured decisions**
- 3 7 Market data analysis is part of  
 (a) DSS (b) CAD  
 (c) CAM (d) ERP  
**Ans: DSS**
- 3 8 Estimating market opportunity involves  
 (a) Cost calculation (b) Demand forecasting  
 (c) Material selection (d) Process planning  
**Ans: Demand forecasting**
- 3 9 Which tool is used for market opportunity estimation?  
 (a) SWOT analysis (b) FEA  
 (c) DFA (d) CPM  
**Ans: SWOT analysis**
- 3 10 Market segmentation helps in  
 (a) Increasing production (b) Targeting customers  
 (c) Reducing quality (d) Increasing inventory  
**Ans: Targeting customers**

U.N O	Q NO	QUESTIONS	
3	11	New product financial control focuses on (a) Profit tracking (c) Product color <b>Ans: Profit tracking</b>	(b) Design creativity (d) Packaging
3	12	Break-even analysis is used to (a) Estimate demand (c) Decide profitability <b>Ans: Decide profitability</b>	(b) Control cost (d) Improve quality
3	13	Cash flow analysis helps in (a) Design validation (c) Product testing <b>Ans: Financial feasibility</b>	(b) Financial feasibility (d) Market survey
3	14	Implementing NPD mainly involves (a) Idea screening (c) Market research <b>Ans: Converting plans into action</b>	(b) Converting plans into action (d) Concept generation
3	15	Poor implementation of NPD results in (a) High success (c) Better design <b>Ans: Market failure</b>	(b) Market failure (d) Reduced cost
3	16	Market entry decision determines (a) When and how to enter market (c) Material type <b>Ans: When and how to enter market</b>	(b) Product color (d) Assembly method
3	17	Early market entry provides (a) High risk only (c) No benefit <b>Ans: Competitive advantage</b>	(b) Competitive advantage (d) High cost only
3	18	Late market entry mainly reduces (a) Cost (c) Competition <b>Ans: Risk</b>	(b) Risk (d) Quality
3	19	Product launch involves (a) Concept testing (c) Design phase <b>Ans: Market introduction</b>	(b) Market introduction (d) Cost estimation
3	20	Tracking new product performance includes (a) Monitoring sales (c) Design changes <b>Ans: Monitoring sales</b>	(b) Manufacturing (d) Prototyping

U.N O	Q NO	QUESTIONS	
3	21	Key performance indicator (KPI) in product tracking is (a) Color (c) Shape	(b) Sales volume (d) Size
		<b>Ans: Sales volume</b>	
3	22	Customer feedback after launch is used for (a) Ignoring issues (c) Cost increase	(b) Product improvement (d) Market exit
		<b>Ans: Product improvement</b>	
3	23	Product redesign is mainly done to (a) Reduce cost (c) Increase waste	(b) Improve performance (d) Avoid competition
		<b>Ans: Improve performance</b>	
3	24	Redesign based on customer feedback is (a) Reactive redesign (c) Random redesign	(b) Proactive redesign (d) Forced redesign
		<b>Ans: Reactive redesign</b>	
3	25	Value engineering is related to (a) Redesign (c) Packaging	(b) Marketing (d) Distribution
		<b>Ans: Redesign</b>	
3	26	Stage-gate process controls (a) Manufacturing (c) Marketing	(b) Decision points (d) Quality inspection
		<b>Ans: Decision points</b>	
3	27	Idea screening removes (a) Weak ideas (c) Final design	(b) Strong ideas (d) Market data
		<b>Ans: Weak ideas</b>	
3	28	DSS improves NPD by reducing (a) Information overload (c) Innovation	(b) Creativity (d) Accuracy
		<b>Ans: Information overload</b>	
3	29	Forecasting demand is an example of (a) Strategic decision (c) Operational decision	(b) Tactical decision (d) Random decision
		<b>Ans: Strategic decision</b>	
3	30	ROI is used to measure (a) Quality (c) Time	(b) Profitability (d) Risk
		<b>Ans: Profitability</b>	

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QUESTIONS

- 3 31 Successful NPD implementation requires  
 (a) Strong leadership (b) High cost  
 (c) Large inventory (d) Late launch  
**Ans: Strong leadership**
- 3 32 Licensing as market entry strategy reduces  
 (a) Control (b) Risk  
 (c) Revenue (d) Market reach  
**Ans: Risk**
- 3 33 Trial marketing is conducted to  
 (a) Launch product fully (b) Test market response  
 (c) Increase cost (d) Stop production  
**Ans: Test market response**
- 3 34 Modular redesign mainly improves  
 (a) Flexibility (b) Weight  
 (c) Color (d) Cost only  
**Ans: Flexibility**
- 3 35 Customer involvement in NPD improves  
 (a) Risk (b) Acceptance  
 (c) Cost (d) Delay  
**Ans: Acceptance**
- 3 36 DSS uses which data source?  
 (a) Intuition (b) Historical data  
 (c) Guessing (d) Random input  
**Ans: Historical data**
- 3 37 Market potential refers to  
 (a) Existing sales (b) Maximum possible demand  
 (c) Production capacity (d) Profit margin  
**Ans: Maximum possible demand**
- 3 38 Cost overrun affects  
 (a) Schedule only (b) Financial viability  
 (c) Quality only (d) Design only  
**Ans: Financial viability**
- 3 39 Pilot production helps in  
 (a) Mass launch (b) Process validation  
 (c) Idea generation (d) Marketing  
**Ans: Process validation**
- 3 40 Joint venture as entry strategy shares  
 (a) Risk and resources (b) Profit only  
 (c) Control only (d) Loss only  
**Ans: Risk and resources**

U.N O	Q NO	QUESTIONS	
3	41	Product life cycle tracking identifies (a) Market trends (c) Material defects <b>Ans: Market trends</b>	(b) Design errors (d) Assembly issues
3	42	Cost-driven redesign aims to (a) Increase features (c) Increase weight <b>Ans: Reduce cost</b>	(b) Reduce cost (d) Increase complexity
3	43	Portfolio management in NPD balances (a) Risk and return (c) Cost and size <b>Ans: Risk and return</b>	(b) Design and color (d) Time and motion
3	44	Sensitivity analysis is used to (a) Predict failures (c) Increase cost <b>Ans: Test assumptions</b>	(b) Test assumptions (d) Reduce quality
3	45	Market research data is mostly (a) Qualitative (c) Both <b>Ans: Both</b>	(b) Quantitative (d) Irrelevant
3	46	Budget control ensures (a) Unlimited spending (c) Higher quality <b>Ans: Cost discipline</b>	(b) Cost discipline (d) Faster launch
3	47	Change management is important during (a) Design only (c) Marketing only <b>Ans: NPD implementation</b>	(b) NPD implementation (d) Disposal
3	48	Post-launch review focuses on (a) Profit only (c) Design only <b>Ans: Overall performance</b>	(b) Overall performance (d) Manufacturing only
3	49	Radical redesign differs from incremental redesign by (a) Small changes (c) Cost reduction <b>Ans: Major changes</b>	(b) Major changes (d) Time saving
3	50	Best indicator of NPD success is (a) Design quality (c) Cost <b>Ans: Market acceptance</b>	(b) Market acceptance (d) Technology

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QUESTIONS

- 4 1 Technological change refers to  
 (a) Change in management (b) Advancement in technology over time  
 (c) Change in market (d) Change in cost  
**Ans: Advancement in technology over time**
- 4 2 The main driver of technological change is  
 (a) Customer complaints (b) Innovation  
 (c) Government policy (d) Competition only  
**Ans: Innovation**
- 4 3 Incremental technological change involves  
 (a) Radical innovation (b) Small continuous improvements  
 (c) Total replacement (d) Disruptive change  
**Ans: Small continuous improvements**
- 4 4 Radical technological change leads to  
 (a) Minor upgrades (b) New technology paradigms  
 (c) Cost reduction only (d) Design optimization  
**Ans: New technology paradigms**
- 4 5 Technology forecasting is used to  
 (a) Predict future technology trends (b) Reduce manufacturing cost  
 (c) Improve aesthetics (d) Increase production  
**Ans: Predict future technology trends**
- 4 6 The main purpose of technology forecasting is  
 (a) Risk elimination (b) Strategic planning  
 (c) Marketing (d) Cost control  
**Ans: Strategic planning**
- 4 7 Which is a qualitative forecasting method?  
 (a) Trend extrapolation (b) Delphi method  
 (c) Regression analysis (d) Simulation  
**Ans: Delphi method**
- 4 8 Quantitative forecasting mainly uses  
 (a) Opinions (b) Historical data  
 (c) Guessing (d) Intuition  
**Ans: Historical data**
- 4 9 Relevance tree method is used to  
 (a) Generate ideas (b) Break complex goals into sub-goals  
 (c) Reduce cost (d) Test products  
**Ans: Break complex goals into sub-goals**
- 4 10 Relevance trees are mainly used in  
 (a) Technology planning (b) Manufacturing  
 (c) Quality control (d) Marketing  
**Ans: Technology planning**

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QUESTIONS

- 4 11 Morphological analysis helps in  
 (a) Cost reduction (b) Exploring solution combinations  
 (c) Market research (d) Scheduling  
**Ans: Exploring solution combinations**
- 4 12 Morphological matrix consists of  
 (a) Single solution (b) Multiple parameters and alternatives  
 (c) Cost data (d) Time schedules  
**Ans: Multiple parameters and alternatives**
- 4 13 Morphological methods are most useful during  
 (a) Concept generation (b) Production  
 (c) Distribution (d) Disposal  
**Ans: Concept generation**
- 4 14 Flow diagrams in forecasting show  
 (a) Cost breakdown (b) Sequence of events  
 (c) Product geometry (d) Market share  
**Ans: Sequence of events**
- 4 15 Flow diagrams help in  
 (a) Visualizing relationships (b) Increasing complexity  
 (c) Reducing creativity (d) Cost estimation  
**Ans: Visualizing relationships**
- 4 16 Combining technology forecasts improves  
 (a) Accuracy (b) Cost  
 (c) Delay (d) Complexity  
**Ans: Accuracy**
- 4 17 Combining forecasts reduces  
 (a) Reliability (b) Bias  
 (c) Innovation (d) Data  
**Ans: Bias**
- 4 18 Technological product innovation refers to  
 (a) Marketing innovation (b) New or improved technology-based products  
 (c) Cost innovation (d) Process change only  
**Ans: New or improved technology-based products**
- 4 19 Integration of innovation with product development ensures  
 (a) Delays (b) Alignment with business goals  
 (c) Higher cost (d) Lower quality  
**Ans: Alignment with business goals**
- 4 20 Innovation integration mainly improves  
 (a) Market responsiveness (b) Inventory  
 (c) Rework (d) Complexity  
**Ans: Market responsiveness**

U.N O	Q NO	QUESTIONS	
4	21	Business processes in innovation include (a) Idea to commercialization (c) Sales only <b>Ans: Idea to commercialization</b>	(b) Manufacturing only (d) Marketing only
4	22	Cross-functional integration supports (a) Innovation (c) Isolation <b>Ans: Innovation</b>	(b) Delay (d) Rework
4	23	Methods used in innovation depend on (a) Situation (c) Time only <b>Ans: Situation</b>	(b) Cost only (d) Tools only
4	24	Brainstorming is mainly used for (a) Idea generation (c) Scheduling <b>Ans: Idea generation</b>	(b) Cost control (d) Testing
4	25	TRIZ is a tool used for (a) Problem solving (c) Marketing <b>Ans: Problem solving</b>	(b) Costing (d) Scheduling
4	26	QFD mainly translates (a) Customer needs into design requirements (c) Design into sales <b>Ans: Customer needs into design requirements</b>	(b) Cost into profit (d) Ideas into patents
4	27	SWOT analysis supports innovation by (a) Identifying strengths and weaknesses (c) Increasing production <b>Ans: Identifying strengths and weaknesses</b>	(b) Reducing cost (d) Improving quality
4	28	Scenario analysis is a (a) Qualitative forecasting method (c) Cost tool <b>Ans: Qualitative forecasting method</b>	(b) Quantitative method (d) Scheduling tool
4	29	Technological substitution occurs when (a) Old technology replaces new (c) Cost increases <b>Ans: New technology replaces old</b>	(b) New technology replaces old (d) Market shrinks
4	30	Relevance trees support (a) Decision making (c) Packaging <b>Ans: Decision making</b>	(b) Manufacturing (d) Inspection

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QUESTIONS

- 4 31 Morphological methods encourage  
 (a) Single solution (b) Creativity  
 (c) Standardization (d) Cost cutting  
**Ans: Creativity**
- 4 32 Flow diagrams reduce  
 (a) Process clarity (b) Errors  
 (c) Visualization (d) Innovation  
**Ans: Errors**
- 4 33 Technology forecast accuracy improves when  
 (a) One method is used (b) Multiple methods are combined  
 (c) Guessing (d) Intuition only  
**Ans: Multiple methods are combined**
- 4 34 Open innovation emphasizes  
 (a) Internal ideas only (b) External collaboration  
 (c) Secrecy (d) Isolation  
**Ans: External collaboration**
- 4 35 Closed innovation relies on  
 (a) External ideas (b) Internal R&D  
 (c) Customers only (d) Competitors  
**Ans: Internal R&D**
- 4 36 Stage-gate process helps in  
 (a) Innovation control (b) Manufacturing  
 (c) Marketing (d) Packaging  
**Ans: Innovation control**
- 4 37 Design thinking focuses on  
 (a) User needs (b) Cost only  
 (c) Technology only (d) Speed  
**Ans: User needs**
- 4 38 Benchmarking improves innovation by  
 (a) Copying blindly (b) Learning best practices  
 (c) Increasing cost (d) Reducing quality  
**Ans: Learning best practices**
- 4 39 Trend extrapolation assumes  
 (a) Sudden change (b) Continuity of trends  
 (c) Random change (d) No data  
**Ans: Continuity of trends**
- 4 40 Disruptive technology initially targets  
 (a) Mainstream market (b) Niche or low-end market  
 (c) Premium market (d) All markets  
**Ans: Niche or low-end market**

U.N O	Q NO	QUESTIONS	
4	41	Innovation strategy must align with (a) Business strategy (c) Individual ideas <b>Ans: Business strategy</b>	(b) Personal goals (d) Random plans
4	42	Integration reduces (a) Time-to-market (c) Innovation <b>Ans: Time-to-market</b>	(b) Quality (d) Collaboration
4	43	FMEA is mainly used for (a) Risk analysis (c) Cost control <b>Ans: Risk analysis</b>	(b) Idea generation (d) Scheduling
4	44	Expert opinion is central to (a) Delphi method (c) Regression <b>Ans: Delphi method</b>	(b) Trend analysis (d) Simulation
4	45	Technology life cycle includes (a) Introduction, growth, maturity, decline (c) Manufacturing only <b>Ans: Introduction, growth, maturity, decline</b>	(b) Design only (d) Disposal only
4	46	Combining qualitative and quantitative forecasts improves (a) Robustness (c) Delay <b>Ans: Robustness</b>	(b) Cost (d) Bias only
4	47	Continuous innovation is required due to (a) Stable markets (c) Low competition <b>Ans: Rapid technological change</b>	(b) Rapid technological change (d) Fixed demand
4	48	Which tool is best for early innovation stage? (a) Brainstorming (c) FMEA <b>Ans: Brainstorming</b>	(b) SPC (d) Control chart
4	49	Innovation metrics measure (a) Creativity only (c) Design quality <b>Ans: Innovation performance</b>	(b) Innovation performance (d) Cost only
4	50	Successful innovation integration results in (a) Competitive advantage (c) Delay <b>Ans: Competitive advantage</b>	(b) Higher waste (d) Isolation

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QUESTIONS

- 5 1 Virtual product development primarily uses  
 (a) Physical prototypes (b) Digital tools  
 (c) Manual drafting (d) Trial-and-error  
**Ans: Digital tools**
- 5 2 3D CAD systems are mainly used for  
 (a) Cost estimation (b) Geometry modeling  
 (c) Market analysis (d) Scheduling  
**Ans: Geometry modeling**
- 5 3 Digital mock-up (DMU) is a  
 (a) Physical prototype (b) Virtual assembly  
 (c) Market test (d) Cost model  
**Ans: Virtual assembly**
- 5 4 Major advantage of digital mock-up is  
 (a) Higher cost (b) Early interference detection  
 (c) Manual testing (d) Delayed design  
**Ans: Early interference detection**
- 5 5 Model building in VPD refers to  
 (a) Manufacturing (b) Creating digital representations  
 (c) Marketing (d) Inspection  
**Ans: Creating digital representations**
- 5 6 Model analysis is mainly used to  
 (a) Increase weight (b) Evaluate performance  
 (c) Improve aesthetics (d) Reduce creativity  
**Ans: Evaluate performance**
- 5 7 Which analysis predicts stresses and deformation?  
 (a) FMEA (b) FEA  
 (c) DFA (d) QFD  
**Ans: FEA**
- 5 8 Process planning in VPD focuses on  
 (a) Design shape (b) Manufacturing sequence  
 (c) Packaging (d) Marketing  
**Ans: Manufacturing sequence**
- 5 9 Product data technology ensures  
 (a) Data inconsistency (b) Centralized data management  
 (c) Manual records (d) Design isolation  
**Ans: Centralized data management**
- 5 10 Virtual manufacturing mainly reduces  
 (a) Quality (b) Time and cost  
 (c) Innovation (d) Accuracy  
**Ans: Time and cost**

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NO

QUESTIONS

- 5 11 Product structure represents  
 (a) Market demand (b) Hierarchical product breakdown  
 (c) Cost structure (d) Schedule  
**Ans: Hierarchical product breakdown**
- 5 12 Variant management deals with  
 (a) Product disposal (b) Handling product variations  
 (c) Cost control (d) Quality audit  
**Ans: Handling product variations**
- 5 13 Product configuration allows  
 (a) Fixed products (b) Customized products  
 (c) Manual assembly (d) Random design  
**Ans: Customized products**
- 5 14 Material master data includes  
 (a) Customer data (b) Material specifications  
 (c) Market data (d) Financial data  
**Ans: Material specifications**
- 5 15 Product description data mainly contains  
 (a) Geometry and attributes (b) Sales data  
 (c) Supplier data (d) Cost data  
**Ans: Geometry and attributes**
- 5 16 Data models define  
 (a) Data structure and relationships (b) Product cost  
 (c) Process time (d) Market share  
**Ans: Data structure and relationships**
- 5 17 Life cycle of an individual item includes  
 (a) Design to disposal (b) Marketing only  
 (c) Manufacturing only (d) Sales only  
**Ans: Design to disposal**
- 5 18 Status of an item indicates  
 (a) Color (b) Current lifecycle stage  
 (c) Market demand (d) Cost  
**Ans: Current lifecycle stage**
- 5 19 BOM (Bill of Materials) is part of  
 (a) Product structure (b) Marketing plan  
 (c) Quality plan (d) Cost report  
**Ans: Product structure**
- 5 20 Effective variant management reduces  
 (a) Complexity (b) Reuse  
 (c) Efficiency (d) Standardization  
**Ans: Complexity**

U.N O	Q NO	QUESTIONS	
5	21	PLM stands for (a) Product Layout Management (c) Process Level Modeling <b>Ans: Product Lifecycle Management</b>	(b) Product Lifecycle Management (d) Product Logistics Model
5	22	PLM visioning defines (a) Software tools (c) Daily tasks <b>Ans: Long-term goals</b>	(b) Long-term goals (d) Cost only
5	23	PLM strategy aligns PLM with (a) IT only (c) Design only <b>Ans: Business objectives</b>	(b) Business objectives (d) Manufacturing only
5	24	PLM feasibility study evaluates (a) Product quality (c) Design creativity <b>Ans: Technical &amp; economic viability</b>	(b) Technical & economic viability (d) Market demand
5	25	Change management in PLM focuses on (a) Software installation (c) Hardware upgrade <b>Ans: Managing people and processes</b>	(b) Managing people and processes (d) Cost cutting
5	26	Financial justification of PLM uses (a) ROI analysis (c) FEA <b>Ans: ROI analysis</b>	(b) CAD modeling (d) QFD
5	27	A major barrier to PLM implementation is (a) User resistance (c) Data integration <b>Ans: User resistance</b>	(b) High productivity (d) Standardization
5	28	Another barrier to PLM is (a) Clear strategy (c) Strong leadership <b>Ans: High initial cost</b>	(b) High initial cost (d) Skilled users
5	29	Ten-step PLM approach provides (a) Random guidance (c) Marketing plan <b>Ans: Structured implementation</b>	(b) Structured implementation (d) Cost breakdown
5	30	First step in PLM approach is (a) Software purchase (c) Training <b>Ans: Vision definition</b>	(b) Vision definition (d) Data migration

U.N O	Q NO	QUESTIONS	
5	31	PLM improves business performance by (a) Increasing delay (c) Increasing errors <b>Ans: Reducing time-to-market</b>	(b) Reducing time-to-market (d) Isolating teams
5	32	Organizational benefit of PLM is (a) Poor collaboration (c) Increased rework <b>Ans: Improved coordination</b>	(b) Improved coordination (d) Data duplication
5	33	User benefit of PLM includes (a) More paperwork (c) Manual updates <b>Ans: Easy data access</b>	(b) Easy data access (d) Higher errors
5	34	Product benefit of PLM is (a) Lower quality (c) Delayed launch <b>Ans: Improved product consistency</b>	(b) Improved product consistency (d) Increased waste
5	35	PLM improves process performance by (a) Fragmentation (c) Duplication <b>Ans: Standardization</b>	(b) Standardization (d) Isolation
5	36	Digital factory concept supports (a) Virtual plant simulation (c) Physical trials <b>Ans: Virtual plant simulation</b>	(b) Manual planning (d) Market analysis
5	37	Virtual commissioning helps in (a) Late error detection (c) Increasing downtime <b>Ans: Early validation of control logic</b>	(b) Early validation of control logic (d) Manual testing
5	38	Configuration rules ensure (a) Random selection (c) Cost increase <b>Ans: Valid product combinations</b>	(b) Valid product combinations (d) Design errors
5	39	Obsolete item status indicates (a) Active use (c) New design <b>Ans: Discontinued product</b>	(b) Discontinued product (d) Prototype
5	40	PLM integrates which data? (a) CAD only (c) Marketing only <b>Ans: Product, process &amp; lifecycle data</b>	(b) Product, process & lifecycle data (d) Finance only

U.N O	Q NO	QUESTIONS	
5	41	Cloud-based PLM mainly improves (a) Accessibility (c) Cost <b>Ans: Accessibility</b>	(b) Complexity (d) Delay
5	42	Effective PLM reduces (a) Innovation (c) Collaboration <b>Ans: Errors</b>	(b) Errors (d) Transparency
5	43	Change requests in PLM are managed through (a) Informal discussion (c) Guessing <b>Ans: Engineering change management</b>	(b) Engineering change management (d) Manual notes
5	44	Engineering Change Order (ECO) updates (a) Product data (c) Financial data <b>Ans: Product data</b>	(b) Market data (d) HR data
5	45	PLM supports compliance by (a) Ignoring standards (c) Random storage <b>Ans: Traceability</b>	(b) Traceability (d) Data loss
5	46	Long-term PLM benefit is (a) Increased rework (c) Data loss <b>Ans: Knowledge retention</b>	(b) Knowledge retention (d) Isolation
5	47	PLM implementation should be (a) Technology-driven (c) Tool-driven <b>Ans: Business-driven</b>	(b) Business-driven (d) Vendor-driven
5	48	Digital thread concept links (a) Isolated data (c) Marketing data <b>Ans: Lifecycle data continuity</b>	(b) Lifecycle data continuity (d) Cost data only
5	49	PLM maturity improves with (a) Poor governance (c) Data silos <b>Ans: Process discipline</b>	(b) Process discipline (d) Manual control
5	50	Overall goal of PLM is (a) Tool deployment (c) Cost increase <b>Ans: Lifecycle optimization</b>	(b) Lifecycle optimization (d) Design isolation

**UNIT – I**

**PART B** (Short answer questions each question carries 3 marks)

- 1 Discuss the need for PLM.
- 2 Discuss the benefits of PLM to an organization.
- 3 Enumerate the different views of PLM.
- 4 List the major components of a PLM system.
- 5 Describe the phases of Product Lifecycle Management.
- 6 Discuss the significance of PLM feasibility study .
- 7 Write about PLM strategies and their elements.
- 8 Describe the process of identification, selection, and implementation of PLM strategy.
- 9 Describe Product Data Management (PDM) and implementation of PDM systems.
- 10 Discuss the PLM/PDM infrastructure.

**UNIT – II**

**PART B** (Short answer questions each question carries 3 marks)

- 11 Discuss organization and decomposition in product design.
- 12 List the stages of the product design process.
- 13 Write about methodical evolution in product design.
- 14 Discuss the principles of concurrent engineering.
- 15 Write about Design for X with suitable examples.
- 16 Describe the design-centric development model.
- 17 Describe recovery strategies at end-of-life.
- 18 Discuss the importance of recycling in product design.
- 19 Write about the role of human factors in product design.
- 20 Describe the role of modeling and simulation in product development.

**UNIT – III**

**PART B** (Short answer questions each question carries 3 marks)

- 21 List out the stages of New Product Development.
- 22 Discuss the structure of NPD process.
- 23 Describe the role of Decision Support Systems in NPD.
- 24 Discuss methods for estimating market opportunities.
- 25 Discuss financial control techniques for new products.
- 26 Describe implementation issues in NPD.
- 27 Enumerate different market entry strategies.
- 28 Discuss product launch and tracking methods.
- 29 Write about the concept of product redesign.
- 30 Differentiate between incremental and radical redesign.

**UNIT – IV**

**PART C** (Short answer questions each question carries 3 marks)

- 31 Discuss technological change.
- 32 Write about the methods of technology forecasting.
- 33 Describe relevance tree method with example.
- 34 Describe morphological method for technology forecasting.
- 35 Describe the role of flow diagrams in forecasting technologies.
- 36 Discuss the need for combining technology forecasts.
- 37 Discuss integration of technological innovation with product development.
- 38 Describe methods and tools used in the innovation process.
- 39 Write about situation-based selection of innovation tools.
- 40 Discuss the importance of innovation in business processes.

**UNIT – V**

**PART B** (Short answer questions each question carries **3 marks**)

- 41 Discuss virtual product development tools.
- 42 Describe digital mock-up.
- 43 Describe product structure.
- 44 Discuss product configuration.
- 45 Describe lifecycle and status of individual items.
- 46 Discuss PLM strategy.
- 47 Discuss the importance of PLM feasibility study.
- 48 Discuss change management issues in PLM implementation.
- 49 Discuss data model.
- 50 Discuss benefits of PLM .

**UNIT – I**

**PART C** (Explanatory type questions each question carries **10 marks**)

- 1 Explain the phases of Product Lifecycle Management (PLM) .
- 2 Explain the strategies of Product Lifecycle Management (PLM) .
- 3 Define Product Data Management (PDM) and explain how PDM systems are implemented in an organization
- 4 Compare Collaborative Product Definition Management (CPDM) and Collaborative Product Commerce (CPC).
- 5 Explain the infrastructure required for implementing PLM / PDM systems.

**UNIT – II**

**PART C**      (*Explanatory type questions each question carries 10 marks*)

- 6 Explain engineering design in detail.
- 7 Explain the role of methodical evolution in product design with suitable examples.
- 8 Define concurrent engineering and explain how it enhances product development.
- 9 Explain the design-centric development model, highlighting their impact on product performance and lifecycle optimization.
- 10 Enumerate the key strategies required for end-of-life product recovery, recycling, and the integration of human factors in product design

**UNIT – III**

**PART C**      (*Explanatory type questions each question carries 10 marks*)

- 11 Explain New Product Development (NPD) in detail.
- 12 Explain the role of Decision Support Systems (DSS) in New Product Development.
- 13 Explain the methods for estimating market opportunities for a new product.
- 14 Explain the financial management and control of new products.
- 15 Explain the concept of redesign of product.

**UNIT – IV**

**PART C**      (*Explanatory type questions each question carries 10 marks*)

- 16 Explain the types of technological change.
- 17 Explain the methods of technology forecasting with suitable illustrations.
- 18 Explain the need for combining technology forecasts.
- 19 Explain how technological product innovation is integrated into product development.
- 20 Explain the methods and tools used in the innovation process.

**UNIT – V**

**PART C** (*Explanatory type questions each question carries 10 marks*)

- 21 Explain the tools used in virtual product development.
- 22 Explain product structures in detail.
- 23 Explain in detail about PLM visioning and PLM strategy.
- 24 Explain the financial justification of PLM.
- 25 Explain the ten-step approach to implement Product Lifecycle Management (PLM) in an organization