GPCET

G.PULLAIAH COLLEGE OF ENGINEERING AND TECHNOLOGY

II B. Tech II SEM MID-I Examinations FEB/MARCH-2025 Branch: Common to CE | NAE / ECE | CAI (Autonomous)

Date: 06-03-2025 Max Marks: 30M

Sub: Design Thinking and Innovation

Time: 1Hr 30Min

Answer all the Questions

9	٥	7				4	`	<u>`</u> \	`	2			
Explain History and Features of Design Thinking?	MARKS: 10	Briefly Discuss on New Materials in Industry	MARKS: 5	B) Name the applications of design thinking and explain any two.	MARKS: 5	4) A) Explain the Venn diagram of design thinking	MARKS: 10	Define Ideate in design thinking and discuss any two tools of Ideate	MARKS: 10		MARKS: 5	MARKS: 5	A) What is meant by human centered design and elaborate with any two examples
n Thinking?	UNIT-I CO:1	ndustry	UNIT- I CO: 1	hinking and explain	UNIT-I CO: 1	gn thinking.	UNIT-II CO: 2	discuss any two too	UNIT-II CO: 2	(OR) e problem statemer	UNIT-II CO: 2	UNIT- II CO: 2 in design thinking? Di	ed design and elabo
	COGNITIVE LEVEL: Understand		COGNITIVE LEVEL: Understand	any two.	COGNITIVE LEVEL: Understand		COGNITIVE LEVEL: Remembering	ols of Ideate	COGNITIVE LEVEL: Remembering	(OR) Discuss the guidelines in framing the problem statement in Define phase of design thinking.	2 COGNITIVE LEVEL: Understand	MARKS: 5 UNIT- II CO: 2 COGNITIVE LEVEL: Remembering B) Define Empathy map and its use in design thinking? Discuss the process of empathy map	orate with any two examples

MARKS: 10

UNIT-

0:1

COGNITIVE LEVEL: Remembering



G.PULLAIAH COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

II B.Tech II SEM MID-II Examinations APRIL/MAY-2025 Branches: (CE,ME,EEE,ECE)

(Answer all the Original Control	Date: 03-05-2025 Max Marks: 30M
	Time: 1Hr 30Min (Answer all the Original Control of t

 $\mathfrak{J})^{\prime}$ Define creativity and innovation. How are they different? Give suitable examples. Questions

2) What makes a team effective for innovation? Mention key characteristics of an innovative team. MARKS: 10 UNIT- III CO: 3 COGNITIVE LEVEL: Remembering

3) What is meant by product planning? Describe any two key steps involved in product planning. MARKS: 10 UNIT- III CO: 3 COGNITIVE LEVEL: Understand

Explain how innovation can improve product design. Give one real-world case study as an MARKS: 10 UNIT- IV CO: 4 COGNITIVE LEVEL: Remembering

9 5) List and explain any three principles of Design Thinking that help redefine business strategies.

MARKS: 10 UNIT- V CO: 5 COGNITIVE LEVEL: Understand Explain how businesses can use prototypes to improve their products or services. Why is testing UNIT- IV CO: 4 COGNITIVE LEVEL: Understand .

MARKS: 10

MARKS: 10 UNIT- V CO: 5 COGNITIVE LEVEL: Understand

CODE: A40023

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H.T.No:

G. PULLAIAH COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

B.Tech II Year II Semester Regular Examinations May 2025 Subject Name: DESIGN THINKING AND INNOVATION

Common to CE, ME, ECE & CAI

Time: 3 Hours

SET-2

Max. Marks: 70

Instructions:

- 1. Answer all 10 questions from Part-A. Each question carries two marks
- 2. Answer one full question from each unit in Part-B. Each full question carries 10marks

		PART-A						
1	a	What are the stages of design thinking?	2M	CO1	BTL1			
	b	What is symmetry in design?	2M	COI	BTL1			
	¢	What is Product Development?	2M	CO2	BTL1			
	d	Define the term journey maps.	2M	CO2	BTL1			
	е	What are the characteristics of innovation?	2M	CO3	BTL1			
	f	What do you mean by iterative process?	2M	CO3	BTL1			
	g	Explain the meaning of sustainability.	2M	CO4	BTL1			
,	h	Define problem formation	2M	CO4	BTL1			
	i	What is brand loyalty?	2M	CO5	BTL1			
	j	What do you mean by cross functional collaboration?	2M	CO5	BTL1			
	PART-B							
-	UNIT-I							
2/		What do you mean by Design and List out the elements of Design.	10M	CO1	BTL1			
		OR	7					
3	- 1	Describe Engineering Design and the process of Engineering Design in detail.	10M	CO1	BTL2			
		UNIT-II						
4		What is Product Development, and what are its key stages in the development process?	10M	CO2	BTL1			
		OR	- (1	1.5	1			
5	I	Explain the tools of Design Thinking and how do they contribute to problem-solving.	10M	CO2	BTL2			
		UNIT-III		. 1				
6		Design a flowchart illustrating the process from idea generation to innovation?	10M	соз	BTL5			
1		OR						
	1998	Explain the transformation process of creativity to innovation	10M	СО3	BTL2			
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What are the different types of product strategies, and how do they impact business growth?	10M	CO4	BTL1				
OR		ι					
What are product specifications, and why are they essential in the product development process?	10M	CO4	BTL1				
UNIT-V							
How can startups leverage Design Thinking to drive innovation and growth?	10M	CO5	BTL2				
OR		a .					
What is the process of defining a business model or							
business case, and why is it important for business success?	10M	CO5	BTL1				
	What are product specifications, and why are they essential in the product development process? UNIT-V How can startups leverage Design Thinking to drive innovation and growth? OR What is the process of defining a business model or business case, and why is it important for business	What are the different types of product strategies, and how do they impact business growth? OR What are product specifications, and why are they essential in the product development process? UNIT-V How can startups leverage Design Thinking to drive innovation and growth? OR What is the process of defining a business model or business case, and why is it important for business 10M	What are the different types of product strategies, and how do they impact business growth? OR What are product specifications, and why are they essential in the product development process? UNIT-V How can startups leverage Design Thinking to drive innovation and growth? OR What is the process of defining a business model or business case, and why is it important for business 10M CO5				



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Subject Code	:	A40023	Subject Name	:	Design Thin	king and Inn	ov	ations
Class/Section	:	ECE	Year	:	II B.Tech	Semester	••	II-Sem

QUESTIONBANK

Name of Faculty: Mr. GUDE RAMARAO Academic Year: 2024 – 25

BLOOMS LEV	/EL				
Remember	L1	Understand	L2	Apply	L3
Analyze	L4	Evaluate	L5	Create	L6

2 Marks Questions

Unit No	Q.No	Question	CO Mapped	Bloom's Taxonomy Level	Appeared in Previous Question Papers
	1	Define design thinking.	CO1	L1	
	2	What is the primary objective of design principles in product development?	CO1	L1	
	3	List any two fundamental design principles.	CO1	L1	
Unit 1COM	4	Who coined the term "Design Thinking"?	CO1	L1	
	5	Define 'dot' as an element of design.	CO1	L1	
	6	Explain the concept of "user-centered design" in simple terms.	CO1	L2	
	7	What is the difference between aesthetics and functionality in design?	CO1	L2	
	8	What are the core stages of the design thinking process?	CO1	L2	
	9	How does the principle of contrast help in creating visual interest?	CO1	L2	
	10	How do shapes convey different emotions or ideas in design?	CO1	L4	
Unit 2	1	What are the five stages of the design thinking process?	CO2	L1	
	2	Define the term 'Persona' as used in design	CO2	L1	



		thinking	,		1
		thinking	CO2	T 1	
	3	What is the primary purpose of the 'Prototyping' stage in the design thinking process?	CO2	L1	
	4	List the key tools used in the 'Ideation' phase of design thinking.	CO2	L1	
	5	What is a 'Customer Journey Map' and why is it important in design thinking?	CO2	L1	
	6	How does the Design Thinking process contribute to the development of innovative products?	CO2	L1	
	7	What is the relationship between "Prototype" and "Innovation" in the Design Thinking process?	CO2	L2	
	8	How can Design Thinking be applied to address social challenges?	CO2	L1	
	9	What is the significance of the "Empathize" phase in solving social issues through Design Thinking?	CO2	L1	
	10	What is a "Persona" in Design Thinking, and how does it contribute to the design process?	CO2	L1	
	1	What is the difference between creativity and innovation?	CO3	L1	
	2	Define 'Innovation' in the context of organizations.	CO3	L1	
	3	What is the role of creativity in the innovation process?	CO3	L1	
	4	List two key factors that contribute to creativity within teams.	CO3	L1	
	5	What does the term 'value-based innovation' refer to?	CO3	L1	
Unit 3	6	What does the "Art of Innovation" refer to in the context of organizational success?	CO3	L2	
	7	Define the concept of "Innovation" in simple terms.	CO3	L2	
	8	How does innovation build upon creativity in the process of developing new ideas?	CO3	L1	
	9	What role does creativity play in driving innovation within organizations?	CO3	L1	
	10	How can innovation be considered a key factor for organizational growth and sustainability?	CO3	L1	
	1	What is the definition of product design?	CO4	L1	
	2	Name two key components of product specifications.	CO4	L1	
Unit 4	3	What is the difference between product strategy and product design?	CO4	L1	
	4	What does the term 'product value' refer to?	CO4	L1	
	5	What is the purpose of product planning in the	CO4	L1	



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		product development process?			
	6	What is meant by problem formation in product design?	CO4	L1	
	7	How can identifying the right problem in product design impact the final product?	CO4	L1	
	8	What is product design, and why is it crucial for a business?	CO4	L1	
	9	Explain how user feedback can influence the introduction phase of product design.	CO4	L1	
	10	Define product strategies and give one example of a successful product strategy.	CO4	L2	
	1	What are the key principles of Design Thinking applied to business innovation?	CO5	L1	
	2	What is the significance of 'predictability' as a business challenge in strategic innovation?	CO5	L1	
	3	Define the concept of 'extreme competition' in the context of business strategy.	CO5	L1	
	4	What does 'standardization' mean in a business environment, and why is it a challenge for growth?	CO5	L1	
Unit 5	5	What is the purpose of creating prototypes in the design thinking process for businesses?	CO5	L1	
UIII 3	6	What is the role of Design Thinking in business innovation?	CO5	L1	
	7	Define 'extreme competition' in the context of business strategy.	CO5	L1	
	8	What is the purpose of testing prototypes in the business model development process?	CO5	L1	
	9	What does 'maintaining relevance' mean for a company's business strategy?	CO5	L2	
	10	What is a 'business case,' and why is it important in the design thinking process?	CO5	L1	

5 Marks Questions

Unit No	Q.No	Question	COs	Bloom's Taxonom y Level	Appeared in Previous Question Papers
Unit	1	Explain the process of design thinking and its stages.	CO1	L2	
1COM	2	Describe the importance of user feedback in the iterative process of design thinking.	CO1	L2	



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	3	Discuss the role of aesthetics and functionality in design principles.	CO1	L2	
	4	How can designers balance creativity with the constraints of industry-relevant materials?	CO1	L3	
	5	Identify the key differences between traditional problem-solving and design thinking.	CO1	L3	
	6	Provide examples of how design principles can be applied in the development of a digital product.	CO1	L3	
	7	What is the significance of empathy in the design thinking process?	CO1	L2	
	8	What are some challenges in using industry-relevant materials during the prototyping phase?	CO1	L2	
	9	How can design principles be adapted for sustainable design solutions?	CO1	L3	
	10	Explain the relationship between creativity and constraints in the design process.	CO1	L2	
	1	Explain the role of empathy in the design thinking process. How does understanding the user's perspective impact the design of a product?	CO2	L2	
	2	Describe how 'Prototyping' can be used to refine ideas during the design thinking process. Why is it important to test early?	CO2	L2	
	3	How does 'Brainstorming' influence idea generation in the 'Ideation' phase? Provide an example of a technique that can be used during brainstorming.	CO2	L2	
	4	What is the purpose of creating a 'Persona' in design thinking, and how does it help the development of user-centered products?	CO2	L2	
Unit 2	5	How would you apply the 'Define' stage of the design thinking process to identify a real-world problem?	CO2	L2	
	6	Analyze how Design Thinking can be used to create social innovations aimed at improving education or healthcare. Provide an example of a social innovation that used this approach.	CO2	L4	
	7	Evaluate the impact of Design Thinking on addressing complex social problems. How does it enhance collaboration and solution generation?	CO2	L5	
	8	Discuss how Brainstorming as a tool in Design Thinking helps in generating creative solutions. Provide an example of how it is used during the Ideation phase.	CO2	L2	
	9	Explain the role of "Product Development" within	CO2	L2	



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		the Design Thinking process and its relationship with prototyping and testing.			
	10	Evaluate the usefulness of "Customer Journey Maps" in improving the user experience and how they help designers identify pain points in the process.	CO2	L3	
	1	Explain the relationship between creativity and innovation. How does one lead to the other?	CO3	L2	
	2	Why is creativity considered a crucial factor for innovation in organizations? Provide examples.	CO3	L2	
	3	Describe how teams can foster innovation through creative collaboration.	CO3	L3	
	4	Explain how innovation can be measured within an organization. What metrics are typically used to assess the value of innovation?	CO3	L3	
	5	How does 'value-based innovation' differ from traditional innovation? What impact does it have on an organization's success?	CO3	L2	
Unit 3	6	Evaluate the role of creativity and innovation in maintaining a competitive edge for organizations in today's global marketplace.	CO3	L5	
Omt 3	7	Analyze how creativity and innovation affect organizational culture and employee motivation. Provide examples from any industry.	CO3	L4	
	8	Create a strategy for integrating both creativity and innovation into an organization's daily processes and practices. How can this strategy lead to sustained growth and success?	CO3	L6	
	9	Evaluate the role of diverse teams in fostering innovation. How does the variety of perspectives and skill sets influence the creative and innovative outcomes?	CO3	L5	
	10	Apply the stages of creativity and innovation in team-based projects. What tools or frameworks can be used to guide teams through the transition from idea generation to implementation?	CO3	L6	
	1	Explain the importance of problem formation in product design. How does it influence the design process?	CO4	L2	
I Init 1	2	What are the key elements of a product strategy, and how do they impact the success of a product?	CO4	L2	
Unit 4	3	Describe the relationship between product specifical product development. How do clear specification contribute to successful design?	CO4	L2	
	4	How does innovation in product design impact the product lifecycle? Give an example.	CO4	L3	



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	5	Why is it important to consider product value when a product? How does it affect customer perceptio	CO4	L3	
	6	Analyze the importance of proper problem formation in the early stages of product design. Provide examples where improper problem formation led to product failure.	CO4	L4	
	7	Evaluate the steps involved in problem formation during product design. How does this process contribute to creating innovative solutions?	CO4	L5	
	8	Analyze the key stages involved in the product design process. How do each of these stages contribute to the overall success of the product?	CO4	L4	
	9	Design a basic framework for a new product based on the principles of product design. Highlight key considerations at each step.	CO4	L6	
	10	Imagine you are managing a company that is about to launch a new product. What product strategy would you use, and why?	CO4	L6	
	1	Explain how Design Thinking helps businesses address challenges like growth and change.	CO5	L2	
	2	How does Design Thinking redefine business strategies to maintain relevance in a competitive market?	CO5	L2	
	3	Describe how Design Thinking can be used to address business challenges related to predictability and growth.	CO5	L2	
	4	What is the role of Design Thinking in developing business models for startups?	CO5	L2	
	5	How do design thinking principles influence the way businesses approach innovation in the face of extreme competition	CO5	L2	
Unit 5	6	Explain how Design Thinking principles can help a business tackle the challenge of maintaining relevance in a highly competitive market.	CO5	L2	
	7	Describe how Design Thinking can be applied to the development of business models for startups.	CO5	L2	
	8	How does Design Thinking help in defining and testing business models? Provide an example of how this process works in a startup context.	CO5	L2	
	9	Explain the challenges businesses face in an environment with extreme competition and how Design Thinking helps to address them.	CO5	L2	
	10	Describe the role of prototypes in the product development process. How do prototypes help businesses test and validate their ideas	CO5	L3	



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10 Marks Questions

Unit No	Q. No	Question	COs	Bloom's Taxonomy Level	Appeared in Previous Question Papers
Unit 1	1	Analyze the key stages of the design thinking process and evaluate their importance in solving complex problems.	CO1	L5	
	2	Critically evaluate the role of prototype testing in design thinking. Discuss its strengths and limitations in product development.	CO1	L5	
	3	Create a design proposal for a new product, considering both the design principles and the materials required. Explain how your proposal addresses user needs and sustainability.	CO1	L6	
	4	Compare and contrast two design methodologies: Design Thinking and Systems Thinking. How would each approach be applied in the context of designing a smart home system?	CO1	L2	
	5	Evaluate how constraints such as budget, materials, and time impact the decision-making process in design thinking. Provide real-world examples.	CO1	L2	
	6	Design a solution to a common everyday problem using the principles of design thinking. Include all stages of the process and justify your choices.	CO1	L6	
	7	Analyze a product that failed in the market and evaluate how a better understanding of design thinking might have led to a more successful product.	CO1	L4	
	8	Examine the importance of collaboration between different disciplines in the design thinking process. How does this interdisciplinary approach enhance the final product?	CO1	L5	
	9	Create a prototype of an eco-friendly product, using industry-relevant materials, that addresses a social need. Explain how you would test and improve it.	CO1	L6	
	10	Assess the impact of design thinking on innovation within the tech industry. How has this methodology helped companies like Apple or Tesla create market-leading products?	CO1	L4	
Unit 2	1	Imagine you are developing a product to improve urban mobility. Use the design thinking process to outline the steps you would take, from 'Empathize' to 'Prototype.'	CO2	L3	
	2	Create a customer journey map for an e-commerce website and explain how you would use it to identify areas of improvement in user experience.	CO2	L3	
	3	You are tasked with developing a new healthcare app. How	CO2	L3	



		would you apply the 'Empathize' and 'Define' stages to understand the needs of the target users?			
	4	Imagine you are developing a product to improve urban mobility. Use the design thinking process to outline the steps you would take, from 'Empathize' to 'Prototype.'	CO2	L4	
	5	Create a customer journey map for an e-commerce website and explain how you would use it to identify areas of improvement in user experience.	CO2	L4	
	6	Evaluate the effectiveness of using the design thinking process in solving a complex, real-world problem (e.g., climate change, education, healthcare). How does it promote innovative and user-centered solutions?	CO2	L5	
	7	Critically assess the role of prototyping in the design thinking process. Can rapid prototyping always be relied upon to refine ideas? Justify your answer with examples.	CO2	L5	
	8	Evaluate the use of the 'Customer Journey Map' in improving a user experience. How well does this tool capture pain points and opportunities for innovation?	CO2	L5	
	9	Create a design thinking process to address a community issue (e.g., reducing homelessness, enhancing waste management). Justify your decisions and explain the steps taken in each phase.	CO2	L6	
	10	Develop a persona for a new app that helps people with disabilities navigate public spaces. How does this persona guide the design of your product?	CO2	L6	
Unit 3	1	Apply the concepts of creativity and innovation to a real-world example (e.g., a tech company). How did creativity drive the development of a new product?	CO3	L4	
	2	Imagine you are part of a product development team in a company. How would you integrate creativity into the innovation process to ensure the product meets market needs?	CO3	L4	
	3	How can organizations build teams that foster creativity and innovation? Provide a step-by-step strategy for implementing this in a company.	CO3	L4	
	4	Evaluate the importance of measuring the impact of creativity and innovation in organizations. How can organizations determine if their creativity initiatives are delivering value?	CO3	L5	
	5	Critically assess the effectiveness of value-based innovation in achieving both business and social goals. Are there any risks involved in adopting this approach?	CO3	L5	
	6	Evaluate the role of leadership in fostering creativity and innovation in teams. How can leaders ensure that creativity is nurtured and innovation is supported in the workplace?	CO3	L5	
	7	Assess the effectiveness of a creativity and innovation program in an organization. How would you measure its success or	CO3	L5	



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	8	Create a plan for an organization to transition from a creative idea to a fully-implemented innovative product. What steps would you include to ensure that creativity translates into successful innovation?	CO3	L6	
	9	Design an innovation program for a team that encourages creativity at every stage. What tools and strategies would you implement to foster both individual and collective innovation?	CO3	L6	
	10	Create a strategy for measuring the value of creativity and innovation in a tech startup. What specific metrics would you track to ensure growth and success?	CO3	L6	
Unit 4	1	Imagine you are designing a new smartphone. Explain how you would define the problem formation and the key challenges you would address in the design process.	CO4	L3	
	2	You have been assigned to design a new kitchen appliance. How would you create product specifications to ensure the product is functional, safe, and appealing to consumers?	CO4	L3	
	3	Choose a product in the market and analyze its product strategy. the company's product strategy align with its market goals an needs?	CO4	L3	
	4	Analyze the stages of product design and their interrelation. How does each stage contribute to the final product outcome?	CO4	L4	
	5	Examine the role of product specifications in preventing design flaws. How do clear specifications reduce the risk of product failure in the market?	CO4	L4	
	6	Analyze the impact of product strategies on market competition. How does a company's product strategy give it a competitive advantage?	CO4	L4	
	7	Evaluate how innovation in product design can disrupt existing markets. Provide an example of a product that caused a significant shift in its industry.	CO4	L4	
	8	Evaluate the role of innovation in the product design process. How do innovative designs contribute to a product's long-term success in the market?	CO4	L5	
	9	Critically assess the importance of defining clear product specifications. What consequences might arise if product specifications are not adequately defined?	CO4	L5	
	10	Evaluate a case study where a product strategy was successful. What were the key elements that led to its success?	CO4	L5	
Unit 5	1	You are working for a startup facing extreme competition. How would you apply Design Thinking to create a competitive advantage? Provide a step-by-step process.	CO5	L3	
	2	Apply Design Thinking to define and test a business model for a new product. What steps would you take to ensure the model	CO5	L3	



		is validated in the market?			
	3	Imagine you are in charge of a growing business. How would you use Design Thinking to tackle challenges related to change and unpredictability in the business environment?	CO5	L3	
	4	Analyze the role of Design Thinking in tackling business challenges like standardization and maintaining relevance. How does it provide a more adaptable approach?	CO5	L4	
	5	Examine the effectiveness of Design Thinking in meeting corporate needs. How does it enable companies to focus on customer needs while maintaining a competitive edge?	CO5	L4	
	6	Analyze how Design Thinking can be applied to the growth strategy of a company that faces unpredictable market conditions. What is the role of prototyping in this context?	CO5	L4	
	7	Evaluate the importance of Design Thinking in defining a business model that adapts to changing market conditions. How effective is it in maintaining predictability and growth?	CO5	L5	
	8	Critically assess the use of Design Thinking to address business challenges in an increasingly competitive market. Does it provide sufficient tools for companies to maintain long-term relevance?	CO5	L5	
	9	Create a Design Thinking-based strategy for a startup that aims to introduce a new product into a highly competitive market. What steps will you take to prototype and test the business model?	CO5	L3	
	10	Design a comprehensive plan for testing a new business case using Design Thinking. How would you develop prototypes to test the feasibility and market response?	CO5	L3	