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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: V - THEORY EXAMINATION (2025- 2026)

Subject: Design Thinking

Time: 2 Hours

Max. Marks: 50

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C**. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A

15

1. Attempt all parts:-

- 1-a. A city planner decides to tackle the problem of "Urban Traffic" by assuming the known problem (congestion) has a known solution (more roads). However, this fails. According to the Thinking Matrix, which approach should they have applied for this complex, unknown problem? (CO1, K3) 1
- (a) Lean Thinking
- (b) Lateral Thinking
- (c) Critical Thinking
- (d) Design Thinking
- 1-b. A team uses the 5 Whys technique to investigate why a robot stopped functioning. They discover the fuse blew because the circuit was overloaded. What step should they take next according to the technique? (CO2, K3) 1
- (a) Stop and replace the fuse.
- (b) Ask "Why was the circuit overloaded?" to find the deeper cause.
- (c) Brainstorm new robot designs.
- (d) Create a persona for the robot operator.
- 1-c. In the Six Thinking Hats method, which hat is responsible for managing the process and ensuring guidelines are observed? (CO3, K1) 1
- (a) Green Hat
- (b) Red Hat
- (c) Blue Hat
- (d) White Hat
- 1-d. What does the Double Diamond design process model represent? (CO4, K2) 1

(a)	A linear process of only divergent thinking.	
(b)	A financial model for project costs.	
(c)	A process of exploring widely (divergent) and then taking focused action (convergent).	
(d)	A method for diamond mining.	
1-e.	What is a Critical Defect? (CO5, K1)	1
(a)	A small flaw like a scratch.	
(b)	A flaw that affects appearance but not function.	
(c)	A severe flaw that poses safety hazards or makes the product unusable.	
(d)	A defect that can be fixed later.	
2.	Attempt all parts:-	
2.a.	Differentiate between "Hearing" and "Listening" in two points. (CO1, K2)	2
2.b.	List two benefits of creating Personas. (CO2, K1)	2
2.c.	Define "Metaphor" as a design tool. (CO3, K1)	2
2.d.	List the four categories in the "Four Categories Method" of idea selection. (CO4, K1)	2
2.e.	Define "Shadowing" in user research. (CO5, K1)	2
SECTION-B		15
3.	Attempt all parts:-	
3.a.	Answer any <u>one</u> of the following:-	
3.a.(i)	Analyze the concept of "Wicked Problems" by Horst Rittel. List and explain at least five characteristics that distinguish them from tame problems. (CO1, K4)	3
3.a.(ii)	Explain the "Stakeholder Mapping" process. How does the "L0 Architecture" help in identifying stakeholders in complex systems like Aadhar or IRCTC? (CO1, K3)	3
3.b.	Answer any <u>one</u> of the following:-	
3.b.(i)	Discuss the significance of "Reframing the Problem." How does shifting the perspective (e.g., using HMW questions) open up innovation? Use examples. (CO2, K4)	3
3.b.(ii)	Discuss the criteria for a successful Problem Statement. Why must it be action-oriented, human-centered, and assumption-free? (CO2, K2)	3
3.c.	Answer any <u>one</u> of the following:-	
3.c.(i)	Explain the "White Hat" thinking. How does separating "Hard Data" from "Soft Data" help in the early stages of problem-solving? (CO3, K2)	3
3.c.(ii)	Analyze the "Parking Solutions" Mind Map case. How did the visual mapping help in identifying "Long Term" vs. "Short Term" solutions? (CO3, K4)	3
3.d.	Answer any <u>one</u> of the following:-	
3.d.(i)	Discuss the concept of "Minimum Viable Product" (MVP). What are the steps to design a good MVP and what are its benefits? (CO4, K3)	3
3.d.(ii)	Comprehensive guide to "Prototyping Tools." Explain Sketches, Paper Prototypes, Role-playing, and Mock-ups with their specific use cases. (CO4, K2)	3
3.e.	Answer any <u>one</u> of the following:-	

- 3.e.(i) Critically analyze the "Successful Advertising Campaigns" (e.g., Ariel, Surf Excel, Vodafone ZooZoos). What storytelling elements made them impactful? (CO5, K4) 3
- 3.e.(ii) Explain the concept of "Satori in Software Testing." How can "aha moments" lead to improved quality and efficiency? Describe the typical steps in Satori testing. (CO5, K3) 3

SECTION-C

20

4. Answer any one of the following:-

- 4-a. Compare and contrast "Traditional Thinking" and "Design Thinking" across at least four parameters. (CO1, K4) 4
- 4-b. Describe the "Double Diamond" approach in Design Thinking focusing on Divergence and Convergence. (CO1, K2) 4

5. Answer any one of the following:-

- 5-a. Describe the "5 Whys" Root Cause Analysis method with the help of the "Robot Stopped" example. (CO2, K3) 4
- 5-b. Discuss the structure of a Persona including Goal and Scenario. Why are these elements important? (CO2, K2) 4

6. Answer any one of the following:-

- 6-a. Discuss the limitations of brainstorming (e.g., Production Blocking, Evaluation Apprehension) and how to overcome them. (CO3, K4) 4
- 6-b. Describe the process of creating a "Mind Map." How does it help in "getting unstuck"? (CO3, K2) 4

7. Answer any one of the following:-

- 7-a. Differentiate between "Internal" (Strengths, Weaknesses) and "External" (Opportunities, Threats) factors in SWOT Analysis. (CO4, K4) 4
- 7-b. Explain how "Role-playing" serves as a tool for prototyping services and human interactions. (CO4, K3) 4

8. Answer any one of the following:-

- 8-a. Analyze the "Dove: Real Beauty" campaign as a storytelling example. Why was it successful? (CO5, K4) 4
- 8-b. Explain the three types of defects: Minor, Major, and Critical with examples. (CO5, K2) 4