

Complete SEE Preparation Guide — Unit 2 (Human Computer Interaction)

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Main Takeaway

Unit 2 focuses on the *design process* in HCI, exploring human characteristics, design obstacles, principles for user-friendly systems, and effective screen/UI layout and navigation techniques. Mastering these topics, key examples, diagrams, and previous-year questions will enable full marks in SEE.

UNIT II CONTENTS

- **Design Process:** Stages, obstacles, five commandments for designing for people
- **Human Interaction with Computers:** Psychological/physical responses, human characteristics (memory, visual acuity, perception, etc.)
- **Human Consideration:** Memory, perception, visual acuity, foveal/peripheral vision, sensory storage

- **Human Interaction Speeds:** Reading rate, RSVP method, business definitions, requirements analysis
- **Screen Designing:** Goals, screen planning, organizing elements, navigation/flow, visually pleasing composition, focus/emphasis

Design Process in HCI

- **Stages:** Requirements, scenarios, task analysis, prototyping, evaluation, heuristics, deployment.
- **Interactions:** Know your users/context (not just like you!). Use interviews, ethnography.
- **Obstacles and Pitfalls:**
 1. No early analysis of user needs
 2. Focus on glitzy features, not essentials
 3. Poor prototyping, testing
 4. No unified team vision/goals
 5. Weak communication
 6. Lack of usability testing

Commandments:

1. Understand users and their tasks fully
2. Involve users early/often
3. Prototype/trial rapidly
4. Iterate — frequent improvements
5. Unify system/components

Tips to Remember:

- Always begin with analyzing user needs, then build prototypes and test iteratively.
- Draw diagrams of the design process to show each step for SEE answers.

Human Interaction with Computers

Why do users face trouble?

- Poorly designed interfaces, confusing jargon
- Too much focus on technical aspects, not behavior
- Lack of feedback, inconsistent design, dense layouts

Typical Psychological Responses:

- Confusion (info overload)
- Annoyance (inconsistencies, slow systems)

- Frustration (no undo/error explanation)

Physical Responses:

- Abandonment, misuse, compensatory activities

Exam Example: Describe a scenario where a badly designed online form forces users to redo all entries after a small error.

Tips

- Emphasize user-centric feedback, clarity, and ease-of-use in UI design.

Important Human Characteristics in Design

- **Perception:** Awareness through senses. Visual perception includes proximity, similarity, patterns, unity, closure.
- **Memory:**
 1. Short-term (working) — limited, organizes immediate data
 2. Long-term — stores learned info, accessed when needed
 3. Sensory storage — buffer for sensory input
- **Visual Acuity:** Eye's ability to resolve details (best at center of gaze)
- **Foveal/Peripheral Vision:** Center focus vs surrounding awareness (can both aid/disrupt visual search)
- **Design Tips:**
 - Minimize memory load (placing info together, controlling info pace)
 - Use icons/colors meaningfully
 - Provide familiar patterns/metaphors

SEE Question Example: Write notes on visual acuity and its role in screen layout design.

Human Interaction Speeds

- Average adult reads ~250–300 words per minute (less on screen).
- **Fast-reading tech (RSVP):** Shows single words rapidly in center (used in smartwatches/apps)

Business Definition, Requirements & Task Analysis

- Determine goals, collect requirements via interviews, scenarios
- Understand user's mental/conceptual model
- Build UI to match user's expectations — not just the designer's

Guidelines for Conceptual Models

1. Reflect user's mental model, not designer's
2. Use analogies/metaphors
3. Comply with habits/routines
4. Ensure action-response compatibility
5. Make invisible system elements visible
6. Provide feedback and documentation

SEE Question Example: Explain why conceptual models should reflect the user's expectations.

Screen Designing

- **Goals:** Clear layout, logical sequence, clean design
- **Screen Planning:** Decide purpose, what to show, clarity
- **Organizing Elements:**
 - Group logically
 - Prioritize by use/importance
 - Keep related info together
 - Use white space
- **Navigation:** Top-to-bottom, left-to-right; logical tabbing/order
- **Visually Pleasing Composition:**
 - Symmetry, balance, unity
 - Avoid clutter/dense blocks
 - Sequential visual flow
 - Economical use of colors/fonts

Example Diagram:

Space to separate, structure, highlight:

Tips & Tricks for Scoring Full Marks

- Use real examples (ATM, mobile app), draw diagrams for design process, screen layout, or typical UI.
- Highlight important terms.
- Discuss limitations, solutions, and ways to improve user experience.
- Relate theory to practical systems (mobile, hospital dashboards, banking apps).
- Mark **important topics:** Design process stages, user analysis, screen layout principles, memory/perception in UI.

- Practice previous year questions!

Memory Tip: Create acronyms for design commandments (like U-P-P-I-U: Users, Prototyping, Participation, Iteration, Unification)

SEE Pattern & Previous Year Questions — Unit 2

Typical Pattern: 2-marks (definitions, differences), 5-marks (scenarios, short notes), 8/10-marks (detailed explanations/examples)

Sample Questions (with Answers)

Q1. Define ergonomics in context of HCI.

- Ergonomics: Study of designing systems/products to fit users' physical, cognitive, and emotional capabilities. In HCI, it ensures interfaces reduce strain and enhance comfort.

Q2. List any two ergonomic input devices and specify their functions.

- Ergonomic keyboard (reduces wrist strain), Vertical mouse (less forearm twisting).

Q3. Elaborate on obstacles in design process.

- Lack of user analysis, poor prototyping, miscommunication, missing usability tests — lead to ineffective products.

Q4. List psychological responses to poor design.

- Confusion, annoyance, frustration, panic, boredom (SEE: give real-world examples, e.g. exam portals, banking apps).

Q5. Explain design process with diagram.

- Stages from requirements to deployment: draw a flow diagram, e.g. Need → Scenarios → Task Analysis → Prototyping → Testing → Deployment.

Q6. Compare behavioral and performance design goals with examples.

- *Behavioral Goal:* Motivate healthier lifestyle (step count reward)
- *Performance Goal:* Accurately record steps, heart rate.

Assignment/Previous Year SEE QPs (Unit 2)

- Name two ergonomic input devices and specify function.
- Evaluate cognitive challenges users face in an online exam interface and suggest design solutions.
- List typical psychological responses to poor design.
- Elaborate on obstacles in development path of design process.

Sample Short Answers for QP:

- Ergonomic devices: See answer above
- Cognitive challenges: Interface complexity, unclear instructions, info overload; solutions: clean design, feedback, error handling

- Psychological responses: List and explain briefly
- Obstacles: User needs missing, feature focus wrong, team issues

Most Important Topics to Mark

- Design Process and Stages
- Human Characteristics in Design (Memory, Perception, Visuals)
- Obstacles and Pitfalls
- Screen Design Principles (Layout, Organization, Navigation)
- Psychological/physical responses to poor design
- Previous-year questions/issues and solutions

Diagrams & Examples

- Always include flowchart/diagrams for design process, UI layout, and conceptual models.
- Use examples: ATM error, online exam, mobile dashboard

References & Further Reading

- *Unit2.pdf, QnBank_HCI.pdf, QP2_IA1.pdf*
- SEE pattern from previous IA and QnBank papers

Final Tips

- Practice answering all types of questions (short notes, essays, scenarios).
- Use diagrams, mark keywords.
- Focus answers around user analysis, iterative design, clean UI principles.
- Apply memory/perception theory to practical examples.

Good luck! Review diagrams/examples, mark these topics, and you'll score full marks in SEE Unit 2!