K. K. Wagh Institute of Engineering Education and Research, Nashik
(An Autonomous Institute from A. Y. 2022-23)

Exam Seat No.:
End-Sem Examination-I — Winter 2025
Academic Year: 2025-26 — Sem: I
Class: F.Y — Program: MCA
Branch Code:09 — Pattern: 2024
Name of Course:UI/UX Design — Course Code: 2409505B
Max. Marks: 60 — Duration: 2:30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.
(*keep space*)
1. This question paper contains 2page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicate the Course Outcome.

Q. No.	Details	Max. Marks	CO No.	BT Level
Q.1	Identify the six stages of UX design. Ans: Step 1: Understand your customers and their values Step 2: Research the competition Step 3: Sketch out your product Step 4: Design your product Step 5: Implement the solution onto a webpage Step 6: Evaluate the work and improve it	[6]	CO1	L1
Q.2	Describe common legal issues in Interface Design. Ans: • Potential Controversies • What material is eligible for copyright? • Are copyrights or patents more appropriate for user interfaces? • What constitutes copyright infringement? • Should user interfaces be copyrighted? • Evolving public policies related to: • Privacy • Liability related to system safety/reliability • Freedom of speech	[6]	CO2	L2
Q.3	a) Explain the concept of Direct Manipulation and why it improves user experience. (8 Marks) Ans: Introduction Direct manipulation is an interaction technique in graphical user interfaces where users move depictions of objects around and get immediate feedback about their actions and the outcome of these actions. Direct Manipulation refers to interacting with digital objects as if they were real physical objects. Examples include dragging	[16]	CO3	L2

	files to folders, resizing windows by pulling edges, or rotating 3D models with touch gestures. **It improves user experience because:** 1. **Immediate Feedback:** Users see instant results of their actions, which builds confidence and reduces confusion. 2. **Reduced Cognitive Load:** The interface is more intuitive; users don't need to memorize commands or menus. Actions feel natural. 3. **Increased Sense of Control:** Users feel in charge of the interface instead of feeling controlled by it. 4. **Better Engagement:** The interactive, visual nature makes experiences more enjoyable and immersive. 5. **Error Reduction:** Because users directly manipulate objects, mistakes occur less often and are easier to correct. **OR** b)Distinguish between Virtual Reality (VR) and Augmented Reality (AR) using examples. (8 Marks) Ans: **Virtual Reality (VR):** • Creates a **completely artificial 3D environment** that replaces the real world. • Requires VR headsets like Oculus Rift. • Used for gaming, training simulations, virtual tours. • Example: A pilot training in a VR flight simulator. **Augmented Reality (AR):** • Adds **virtual objects to the real world** using a screen or glasses. • Users see both real surroundings and digital overlays. • Used in education, navigation, retail. • Example: Pokémon Go placing virtual characters in real locations. **Main Difference:** VR replaces reality, AR enhances reality.			
	c)Describe four menu structures and explain how they support user navigation.(8 Marks) Ans: 1. Single Menus		CO3	L2

	Single menus display all available options on one screen or panel, allowing the user to make a direct selection without navigating through multiple layers. This structure is simple, easy to understand, and ideal when the number of functions is limited. Because everything is visible at once, users experience low cognitive load and quick decision-making. For beginners, single menus reduce confusion and provide immediate access to key features. They are commonly used in mobile apps, home screens, and kiosks where clarity and speed are important. 2. Sequential Linear Menus Sequential linear menus guide users through a step-by-step sequence, where each menu leads to the next one in a fixed order. Users must complete each step before moving forward, similar to a wizard interface or a form-filling workflow. This structure is helpful when tasks must be performed in a specific order, such as installation processes, booking systems, or registration forms. The navigation is predictable and reduces errors because users cannot skip necessary steps. 3. Simultaneous Menus Simultaneous menus provide multiple menus on a single screen at the same time, often arranged side-by-side or in panels. They allow users to compare options, choose from different categories, and perform multi-step operations without moving to new pages. This structure improves efficiency by presenting parallel choices and supporting complex tasks. A common example is dashboard interfaces or settings pages where users can customize various options simultaneously. It enhances productivity for experienced users who prefer direct access to multiple controls. 4. Hierarchical Menus Hierarchical menus are organized in levels and sublevels, forming a structure similar to a tree. Each main menu contains submenus, which may contain further options. This approach is useful when dealing with large amounts of information, as it groups related items together and prevents interface clutter. Users can navigate deeper into categories as needed, improving organization and discoverability. Examples include website navigation bars, file explorer systems, and complex application menus. Hierarchical menus support both beginners and advanced users by offering a clear structure. 5. Event-Trapping Menus Event-trapping menus appear automatically in response to user			

	actions, such as right-clicking, hovering, or selecting an object. These menus enhance usability by offering context-specific options, reducing unnecessary steps and making interactions more efficient. They help users perform tasks that are relevant to their current focus without navigating away. Common examples are context menus in operating systems, hover menus, and shortcut menus in design tools. Event-trapping menus support fast workflows and improve user satisfaction by being flexible and responsive. **OR** d)Explain the four main functions of menus in UI/UX design.(8 Marks) Ans: **Navigation to a New Menu** The menu helps the user move from one section or screen to another — it's primarily for navigation within the interface. Website navigation bar: "Home | Products | About | Contact" — each link opens a new page. Mobile app tab bar: Icons like "Home," "Search," "Messages," "Profile" (e.g., Instagram bottom nav). Side/hamburger menu: Expands to show navigation links to different app sections (e.g., YouTube app). **Execute an Action or Procedure** The menu's role is to trigger a specific function or command immediately when the user selects an option. File menu in desktop apps: "Save," "Print," "Exit," "Undo" — each performs an immediate action. Context menu (right-click): "Copy," "Paste," "Delete." Music app options: Three-dot (⋮) menu → "Add to Playlist," "Share," "Download." **Displaying Information** Menus can also be used to display system status or user-specific information, not just for actions or navigation User profile dropdown: Shows username, email, and account type (e.g., Google Account menu). System status menu on macOS or Windows: Battery level, Wi-Fi status, date/time — all displayed via menus. Notification dropdown: Expands to show unread messages or alerts. **Data or Parameter Input** Some menus allow users to enter data or choose parameters that influence system behavior or outcomes.			

	Settings menus: Select theme (Light/Dark Mode) Adjust volume slider Change language dropdown Filter menus: "Price range," "Category," "Sort by" on shopping sites. Date picker menu: Select check-in/check-out dates in booking apps.			
Q.4	a)Apply windowing system ideas to design a basic screen layout.(8 marks) Ans: A standard window-based layout includes: • **Title Bar:** Displays screen name and window controls (close/minimise). • **Menu Bar:** Provides main commands like File, Edit, View. • **Tool Bar:** Contains frequently used shortcuts. • **Main Content Area:** Displays documents, forms, or workspace. • **Side Panel:** Offers navigation links or tools. • **Status Bar:** Shows messages like "Saving..." or "Loading". • **Resizable Borders:** Help users adjust window size for multitasking. This structure improves organisation, boosts usability, and supports efficient workflow. **OR** b)Use selection controls (radio, check box, list box) to build a small input screen. (8 marks) Ans: A small data input screen can be designed using: • **Radio Buttons:** Used when only one option must be selected. Example: Gender: Male/Female/Other. • **Check Boxes:** Allow multiple selections. Example: Hobbies: Reading, Sports, Painting. • **List Box:** Presents a long list of items in scrollable form. Example: Select Country from list. These controls help users provide accurate and structured input, reducing errors and improving clarity.	[16]	CO4	L3

c)Use operable controls (buttons, sliders, tabs) to make a screen interactive with example. (8marks)
Ans:

- **Buttons:**
  Perform actions like Submit, Cancel, and Save.
  They provide immediate feedback through click responses.
- **Sliders:**
  Allow users to adjust values visually (e.g., volume, brightness).
  They provide precise control with instant updates.
- **Tabs:**
  Divide content into separate sections within the same screen.
  Improve navigation without switching pages.

Together, these controls make the interface dynamic, responsive, and easy to use.

Login Tab:

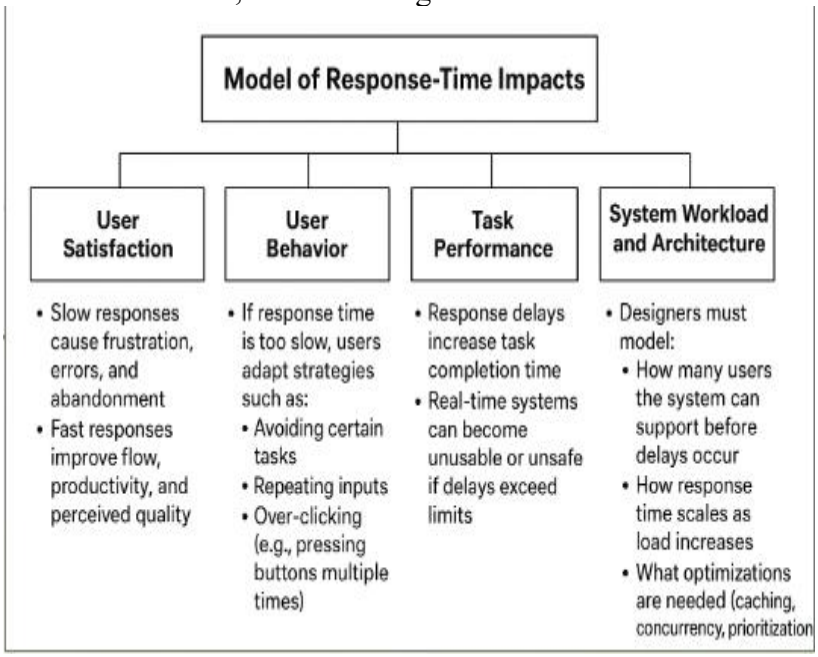
- Label: *"Username"*
- Input Box (editable)
- Label: *"Password"*
- Input Box (editable)
- **Login Button**

CO4 | L3

OR

d)Apply read-only controls like text boxes to show information clearly with Example. (8marks)
Ans:

1. **Read-Only Text Box:**
   - When a new user opens the registration page, a field shows:
     User ID: 125874 (Auto-Generated) — this cannot be edited.
2. **Label:**
   - Labels such as **"Enter Email"**, **"Password"**, **"Confirm Password"**, help users understand what to type.
3. **Display Field / Output Box:**
   - After clicking *Register*, a read-only box displays:
     Status: Registration Successful
     The user cannot edit this message.

	Register Tab: • Read-Only Text Box: *"User ID: 10293"* • Label + Input: *"Full Name"* • Label + Input: *"Email Address"* • Slider: *"Set Privacy Level"* • **Register Button** • Display Field (read-only): *"Status: Waiting for submission…"*			
Q.5	a)Examine the impact of response time variability on user performance.(8 marks) Ans: Response Time = Number of seconds it takes from the moment a user initiates an action (e.g., by pressing a button or ENTER) until the computer begins to present results on the display, printer, etc. The response commonly leads to the user formulating a new goal Computer response times can be measured and/or predicted <u>User Think Time</u> = Time that users think before initiating the next action User think times are very difficult to measure or predict <u>Simple model of response time</u> Users (1) initiate, (2) wait for response, (3) watch results, (4) think for a while, and initiate again  **OR**	[16]	CO5	L4

b)Compare good and bad error messages to find what makes them effective. (8 marks)

Ans:

Error Messages

User experience with computer-system prompts, explanations, error diagnostics, and warnings is crucial in influencing acceptance of SW systems

Make error messages as user-friendly as possible; this is especially important for novice users as they commonly have a lack of knowledge, confidence, and are sometimes easily frustrated or discouraged

Rules to follow

1.Specificity: Avoid being too general (e.g., "Syntax Error") This makes it difficult to understand what went wrong and how it can be fixed.\

Poor	Better
SYNTAX ERROR	Unmatched left parenthesis
ILLEGAL ENTRY	Type first letter: Send, Read, or Drop
INVALID DATA	Days range from 1 to 31
BAD FILE NAME	File names must begin with a letter

2. Constructive Guidance and Tone

Poor	Better
Run-Time error '-2147469 (800405): Method 'Private Profile String' of object 'System' failed.	Virtual memory space consumed. Close some programs and retry.
Resource Conflict Bus: 00 Device: 03 Function: 01	Remove your compact flash card and restart
Network connection refused.	Your password was not recognized. Please retype.
Bad date.	Drop-off date must come after pickup date.

8

3. User Centered Phrasing: User initiates more than responds

- Good example
- We're sorry, but we are unable to complete your call as dialed
- Please hang up, check your number, or consult the operator for assistance
- Bad example
- Illegal telephone number
- Call aborted
- Error number 583-2R6.9

Consult your user manual for further information

c)Examine a web Page design and point out strengths and | | CO5 | L4

weaknesses.(8marks)
Ans:

Strengths:

- Clean layout and readable fonts for easy scanning.
- Well-organized navigation bar helps users find content quickly.
- Proper spacing and visuals improve appearance.
- Responsive design adapts to mobile and desktop.
- Optimized images allow fast loading.

Weaknesses:

- Excessive ads/pop-ups distract users.
- Crowded content reduces readability.
- Low contrast affects text visibility.
- Poor alignment makes the page look unprofessional.
- Slow media loads reduce user satisfaction.

OR

d)Examine how user interfaces can impact both society and individuals. (8marks)
Ans:
User Interfaces (UIs) play a central role in how people interact with technology, shaping experiences, behaviour, efficiency, and even social relationships. As digital devices become deeply integrated into daily life—smartphones, computers, kiosks, wearables, and smart appliances—the design and quality of their interfaces strongly influence both individual users and society as a whole. The impact can be observed through accessibility, productivity, social interaction, safety, and even cultural changes.

1. Improved Accessibility and Inclusion

Modern UIs enable people of all abilities to use digital systems effectively. Features such as screen readers, voice-based interfaces, gesture controls, large icons, and customizable layouts increase accessibility for elderly users and people with disabilities. Inclusive design ensures that technology becomes a tool for empowerment rather than exclusion. For example, visually impaired users can navigate smartphones through voice commands, making information and communication more equitable.

2. Enhanced User Productivity and Efficiency

Well-designed UIs help individuals complete tasks faster and with fewer errors. Intuitive navigation, consistent layouts, and

	clear feedback reduce cognitive load and increase confidence among users. In workplaces, efficient UIs improve employee performance, reduce training time, and minimize operational mistakes. Society benefits through higher productivity, faster services, and smoother digital operations across industries such as banking, healthcare, and transportation. 3. Influence on Human Behaviour and Lifestyle Interfaces directly shape how individuals think, interact, and behave. Social media UIs, designed with notifications, infinite scrolling, and personalized feeds, influence attention spans, social habits, and even emotional well-being. Similarly, fitness apps use UI elements like progress bars, badges, and reminders to motivate healthier lifestyle choices. Thus, UI design becomes a psychological tool that can guide or modify user behaviour. 4. Social Connectivity and Communication User interfaces bridge geographical distances by enabling seamless communication through messaging apps, video conferencing, and collaborative platforms. People can maintain relationships, participate in global discussions, and work remotely due to simple and user-friendly interfaces. Society becomes more connected, but this also introduces challenges, such as reduced face-to-face interactions and an increased dependence on digital communication. 5. Cultural Influence and Globalization UI design often reflects cultural norms—language, symbols, colours, and layouts differ across regions. As global apps standardize their interfaces, they influence cultural habits and introduce shared digital behaviours worldwide. This contributes to digital globalization, where people from different cultures adopt similar digital lifestyles and communication patterns, fostering global familiarity but sometimes weakening local traditions. 6. Increased Safety and Decision-Making Support Clear and informative interfaces in fields like aviation, healthcare, and driving systems directly impact human safety. For example, hospital monitoring interfaces present critical patient information in an organized manner, helping doctors make fast decisions. Similarly, UI in vehicles supports drivers through navigation and sensor warnings. Poor interfaces, on the other hand, may lead to misunderstandings, accidents, or incorrect decisions.			

	7. Economic Growth and Opportunities UI design has led to the rise of new careers such as UI/UX designers, interaction designers, and usability testers. Companies with better interfaces attract more customers, promote e-commerce, and drive digital innovation. On a societal level, improved UIs support digital economies, entrepreneurship, and technological development, contributing to overall economic advancement. 8. Dependence on Technology and Privacy Concerns Although UIs make life easier, they also increase reliance on digital systems. Easy-to-use interfaces may unintentionally encourage over-usage of apps, digital addiction, or distraction. Additionally, users share personal data through interfaces without fully understanding privacy implications. Society faces challenges related to data misuse, surveillance, and reduced personal boundaries.			