



VIT®

Vellore Institute of Technology

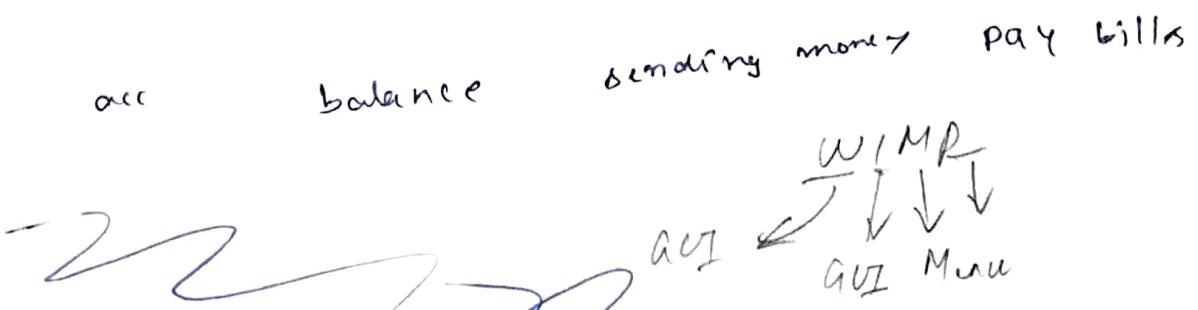
(Deemed to be University under section 3 of UGC Act, 1956)

Continuous Assessment Test- I October 2023

Programme	: B.Tech (CSE)	Semester	: Fall Semester 2023-2024
Course	: Human Computer Interaction	Code	: CSE4015
		Class Nbr	: CH2023240100261, CH2023240100263
Faculty	: Dr. Lakshmi Harika Palivelal, Dr.V.Premanand	Slot(s)	: D1+TD1
Time	: 90 minutes	Max. Marks	: 50

Answer ALL the Questions

1. Imagine a student studying in VIT, Deepika, is preparing for her end semester exams. She needs [10] to remember various pieces of information, from historical dates to complex mathematical formulas.
Discuss how the different types of human memory play a role in Deepika's exam preparation, and how she might use each type to her advantage. (Module 01)
2. Consider the role of a usability analyst who is responsible for enhancing the user interface of a [10] banking application. Customers' ability to do routine banking operations including checking account balances, moving money, and paying bills will be made more user-friendly and effective. In this context employ Hierarchical Task Analysis (HTA) to analyse the current user tasks and create a more user-friendly interface. (Module 02)
3. In the development of our new productivity software, we are exploring the use of a WIMP [6+4] interaction style, which includes windows, icons, menus, and pointing devices. Can you share your thoughts on this interaction style? How comfortable are you with using windows for multitasking, icons for quick recognition, menus for navigation, and pointing devices (like a mouse or touchpad) for precise interaction? (Module 03)
Also specify the drawbacks of other types of interaction styles?
4. Imagine you are tasked with conducting a GOMS analysis for a popular email client application. [10]
The goal is to calculate the time it takes for a user to compose and send a new email message to a



contact in their address book. Describe the high-level goals in email composition and how you would apply selection rules to determine which method the user is likely to follow in a given situation (e.g., when the user has a specific email address in mind or is attaching a file to the email).

(Module 02)

5. How do you think presenting words or phrases with mismatched colors, such as 'GREEN' written [10] in red ink, during classroom activities might impact students' attention and concentration? Do you believe this type of activity could serve as a useful tool to help students enhance their focus and minimize distractions during lectures or exams. Explain about the types of stimuli that can impact the Stroop effect in education.

k h p b m



VIT[®]

Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)
CHENNAI

Reg. Number:

Continuous Assessment Test(CAT) – I - FEB 2024

Programme	:	B.Tech Computer Science and Engineering	Semester	:	Winter 23-2024
Course Code & Course Title	:	BCSE415L / CSE4015 & Human Computer Interaction	Class Numbers	:	CH2023240501756 CH2023240501741 CH2023240501744 CH2023240501761 CH2023240503371 CH2023240501748
Faculty(s)	:	Dr. Sathiskumar B Dr. Prassanna J Dr. Deepika Roselind J Dr. Christopher Columbus C Dr. Santhi V	Slot	:	D1+TD1
Duration	:	1 hour 30 Minutes	Max. Mark		50

General Instructions:

- Write only your registration number on the question paper in the box provided and do not write other information.

Answer all questions

Q. No	Sub Sec.	Description	Marks
1		Goa is an international tourist destination with many foreign visitors visiting the coastal state every year. To cater to the demands of the increasing customer flow, leading sandwich company plans to design a user-friendly digital self-order kiosk for ordering, customization and follow-up delivery of sandwiches to cater to the diverse tastes and expectations of travellers from around the world. As an HCI designer, identify and design an appropriate input and output interface for the self-ordering kiosk designed to cater to the needs of diversified visitors in the international city of Goa and justify your selection. (mod3)	10
2		Imagine you are tasked with setting up a smart home automation system (AutoHome) for controlling electronic appliances such as TV, AC, fan, light etc. It also features in-house garbage management system for indicating the capacity of the smart dustbins and schedule the discharge of waste. Additionally, the app can visualize the electricity consumption history. Design the UI for "AutoHome" and illustrate the incorporation of HCI guidelines in the design with justifications. (mod3)	10

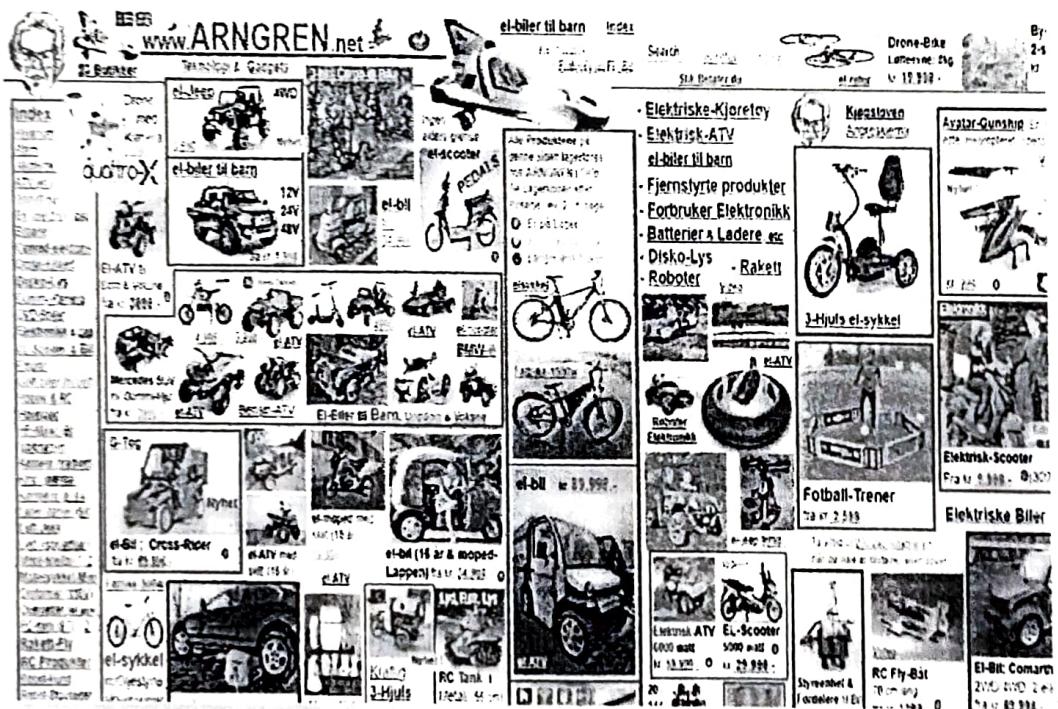
The Indian Railways has been planning to develop "Rail Yatri Guide" a touch screen kiosk, as a single-point enquiry station for answering all the queries of passengers, including guidance and navigation for accessing various facilities available at the railway station. Assume that you are the UI designer for the on-screen application of the "Rail Yatri Guide" kiosk. Develop a hierarchical task analysis (HTA) diagram for "Rail Yatri Guide". Also, design two interfaces and critically analyse the implications of Fitts' law on the design. (mod2)

10

The Department of Training and Workforce Development of the state government is planning to develop an interactive digital e-learning solution named “digiLearn”. The plan is to develop an online virtual student response system that enables registered students to contribute to classroom discussions with peers and instructors via live chats, submit responses via prompts, tracks course progress and provide feedback. Discuss how different interaction styles can be used for modelling the interaction type between the users of the application. (modD)

10

Examine the following interface:



Specify the UI Golden Rules that have been violated by this interface. Examine the impact of the Golden Rules on increasing the user productivity.

$(m \bmod 3)$

***** All the best *****

**Continuous Assessment Test (CAT) – II - APRIL 2024**

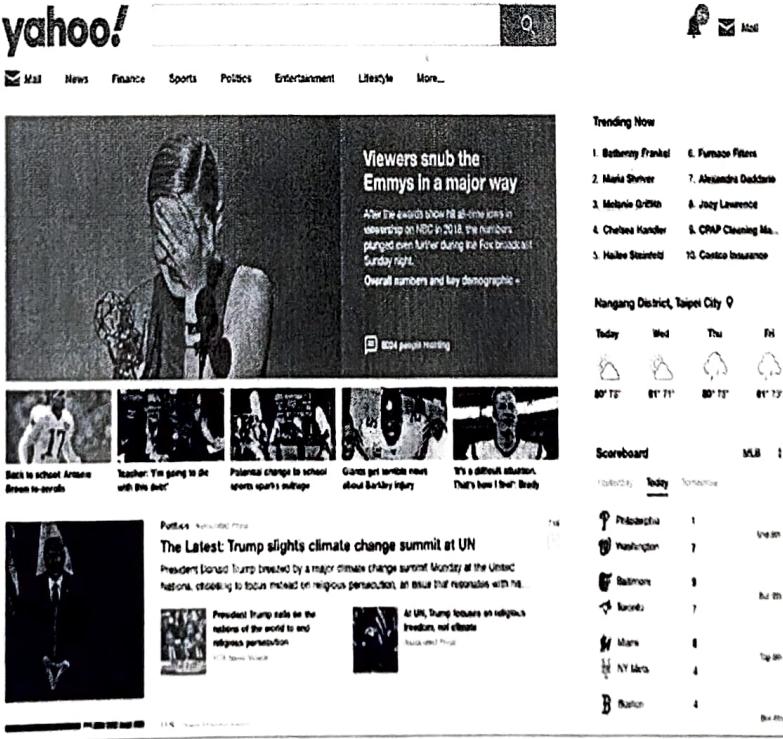
Programme	:	B.Tech Computer Science and Engineering	Semester	:	Winter 23-2024
Course Code & Course Title	:	BCSE415L / CSE4015 & Human Computer Interaction	Class Numbers	:	CH2023240501756 CH2023240501741 CH2023240501744 CH2023240501761 CH2023240503371 CH2023240501748
Faculty(s)	:	Dr. Sathiskumar B Dr. Prassanna J Dr. Deepika Roselind J Dr. Christopher Columbus C Dr. Santhi V	Slot	:	D1+TD1
Duration	:	1 hour 30 Minutes	Max. Mark	:	50

General Instructions:

- Write only your registration number on the question paper in the box provided and do not write other information.

Answer all questions

Q. No	Sub Sec.	Description	Marks
1		Assume that you are the UI/UX designer for a fitness tracking web application. The application allows users to set fitness goals, track their workouts, monitor their progress, and connect with friends for motivation. It includes features such as workout logging, calorie tracking, goal reminders, and social sharing capabilities. Design mock UI designs to illustrate the mapping of various states and transitions triggered by user actions and system responses for any two features of the fitness tracking web application.	10
2		Imagine that you are a HCI designer responsible for designing a user interface for a currency converter application enabling users to convert USD to other currencies. Consider the following scenario, where users interact with the application by selecting the target currency from a dropdown menu. They then input the amount in USD using the keyboard and press 'Enter' to initiate the conversion process. Finally, the system then displays the converted amount in the designated output area. Analyze this scenario using the Keystroke-Level Model by identifying the user actions involved and estimate the time required for a minimum of two tasks. Based on the analysis,	10

		provide appropriate mockup designs for the currency converter.	
3		<p>Mr. Deepak, aged 70 years, is a retired government school teacher whose main source of income is his pension cheque. He and his wife recently sold their house and moved to a new house. In order to receive the pension cheque, Mr. Deepak has to notify the pension office regarding his address change, and the office is located very far from their new house. Instead of physically going to the pension office due to his old age, he would like to use the computer to notify the pension office regarding their new address using its official website. However, he is nervous about doing a task like this using the computer since he has never used it. Recently, for his birthday, his son Kunal gifted him a computer and set it up. His son shows him how to use email and browse essential websites. Mr. Deepak has never visited the pension website, so he does not know how it is organized and is also reluctant to provide his personal information online due to recent news of identity fraud.</p> <p>Create storyboarding for the above scenario to understand the design needs for developing the socio-technical application and to understand the user persona. Also, list the design needs and user persona derived from storyboarding.</p>	10 ✓
4		<p>Consider the following website design provided below. Evaluate the UI of the website using Jakob Nielsen's usability heuristics principles and provide design suggestions to overcome the drawbacks identified.</p>  <p>The screenshot shows the Yahoo homepage with the following visible elements:</p> <ul style="list-style-type: none"> Top Navigation: Mail, News, Finance, Sports, Politics, Entertainment, Lifestyle, More... Search Bar: A large search input field with a magnifying glass icon. Profile and Mail Icons: Icons for profile and mail. Trending Now: <ul style="list-style-type: none"> 1. Batteries扁了 2. Maria Shriver 3. Melvin O'Bryan 4. Chelsea Handler 5. Hailee Steinfeld 6. Furnace Filters 7. Alexandre DaSilva 8. Joey Lawrence 9. CRAP Cleaning Ma.. 10. Conica Insurance Weather Section: Hengang District, Taipei City 9. Shows a 5-day forecast for Today, Wed, Thu, Fri with icons and temperatures (e.g., 80° 75°). Scoreboard: Shows a table with columns for Category, Today, Tomorrow, and Team. Includes entries for Philadelphia, Washington, Baltimore, Kansas, Miami, NY Mets, and Boston. News Sections: <ul style="list-style-type: none"> Viewers snub the Emmys in a major way: An image of a person in a red dress, text about low viewership, and a note about 82nd people hosting. Back to school Arizona Green to Davis: An image of a person in a green shirt. Teacher: I'm going to die with this book! Potential change to school sports' makeup: Gangs get serious now about Barstool injury: It's a difficult situation. That's how I feel: Brady: The Latest: Trump slights climate change summit at UN: An image of Donald Trump, text about the UN climate summit, and a note about Trump's stance on religious freedom. President Trump raps on the nature of the world to end religious persecution: An image of Donald Trump rapping. All UN, Trump focus on religious freedom, not climate: 	10 ✓

5

Consider the following web design provided below and answer the following.

Identify and describe five web design mistakes and distractions from the web design with neat snapshots. Provide suggestions to improve the web design with relevant justification.

The screenshot displays the HavenWorks.com homepage with several key features:

- Top Navigation:** Includes links for "AZ", "Search", "News by Date", "NewStand", "Global", and "US". Below these are links for the "2008 Election", "A-B-C-D-E-F-G-H-I-J-K-L-M-N-O-P-Q-R-S-T-U-V-W-X-Y-Z", and "Bill Moyers Journal".
- Main Content Area:**
 - A large banner for "HavenWorks.com" featuring a search bar and links for "GO", "E-mail", "Web", and "RSS Feed".
 - Two main news sections: "Democratic News" and "Republican News".
 - A third section titled "Atwater Politics".
 - A prominent headline: "Two Senate Clauses or How The Republican Party Has Corroded America for Thirty Years".
 - Links to "DEM 2010 TV", "OBAMA TV", "WHITE HOUSE TV", and "GOP (Republicans) Fighting For Money From Stimulus".
 - Opinion pieces by Jay Rosen and Glenn Greenwald.
 - Links to "Hartmann MP3-TV", "Greenwald - Bush MP3s", and "Blog* TV Blog".
 - A "Weblog" section.
 - A sidebar for "INTELLIGENCE" and "IRAQ NEWS", mentioning "War Crimes".
- Bottom Navigation:** Includes a "CALENDAR" and a "FRONTLINE NewsWar" link.
- Footer:** A "Fair Balance" link and the "USA News United" logo.

10

***** All the best *****

**VIT**

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act 1956)

Continuous Assessment Test- II October 2023

Programme	: B.Tech (CSE)	Semester	: Fall Semester 2023-2024
Course	: Human Computer Interaction	Code	: CSE4015
		Class Nbr	: CH2023240100261, CH2023240100263
Faculty	: Dr. Lakshmi Harika Palivela, Dr. V. Premanand	Slot(s)	: D1+TD1
Time	: 90 minutes	Max. Marks	: 50

Answer ALL the Questions

1. i) How has Apple Inc. effectively applied Shneiderman's eight golden rules in their product designs, particularly in their Macintosh and mobile devices, contributing to their consistent success and reputation for intuitive and beautiful designs? [5+5]
- ii) How does Apple handle error messages and notifications to ensure users receive clear feedback when something goes wrong?
2. A new e-commerce website for a retail company is planning for designing a user-friendly and visually appealing platform for their customers. [5+5]
- i) How would you apply Donald Norman's seven principles in the design of the website to enhance visibility to help users easily find and navigate through product categories?
- ii) In what ways can you implement constraints in the website design to guide users effectively through product categories and the shopping cart while preventing confusion?
3. A project manager in a large software development company is having team spread across different geographical locations, and he is tasked with ensuring effective collaboration among team members. [5+5]
- i) Discuss the key challenges faced in achieving seamless cooperation in this distributed work environment.
- ii) Can you explain a comprehensive strategy for managing a geographically dispersed software development team that effectively leverages the principles and values of Computer-Supported Cooperative Work (CSCW) theory to mitigate the multifaceted challenges associated with geographic dispersion, foster seamless collaboration, and ultimately optimise productivity?

4. You've been hired as a User Interface designer for railway department, and your task is to [5+5] improve the existing online railway reservation system. The current system is outdated, and users frequently encounter issues while trying to book tickets, resulting in frustration and a decline in online ticket sales. (Mod-6)
- i) How would you apply the principles of Jackson System Development (JSD) to redesign the railway reservation system, considering the specific needs and challenges of the railway industry and the users with the aim of addressing the frustrations users face and enhancing online ticket sales?
 - ii) Could you outline the key steps you would take, and explain how JSD can assist in this context, providing a well-organized system architecture that takes into account the railway industry's unique requirements and user needs while ensuring a more efficient and user-friendly online ticket booking experience?
5. You work for an automotive manufacturer, and you want to implement Augmented Reality in the [5+5] design and maintenance of vehicles.
- i) Describe a scenario where AR can be used to assist mechanics in diagnosing and repairing complex car engine issues.
 - ii) How does the automotive manufacturer utilize the success of email systems in its operations and communication with stakeholders, and in what specific ways does this leverage enhance their efficiency and collaboration across different aspects of their business?



VIT[®]

Vellore Institute of Technology
(Deemed to be University under section 3 of the UGC Act, 1956)

Reg. No. :

21BCF1208

Final Assessment Test (FAT) - May 2024

Programme	B.Tech.	Semester	WINTER SEMESTER 2023 - 24
Course Title	HUMAN COMPUTER INTERACTION	Course Code	BCSE415L
Faculty Name	Prof. DEEPIKA ROSELIND J	Slot	D1+TD1
Time	3 Hours	Max. Marks	100

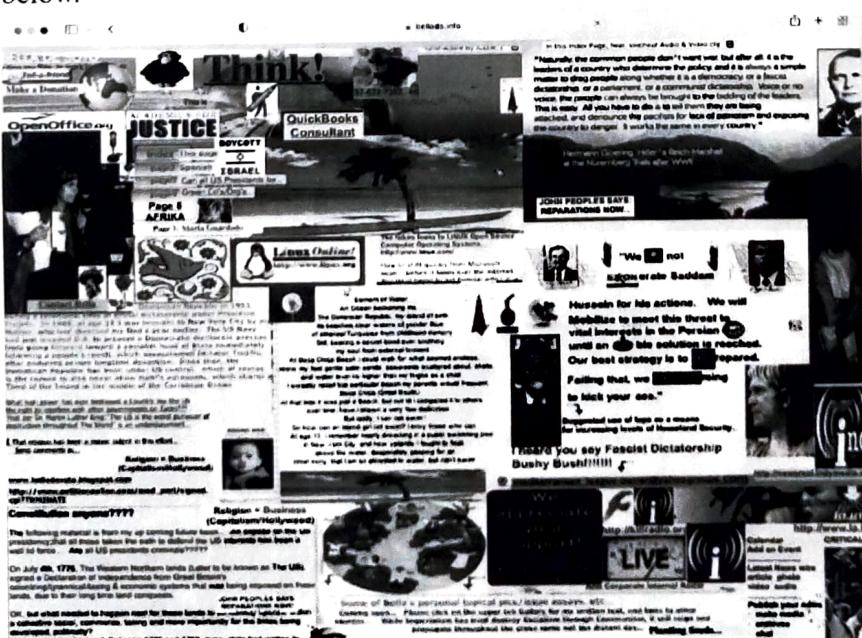
General Instructions:

- Write only Register Number in the Question Paper where space is provided (right-side at the top) & do not write any other details.

Section - I

Answer all questions (6 X 10 Marks = 60 Marks)

- 01: You are part of a team of HCI designers tasked with creating an online learning platform tailored for students preparing for competitive exams. To accomplish this, the platform will incorporate various interactive features such as practice tests, flashcards, video lectures, real-time progress tracking, schedule the timetable, personalized recommendations and discussion forums.
- Design the interface with appropriate interaction style based on human-problem solving approach for any two features of the application. [5 Marks]
 - Elaborate on any sequence of task interaction in your interface design that justifies your choice of elements that optimize the interface using the human-problem solving approach. [5 Marks]
- 02: Consider the screenshot of the website design provided and answer the questions provided below. [10]



- i. Specify the Norman's principles of interaction design that have been violated in this website design. [5 Marks]
- ii. Examine the impact of Norman's principles on increasing the user productivity. [5 Marks]
03. SmartLab is a software company that is planning to develop a commercial web tool EventX. It is a virtual conference management system that enables enterprises and organizations of any size to deploy and use video-based communication and collaboration to organize their complex events to the next level. EventX enables the organizers to cater their virtual conference to a diverse group of attendees and exhibitors with a rich environment that is mobile-friendly, fully customizable and highly interactive. It can provide a real-time chat facility through which the organizers can form lasting connections with attendees, whether through group chats or one-on-one chats with optional audio and video. Leverage the chat to answer timely questions, educate attendees, and nurture interest. Attendees can view documents and visual content in real-time, and safely download media for future reference. Multilingual Support for effortless event localization can be a value-added feature. Assume that you are the UI designer for this project.
- Design three appropriate UI paper prototype models for the project from the collaborative work perspective. [6 Marks]
 - Justify that your designs followed the UI design guidelines and principles. [4 Marks]
04. A leading medical technology company is tasked with developing a cutting-edge Virtual Reality (VR) training simulation for medical professionals learning surgical procedures. The goal is to revolutionize medical education by providing an immersive and interactive learning experience that enhances user engagement, improves learning outcomes and ensures the highest standards of patient care.
- Outline the potential for Virtual Reality (VR) to revolutionize the learning experience for medical professionals. [4 Marks]
 - Animate creative Virtual Reality (VR)/Augmented Reality (AR) interactive device and appropriate UI as a step forward towards revolutionizing medical training. [6 Marks]

05. You are a UX researcher conducting a heuristic evaluation of a mobile shopping website [10] provided below.



- i. Describe how you would use the heuristic evaluation process for evaluating this ecommerce shopping website including selecting appropriate heuristics techniques to evaluate, recruiting participants for the evaluation and conducting the evaluation sessions. [7 Marks]
- ii. Also, explain how the insights gained from the heuristic evaluation can enhance the app's usability and user satisfaction. [3 Marks]
06. As an HCI designer, you are involved in developing a mobile banking application that integrates Artificial Intelligence (AI) to provide personalized financial advice and assistance to users. The mobile banking app aims to cater to a diverse user base, ranging from tech-savvy millennials to older adults who may be less familiar with digital banking platforms.
- Analyze how Model Human Processor (MHP) can be utilized to differentiate the working principle between tech-savvy millennials and senior citizen when interacting with the mobile banking app. [5 Marks]
 - Devise UI design strategies considering MHP aspects, including visual design, task prioritization and ease of use to accommodate the cognitive differences between these user demographics. [5 Marks]

Section - II

Answer all questions (2 X 20 Marks = 40 Marks)

07. Rahul is a UX designer working on a food ordering app that offers a variety of menu options for users to browse and select food from various restaurants. His goal is to design the menu. He has to consider various factors such as the number of clicks or taps required to access different menu sections, the cognitive load associated with menu organization, item selection and the sequence of user actions from menu browsing to placing an order.
- Consider the interaction scenario of order placing on the app using the storyboarding technique to understand the design requirements and elaborate your findings. [8 Marks]
 - Utilize Keystroke-Level Model (KLM) to analyze the interaction task for the 'order placing' scenario. [6 Marks]
 - Design the UI utilizing the KLM to optimize the sequence of steps required to perform the associated task for novice and experienced user. [6 Marks]
08. The Olympics committee has put together a team of website designers for creating a website for the 'Paralympics 2024' games. The design team is committed to embodying accessibility and inclusivity principles to ensure that all users, including those with disabilities, can fully engage with the platform. The Olympics committee requires the design team to incorporate essential features such as alt text for images (concise description of an image), captions for videos, intuitive navigation options and assistive technologies etc for providing accessibility to all users.
- Considering this goal, elaborate on how the website team would approach the design process for user with disability to incorporate essential features recommended by the committee to create a user-friendly UI that can be accessed by users with disabilities. [6 Marks]
 - Design and customize the appropriate input and output devices that facilitate user input and output on the 'Paralympics 2024' games website. [4 Marks]
 - Design web and mobile compatible wireframes for any scenario that clearly depicts the layout and functionality of the app's primary screen with neat illustration. Detail the principles and guidelines used for your design. [10 Marks]



Final Assessment Test (FAT) - November/December 2023

Programme	B.Tech.	Semester	FALL SEMESTER 2023 - 24
Course Title	HUMAN COMPUTER INTERACTION	Course Code	CSE4015
Faculty Name	Prof. Lakshmi Harika Palivelal	Slot	D1+TD1
		Class Nbr	CH2023240100261
Time	3 Hours	Max. Marks	100

PART-A (10 X 10 Marks)**Answer all questions**

01. Imagine Guptha, a VIT student pursuing a Ph.D. in Quantum Computing, is preparing for his comprehensive doctoral exams, which involve recalling intricate theories, algorithms, and experimental results. He needs to memorize a vast amount of information to succeed. Discuss how the different types of human memory play a crucial role in Guptha's research and how he might leverage each type to his advantage in managing and applying intricate technical knowledge. [10M] *[Human memory - mod1]*
02. A financial institution is looking to upgrade its online banking system to enhance customer experience and offer new features to stay competitive in the market. [10]
 i) In the context of upgrading a financial institution's online banking system to enhance customer experience and offer new features for staying competitive in the market, can prototyping alone be relied upon to comprehensively address all the potential limitations associated with user interface design and system functionality? Justify it. [5M]
 ii) How would you apply Dynamic Systems Development Method (DSDM) in this scenario to develop and implement the upgraded online banking system while ensuring compliance with industry regulations and delivering value to both the financial institution and its customers? [5M]
03. Imagine a scenario , you are working with a keyboard and currently, the 'Shift' key on a keyboard is situated 2.5 inches away from the nearest letter key. A proposal has been made to relocate the 'Shift' key to a more convenient position just above the letter keys, reducing the distance to 1.5 inch. The width of the 'Shift' key is 0.635 cms. Take the constant value for the given task: 100 ms/bit. *(Module: 4)*
 i) Estimate the time savings that could be achieved by relocating the 'Shift' key based on the Model Human Processor (MHP) principles. [5M]
 ii) Discuss the potential benefits of the proposed relocation in the context of MHP principles. [5M]
04. Solve a keystroke-level analysis for opening an application in a visual desktop interface using a mouse as the pointing device. Compare three different methods which is given below for performing the task. Repeat the exercise using a trackball. Test how the analysis would differ for various positions of the trackball relative to the keyboard and for other pointing devices.
 For each method , calculate the total time in seconds *(Module: 4)*
 I. Double clicking on application icon
 II. Using an accelerator key

III. Using the menus [10M]

05. You are tasked with redesigning the Zomato application to improve the user experience and ensure users can recover from inadvertent actions or mistakes while using the app. [10]
i) Apply Jakob Nielsen's principles of user interface design into the redesign of the Zomato application to make it more user-friendly and intuitive for restaurant-goers while maintaining the flexibility for exploring a wide range of dining options and cuisines? [5M]
ii) Implement suitable mechanisms in the Zomato application to allow users to recover from unintended actions, such as accidentally placing an order, and ensure their dining preferences and order history are preserved, all while upholding the integrity of the app's restaurant listings and reviews? [5M] (Mod:6)
06. Imagine you are tasked with designing a model for a complex manufacturing process in a high-tech production facility. The process involves multiple steps and resource allocations. [10]
i) Demonstrate, step by step, how you would use Petri net modeling techniques to represent and optimize the manufacturing process for efficiency and reliability. [4M]
ii) What specific elements or notations would you include in your Petri net design to ensure that the manufacturing steps, resources, and dependencies are accurately represented and can be analyzed effectively with a neat sketch? [6M]
07. Yahoo is upgrading its email service by integrating advanced groupware features into Yahoo Mail to enhance collaboration and communication for its users. [10]
i) How would you recommend to implement groupware features into Yahoo Mail to enhance collaboration and communication for its users? [5M]
ii) Identify the potential challenges Yahoo might encounter during the implementation of these groupware features, and apply Human-Computer Interaction (HCI) principles to ensure a seamless transition for their users. [5M]
08. A leading VR development company is working on a project to create an immersive training simulation for medical professionals. The simulation involves intricate surgery procedures and medical diagnoses in a virtual hospital environment. They need to ensure that the devices used for movement, interaction, and visualization provide a lifelike experience for trainees. [10]
i) In the context of creating an immersive medical training simulation, how would you leverage the various VR and AR devices mentioned to enhance the trainees' experience? [5M]
ii) Provide specific examples of how head-mounted displays, motion controllers, room-scale tracking, and other technologies can be integrated to make the simulation both informative and engaging for medical professionals. [5M] (Mod:2)
09. With the aim of guaranteeing the usability and interface quality of a mobile banking application within a reputable financial sector: (mod 6) [10]
i) The application undergoes usability testing over a month. In the first week, 100 users attempt to set up recurring payments, and 80 of them successfully complete the task. Over the next three weeks, 20 users return to the application to perform the same task, but only 15 of them succeed without errors. Calculate both the Retention Rate and Task Success Rate based on this scenario. [5M]
ii) Could you provide an example of a potential usability or interface issue that you anticipate might arise during testing, and how you would address it to improve the app's quality and user satisfaction? [5M]

10. A university is considering implementing a voice and natural language interaction system to [10] assist college students in various aspects of their academic and campus life, leveraging the latest trends in Human-Computer Interaction.

i) Apply recent trends in Human-Computer Interaction (HCI) to enhance the user experience when developing a voice and natural language interaction system for college students. Provide examples of implementing personalized learning support, enabling voice-based access to academic resources, and offering campus navigation assistance. [5M]

ii) Examine the key considerations and strategies for designing a successful medical training simulation system for college students.[5M]

