



Kasarani Campus
Off Thika Road
Tel. 2042692 / 3
P. O. Box 49274, 00100
NAIROBI
Westlands Campus
Pamstech House
Woodvale Grove
Tel. 4442212
Fax: 4444175

KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2024/2025 ACADEMIC YEAR
SEMESTER EXAMINATION
FOR THE BACHELOR OF BUSINESS AND INFORMATION TECHNOLOGY
KBI 2210 – USER INTERFACE DESIGN AND PROGRAMMING

Date: 09TH December 2024

Time: 11:30AM – 1:30PM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) A company is developing a virtual reality (VR) training program for medical students to simulate surgical procedures.
- i) Using 2 relevant examples discuss the challenges involved in designing interaction systems for VR environments to ensure realistic and intuitive user interactions. (6 Marks)
 - ii) Using 3 relevant examples discuss the benefits of designing interaction systems for VR environments to ensure realistic and intuitive user interactions. (6 Marks)
- b) A software development company is tasked with designing a human-computer interface (HCI) for blind users to navigate and interact with a new mobile application independently. The interface should enable users to access various features, including reading text, navigating menus, and interacting with multimedia content.
- i) Discuss 2 challenges the developer is likely to encounter in designing an HCI for blind users? (4 Marks)
 - ii) Using 2 examples discuss how the development team can ensure that the interface is accessible and user-friendly for individuals with visual impairments? (4 Marks)
 - iii) List and explain 3 assistive technologies that can be incorporated into the HCI to enhance usability and functionality for blind users? (6 Marks)
 - iv) Using 2 examples discuss how the user testing and feedback can be used to iteratively improve the accessibility and usability of the HCI for blind users? (4 Marks)

QUESTION TWO (20 MARKS)

- a) A car manufacturer is incorporating voice-activated controls and gesture recognition technology into its vehicles' infotainment systems.
- i. Using 3 relevant examples, discuss the human factors and ergonomic considerations that should be considered to ensure safe and distraction-free interactions for drivers and passengers? (6 Marks)
- b) You are a healthcare IT consultant tasked with designing HCI solutions for electronic health record (EHR) systems.
- i) Discuss 2 specific uses of HCI in healthcare settings. (4 Marks)
 - ii) Using 3 relevant examples discuss how HCI can improve healthcare workflows, streamline information retrieval, and enhance communication between healthcare providers and patients. (6 Marks)
 - iii) Discuss 4 relevant impacts of HCI on patient safety, medical error reduction, and healthcare outcomes. (4 Marks)

QUESTION THREE (20 MARKS)

- a) A technology company is developing a specialized HCI for individuals with motor impairments to interact with computers and assistive devices. The interface should accommodate a range of input methods, including touchscreens, voice commands, and alternative input devices.
- i. Discuss any 2 challenges faced by individuals with motor impairments in using traditional computer interfaces? (4 Marks)
 - ii. Using 3 examples, discuss how the HCI can be designed to accommodate different levels of motor function and accessibility needs? (6 Marks)
 - iii. Explain 2 features and customization options that should be incorporated into the interface to support users with diverse abilities and preferences? (4 Marks)
 - iv. Using 3 relevant examples, discuss how usability testing and user feedback be used to evaluate and improve the effectiveness of the HCI for people with special needs? (6 Marks)

QUESTION FOUR (20 MARKS)

- a) A toy company is developing a child-friendly HCI for a new interactive learning device aimed at preschool-aged children. The interface should be engaging, intuitive, and easy for young children to understand and navigate independently.
- i. Using 2 examples, discuss 5 factors that should be considered when designing a human-computer interface for young children? (4 Marks)
 - ii. Using 3 examples, explain how can HCI incorporate age-appropriate visual and auditory cues to guide children's interactions and learning experiences? (6 Marks)
 - iii. Using 3 examples, explain usability principles and design guidelines that should be applied to ensure that the interface is accessible and engaging for children of different ages and abilities? (6 Marks)
 - iv. Using 2 examples discuss how the HCI can be iteratively tested and refined to address usability issues and meet the developmental needs of young users? (4 Marks)

QUESTION FIVE (20 MARKS)

- a) A government agency is redesigning its website to improve accessibility for users with disabilities.
- i) Discuss 2 principles of inclusive design that should be incorporated into the interaction systems to ensure equitable access and usability for all users? (4 Marks)
 - ii) Using 3 examples, explain the concept of human perception and cognition and its significance in user interface design. (6 Marks)
 - a) List 2 examples of how knowledge of human perception can influence the design of visual elements in user interfaces. (4 Marks)
- b) Discuss 3 roles of mental models and conceptual frameworks in user interface design. How can designers leverage users' mental models to create intuitive and easy-to-use interfaces? Provide relevant examples to illustrate your points. (6 Marks)