



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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University Examinations 2024/2025

THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE BACHELOR OF BUSINESS INFORMATION TECHNOLOGY, BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY, BACHELOR OF EDUCATION SCIENCE, BACHELOR OF EDUCATION ARTS AND BACHELOR OF SCIENCE IN COMPUTER SCIENCE

CIT 3300: HUMAN COMPUTER INTERFACE

DATE: JANUARY 2025

TIME: 2 HOURS

INSTRUCTIONS: Answer question *one* and any other *two* questions

QUESTION ONE (30 MARKS)

- a. Define-the role of multi-modal interfaces in enhancing user interaction (3marks)
- b. Describe why it is a good practice to use standards and guidelines when designing an interface for the users (3marks)
- c. Differentiate formative and summative evaluation. (2marks)
- d. Differentiate functional requirements and non-functional requirements? (2 marks)
- e. Define cognitive psychology (2 marks)
- f. Identify two benefits of using open-source resources in HCI projects. (2 marks)
- g. Describe how the introduction of graphical user interfaces (GUIs) represent a paradigm shift in HCI? (3 marks)
- h. Define -task analysis? Highlight its importance in the design of user interfaces (4 marks)

- i. List any two reasons that would cause user frustration with interfaces (2 marks)
- j. Define Universal Design and how does it differs from traditional design approaches in HCI? (3marks)
- k. Define Human Processor Model and highlight it's role in interface design .(4marks)

QUESTION TWO (20 MARKS)

- a. Discuss any two challenges in designing user interfaces for virtual and . augmented reality systems? (4marks)
- b. Discuss how mobile interface design differs from desktop interface design. What are some key considerations when designing for mobile devices? (8 marks)
- c. User-Centered Design (UCD) is a foundational approach in Interaction Design. Discuss the UCD process and explain how it can be applied throughout the software life-cycle to improve the usability and user satisfaction of a product. Include examples to illustrate your points. (8marks)

QUESTION THREE (20 MARKS)

- a) Describe the problems that users with cognitive impairments and learning .difficulties face? (3marks).
- b) Highlight three aspects that could be taken into consideration to ensure that your interface design supports users with those impairments. (3marks)
- c) Explain the concepts of, personae and scenario development in the design process (6marks)
- d) Describe and compare the Hierarchical Task Analysis and Use Case techniques (8marks).

QUESTION FOUR (20 MARKS)

- a) Discuss the four predictions of GOMS in human computer interface (8marks)
- b) There are various prototyping techniques that can be used, ranging from low fidelity sketches to high-fidelity interactive prototypes. Discuss three prototyping techniques in HCI (6 marks)
- c) Paradigm shifts have played a crucial role in shaping the trajectory of HCI.

- d) Analyse any two major paradigm shifts in I-ICI and explain how they transformed the way users interact with technology. (6marks)

QUESTION FIVE (20 MARKS)

- a) A large company is developing a multi-modal interface that combines voice recognition, gesture controls, and touch inputs for a new smart home system. The system is intended to be universally accessible, with specific attention to users with mobility impairments, visual or hearing impairments, and cognitive challenges. The design team is also mindful of legal regulations surrounding accessibility and inclusivity.
- As an HCI specialist, analyse the key considerations the company should take into account when designing the multi-modal system to ensure it is accessible and inclusive for all users. Propose design solutions that address the needs of different user groups and discuss the potential legal and ethical challenges that may arise during the development of this system. (10 marks)
- b) Discuss any three challenges of using speech recognition (6marks)
- c) Briefly define two approaches of user support (4marks)