



“Investing in Africa’s future”

COLLEGE OF ENGINEERING AND APPLIED SCIENCES (CEAS)

**HUMAN COMPUTER INTERACTIONS / HUMAN AI
INTERACTIONS-NCSC303, CSE211, NHAI 104**

END OF SECOND SEMESTER EXAMINATIONS

APRIL 2025

LECTURER: Prof. Yogesh Awasthi

DURATION: 3 HOURS

INSTRUCTIONS

Answer the question as per the instructions given in the sections

Start **each** question on a new page on your answer sheet.

The marks allocated to **each** question are shown at the end of the section.

Section A (20 Marks)

Q.1 Choose the correct or the best alternative in the following: (2×10)

1. Which of the following is NOT one of Ben Shneiderman's Eight Golden Rules of User Interface Design?
 - a) Strive for consistency
 - b) Offer informative feedback
 - c) Use technical jargon
 - d) Permit easy reversal of actions
2. What is the primary goal of Usability Engineering (UE)?
 - a) To make systems visually appealing
 - b) To ensure systems are easy to use and effective
 - c) To reduce the cost of development
 - d) To increase system complexity
3. Which of the following is a principle of Norman's Seven Principles of Design?
 - a) Increase task complexity
 - b) Hide system status
 - c) Simplify task structures
 - d) Avoid mapping
4. What does the term "User-Centred Design (UCD)" emphasize?
 - a) Designing for developers
 - b) Designing for end-users
 - c) Designing for managers
 - d) Designing for marketing teams
5. Which of Nielsen's Heuristics focuses on "Recognition rather than recall"?
 - a) Visibility of system status
 - b) User control and freedom
 - c) Consistency and standards
 - d) Flexibility and efficiency of use
6. What is the main purpose of a Cognitive Walkthrough?
 - a) To evaluate the visual design of a system
 - b) To assess how easily users can learn to use a system
 - c) To measure system performance
 - d) To test system security
7. Which of the following is an advantage of the Contextual Inquiry method?
 - a) It is less time-consuming than other methods
 - b) It provides deep insights into user behavior in their natural environment
 - c) It does not require interaction with users
 - d) It focuses only on system performance
8. What does the "Gulf of Execution" refer to in HCI?
 - a) The difficulty users face in understanding system feedback.
 - b) The difficulty users face in performing actions to achieve their goals.
 - c) The time delay between user input and system response.
 - d) The system's ability to prevent errors.
9. Which of the following is NOT a part of the Usability Engineering lifecycle?
 - a) Requirements gathering
 - b) User testing
 - c) System marketing
 - d) Iterative design

10. What does the heuristic "Aesthetic and minimalist design" focus on?
- a) Adding more features to the system
 - b) Reducing unnecessary elements in the interface
 - c) Increasing system complexity
 - d) Using bright colors in the interface

Section B (40 Marks)

Q2. Answer any Five questions from Section B. (8×5=40)

- a. Why is Usability Engineering essential in designing user-friendly systems? Provide two key reasons.
- b. Identify and explain three core principles from Norman's Seven Principles for user interface design with real-world examples.
- c. Outline the main steps in the User-Centred Design (UCD) methodology and explain their significance.
- d. What are the key advantages of using Contextual Inquiry for usability studies? Discuss with examples.
- e. Compare and contrast a Heuristic Evaluation and a Cognitive Walkthrough, highlighting their key differences.
- f. How can Gulf of Execution and the Gulf of Evaluation gaps be minimized for better user experience?

Section C (40 Marks)

Q3. Answer any two questions from Section C. (20×2=40)

- a. Conduct a Heuristic Evaluation of a popular application (e.g., Google Maps) using Nielsen's Ten Heuristics. Provide examples of how the application adheres to or violates these heuristics.
- b. **Case Study: Enhancing the Accessibility of a University Learning Portal**

A university has received complaints from students with disabilities regarding the accessibility of their online learning portal. Some students struggle to navigate the interface due to poor contrast, lack of screen reader compatibility, and complex navigation structures. The administration decides to implement changes to make the system more inclusive for all users. Answer these questions

- i. What accessibility guidelines should the university follow to improve the learning portal?
 - ii. How can User-Centred Design (UCD) principles be applied to make the portal more accessible?
 - iii. Suggest three specific interface improvements based on usability best practices.
- c. Draw the Users Mental Model for a Transfer of Money from one account to another on an ATM.

END OF PAPER