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(Knowledge for Development)

KIBABII UNIVERSITY

(KIBU)

UNIVERSITY EXAMINATIONS
2024/2025 ACADEMIC YEAR

END OF SEMESTER EXAMINATION
YEAR THREE SEMESTER TWO EXAMINATIONS
FOR THE DEGREE OF BACHELOR OF SCIENCE
IN
(INFORMATION TECHNOLOGY)

COURSE CODE : BIT 324/CSC 323
COURSE TITLE : HUMAN COMPUTER INTERACTION

DATE: 22/04/2025 TIME: 11.00 AM – 1.00 PM 2HRS

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE (COMPULSORY) [30 MARKS]

- a) Define the following terms as used in Human-Computer Interaction (HCI):
- i) Affordance [1 mark]
 - ii) Cognitive Load [1 mark]
 - iii) Usability Testing [1 mark]
 - iv) Heuristic Evaluation [1 mark]
- b) Explain two reasons why the role of cognitive science is essential in HCI. [2 marks]
- c) Discuss the importance of mental models in user interface design. [2 marks]
- d) Differentiate between physical ergonomics and cognitive ergonomics, providing one example for each. [4 marks]
- e) Explain two ways in which context-aware computing influences interface design. [2 marks]
- f) Describe how Shneiderman's 8 Golden Rules of Interface Design contribute to user-friendly systems. [4 marks]
- g) Identify and explain two accessibility guidelines that should be followed when designing interfaces for users with disabilities. [2 marks]
- h) Describe two key challenges associated with designing interfaces for emerging technologies such as Virtual Reality (VR) and Augmented Reality (AR). [2 marks]
- i) Explain how wireframing and prototyping contribute to human-centered software development. [4 marks]
- j) Describe the role of task analysis in developing user-centered applications. [2 marks]
- k) Outline two key differences between usability testing and A/B testing. [2 marks]

QUESTION TWO [20 MARKS]

- a) Discuss four cognitive principles that influence user interaction with computer systems. [4 marks]
- b) Explain the importance of user personas in interface design. [4 marks]
- c) Compare command-line interfaces (CLI) and graphical user interfaces (GUI), highlighting two advantages of each. [4 marks]
- d) Describe the concept of heuristic evaluation and explain its role in usability testing. [4 marks]

- e) Explain how repetitive stress syndrome affects users and how designers can mitigate it.

[4 marks]

QUESTION THREE [20 MARKS]

- a) Differentiate between user-centered designs (UCD) and system-centered design (SCD).

[4 marks]

- b) Describe the GOMS model and its significance in evaluating user interaction. [4 marks]

- c) Discuss the benefits and limitations of touchscreen interfaces compared to traditional input methods. [4 marks]

- d) Explain two reasons why alternative input devices such as eye-tracking systems are gaining popularity in HCI. [4 marks]

- e) Describe how usability testing can be used to refine software products. [4 marks]

QUESTION FOUR [20 MARKS]

- a) Explain the importance of human factors in designing interfaces for mobile applications.

[4 marks]

- b) Discuss two key differences between usability and user experience (UX) in interface design.

[4 marks]

- c) Describe three challenges encountered when designing applications for virtual reality environments.

[4 marks]

- d) Explain the significance of accessibility regulations such as WCAG in HCI. [4 marks]

- e) Discuss how emerging trends in HCI, such as wearable computing, are shaping user interaction.

[4 marks]

QUESTION FIVE [20 MARKS]

- a) Explain the role of wireframing in the software development lifecycle. [4 marks]

- b) Differentiate between explicit and implicit feedback in interface design. [4 marks]

- c) Discuss the impact of AI-driven chatbots on user interaction in modern applications.

[4 marks]

- d) Describe the importance of personas and user profiling in designing interactive systems.

[4 marks]

- e) Explain how inclusive design ensures that interfaces cater to a diverse range of users.

[4 marks]