



MACHAKOS UNIVERSITY

University Examinations for 2022/2023 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

THIRD YEAR SECOND SEMESTER EXAMINATION FOR
BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SCO307 HUMAN COMPUTER INTERACTION

DATE: 11/4/2023

TIME: 2:00 – 4:00 PM

Instructions

*This paper consists of **FIVE** questions.*

*Answer **QUESTION ONE** and other **TWO** questions in this paper.*

QUESTION ONE (COMPULSORY 30 MARKS)

- (a) Explain the term efficiency as used in Human Computer Interaction. (2 marks)
- (b) Psychologists form part of user interface development team. Outline three types of human memory they consider when designing an interface. (3 marks)
- (c)
 - (i) Explain **three** disadvantages of using metaphors in a user interface. (6 marks)
 - (ii) John, a user interface expert grouped objects together. Explain **two** factors likely to have influenced this grouping. (4 marks)
- (d)
 - (i) Norman's conceptual model influences the design of user interfaces. Describe **two** parts of this model. (4 marks)
 - (ii) Mary created a user interface using Scheiderman's heuristics. Explain **three** heuristics she could have used. (6 marks)
- (e) A unit's registration form consists of two labels and two textboxes to hold student registration number and name respectively. A combobox to display the course, option button for the semester, two check boxes to choose the units and a submit button. Using Visual Basic environment draw this form. (5 marks)

QUESTION TWO (20 MARKS)

- (a) Explain each of the following terms as used in Human Computer Interface:
 - (i) Affordance (2 marks)
 - (ii) Safety. (2 marks)
- (b) Describe an approach used to incorporate each of the following in a user interface.
 - (i) Recover from error; (2 marks)
 - (ii) Easy reversal of actions. (2 marks)
- (c) A Student Management System uses a hybrid of interactions styles. Describe three of such styles. (6 marks)
- (d) Justify the use of each of the following types of user support.
 - (i) Online help; (2 marks)
 - (ii) Activity specific help; (2 marks)
 - (iii) User training. (2 marks)

QUESTION THREE (20 MARKS)

- (a) State the Fitt's law as applied in user interface design. (2 marks)
- (b)
 - (i) Students in a certain college have been complaining about eye strain as they use computers in their laboratory. Explain two possible causes of this eye strain. (4 marks)
 - (ii) Explain **two** adaptations in a computer mouse that makes it suitable for data entry. (4 marks)
- (c) A student created a user interface for a local bank. Explain **two** highlighting techniques she could have used. (4 marks)
- (d) A University has acquired a biometric system for use by visitors at its gate. Outline **two** considerations the University could have put in place to take care of each of the following:
 - (i) Physically challenged (2 marks)
 - (ii) Visually impaired (2 marks)
 - (iii) Mentally impaired (2 marks)

QUESTION FOUR (20 MARKS)

- (a) Outline two activities considered in a conceptual model of a user interface. (2 marks)
- (b) A student used the statement MsgBox("Are you sure you want to quit this program?", "Exit", VbYesNoCancel). Sketch the output generated when this statement is executed. (4 marks)
- (c)
 - (i) Outline two reasons for using colour in a user interface. (2 marks)
 - (ii) Hard copy is one of outputs produced by a computer. Describe two page orientation used in such outputs. (4 marks)
- (d)
 - (i) Jane would like to evaluate a new user interface. Explain two methods she could use. (4 marks)
 - (ii) Distinguish between *ubiquitous computing* and *pervasive computing*. (4 marks)

QUESTION FIVE (20 MARKS)

- (a) Outline four steps in a user interface design process. (4 marks)
- (b) Mary used prototyping to develop a new system. Explain three benefits she could accrue from this method. (6 marks)
- (c) A student incorporated a lot of scrolling objects at the upper side of a user interface. Explain **two** effects these objects are likely to have on the effectiveness of the interface. (4 marks)
- (d) Human Computer Interaction design is focused on the user. Describe **three** types of individual differences considered during this design. (6 marks)