



MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

THIRD YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SCO 307: HUMAN COMPUTER INTERACTION

DATE: 9/12/2021

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) Outline **four** human factors considered when developing a user interface. (4 marks)
- (b)
 - (i) Use of colour in an interface affects user's perception. Explain two aspects of colour considered when creating an interface. (4 marks)
 - (ii) James created a usable user interface. Outline **three** characteristics of such an interface. (3 marks)
- (c)
 - (i) Explain the effect of short-term human memory on the design of a user interface. (2 marks)
 - (ii) John, a user interface expert grouped objects together. Explain **two** factors likely to have influenced this grouping. (4 marks)
- (d)
 - (i) Distinguish between *affordance* and *efficiency* as used in HCI. (4 marks)
 - (ii) Jane developed a menu-based user interface, describe **two** types of menu she could have included in the interface. (4 marks)
- (e) An inventory control system's interface has two textboxes one to display an item number and the other the item name, three option buttons to display quantity (500g, 1kg and 5kg), a combo box to select the mode of payment (Cash, M-Pay or E-pay) and a command button for saving. Using Visual Basic environment sketch the interface and use appropriate labels. (5 marks)

QUESTION TWO (20 MARKS)

- (a) Explain two types of user support carried out when a new system is installed. (4 marks)
- (b) A student created a user interface for a farmers' SACCO. Outline two ways she could incorporate each of the following heuristics.
 - (i) Visibility of system status; (2 marks)
 - (ii) Easy reversal of errors; (2 marks)
 - (iii) If everything else fails, standardize. (2 marks)
- (c) With the aid of an example in each case, distinguish between *virtual* and *composite* metaphors as used in HCI. (6 marks)
- (d) Touch screen has become an input device of choice on modern gadgets. Explain two challenges associated with it. (4 marks)

QUESTION THREE (20 MARKS)

- (a) State the Fitt's law applied in user interface design. (2 marks)
- (b)
 - (i) A newly designed game machine has been released to the market. Outline **four** considerations that could have been made to make it comfortable for use. (4 marks)
 - (ii) Explain **two** factors that make a computer mouse a suitable input device. (4 marks)
- (c) A university has admitted a blind student to pursue computer science. Outline **four** adaptations that needs to be made on the student's computer to facilitate his learning. (4 marks)
- (d) A user interface development team requires input from various fields of study. Describe **three** such fields. (6 marks)

QUESTION FOUR (20 MARKS)

- (a) Define the term usability as used in Human Computer Interface. (2 marks)
- (b) A student developed a command-based user interface for end users. Explain **two** challenges these users are likely to face. (4 marks)
- (c)
 - (i) Outline two ways that the legibility of numbers could be improved in printed report. (2 marks)
 - (ii) A computer technician advised a student to acquire a page printer instead of a character printer. Explain **two** reasons that could have informed this advice. (4 marks)

- (d) (i) Outline **two** ways that could be used to improve users' attention in an interface. (2 marks)
- (ii) You have been contracted to develop a user interface for online voting system. Explain **three** good practices you are likely to incorporate in the interface to minimize errors. (6 marks)

QUESTION FIVE (20 MARKS)

- (a) Outline **four** guiding questions in understanding the user of a system interface. (4 marks)
- (b) John, an Information Technology student would like to develop a website for a business. Advise him on three navigation tools he should include in the website. (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 user. (4 marks)
- (d) Human Computer Interaction design is focused on the user. Explain **two** ways that as an expert you can take care of each of the following groups of users.
- (i) Children (2 marks)
 - (ii) Young female (2 marks)
 - (iii) Middle aged men (2 marks)