



MACHAKOS UNIVERSITY

University Examinations for 2020/2021

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

THIRD YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (MATHEMATICS AND COMPUTER SCIENCE)

SCO307 HUMAN COMPUTER INTERACTION

DATE: 13/8/2021

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** goals of human computer interaction. (2 marks)
- b) Machakos University intends to create a usable system. Outline **three** characteristics of such a system. (3 marks)
- c)
 - (i) Explain the effect of each type of human memory to the design of a user interface. (6 marks)
 - (ii) John, a user interface expert group objects together. Explain **two** factors likely to have influenced this grouping. (4 marks)
- d)
 - (i) Distinguish between *gulf of evaluation* and *gulf of execution* as used in HCI. (4 marks)
 - (ii) Mary, intends to develop a user interface for a hospital. Explain **three** design consideration she could make during the development. (6 marks)
- e) An inventory system interface has two textboxes one to display the code of an item and the other name of the item, three option buttons to display quantity (500g, 1kg and 5kg) and command button for saving. Using Visual Basic environment draw this form and use appropriate labels. (5 marks)

QUESTION TWO (20 MARKS)

- a) Explain each of the following types of metaphors:
 - (i) Virtual; (2 marks)
 - (ii) Composite. (2 marks)
- b) Describe two approaches used to ensure each of the following in a user interface.
 - (i) Visibility of system status; (2 marks)
 - (ii) Match between the system and reality. (2 marks)
- c) A new supermarket would like to acquire an inventory control system. Describe **three** interaction styles that could be included in the system. (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 applied in user interface design. (2 marks)
- b)
 - (i) A secretary has been experiencing back pains due to long hours of computer use. Outline **four** precautions she could take to minimize the occurrence of the pains. (4 marks)
 - (ii) Describe **two** settings that could be adjusted on a computer monitor to reduce eye strain. (4 marks)
- c) Explain **two** adaptations on a computer keyboard that makes it suitable for use. (4 marks)
- d) A University has acquired a biometric system for use by visitors at its gate. Outline **two** considerations the developer could put in place to take care of each of the following:
 - (i) Physically challenged; (2 marks)
 - (ii) Visually impaired; (2 marks)
 - (iii) Short. (2 marks)

QUESTION FOUR (20 MARKS)

- a) Define the term affordance as used in Human Computer Interface. (2 marks)
- b) Peter developed a user interface that was using cognition. Explain **two** tools he could have used to encourage this. (4 marks)
- c)
 - (i) A student used colour coding in a user interface. Outline **two** importance of this coding. (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) A student management system in a university requires students to register for units at the beginning of each semester. Explain **three** good practices that could have been incorporated in the system to minimize errors. (6 marks)

QUESTION FIVE (20 MARKS)

- a) State a metaphor that could be used in a user interface to indicate each of the following:
- (i) Hotel;
 - (ii) Petro station;
 - (iii) Camp site;
 - (iv) Narrow bridge. (4 marks)
- b) Zack intends to evaluate a university website. Explain **three** methods he could use for this task. (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. Describe **three** types of individual differences considered during this design. (6 marks)