



# MACHAKOS UNIVERSITY

University Examinations for 2022/2023

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (CLOUD COMPUTING AND INFORMATION SECURITY)

BACHELOR OF SCIENCE (MATHEMATICS & COMPUTER SCIENCE)

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SCO307: HUMAN COMPUTER INTERFACE

SIT308: HUMAN COMPUTER INTERACTION

DATE:

TIME:

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## INSTRUCTIONS

*This paper consists of FIVE questions*

*Answer **question one** and other **two** questions in this paper*

### QUESTION ONE (COMPULSORY) (30 MARKS)

- (a) (i) Explain universal design as used in Human Computer Interaction. (2 marks)
- (ii) Explain **two** principles of universal design. (4 marks)
- (b) Outline **three** challenges of speech recognition user interface. (3 marks)
- (c) Individual differences inform the design and implementation of a user interface. Outline **three** types of these differences. (4 marks)
- (d) Explain **two** ways through which each of the following could be achieved in a user interface.
- (i) Error tolerance (2 marks)
- (ii) Flexibility of use. (2 marks)
- (e) Mark, a user interface professional intends to design a user interface. Outline **two** adaptations he will use for each of the following special users.
- (i) Visually impaired; (2 marks)
- (ii) Physically challenged. (2 marks)
- (f) Describe **two** types of colours used in a user interface. (4 marks)

- (g) A county service board uses a form to capture the details of jobs applicants. The form contains: A picture box for applicant's photo, two text boxes to hold national identification number and name of the applicant, option buttons to select gender, a combo box to select position applied and a submit button.

Draw the form as it would appear on a web browser. (5 marks)

### QUESTION TWO (20 MARKS)

- (a) Explain **two** methods used in evaluating a user interface. (4 marks)
- (b) Job include menu in a user interface. Describe **three** types of menus he could have used. (6 marks)
- (c) A project team tasked with the design and implementation of a user interface consists of experts from various fields. Describe **three** experts in such a team clearly indicating their role. (6 marks)
- (d) Touch screen has become the preferred input device. Explain **two** reasons that could have led to this preference. (4 marks)

### QUESTION THREE (20 MARKS)

- (a) (i) Outline **two** settings considered when using colour in a user interface. (2 marks)
- (ii) Distinguish between *multimodal* and *multimedia* user interfaces. (4 marks)
- (b) (i) Explain the term consistency as used in human computer interface. (2 marks)
- (ii) Describe **three** ways through which consistency is enhanced in a user interface. (6 marks)
- (c) A user interface should be designed to help users form the correct productive mental model. Explain **three** factors considered when designing such interfaces. (6 marks)

### QUESTION FOUR (20 MARKS)

- (a) State the most appropriate metaphor that could be used for each of the following:
- (i) Hospital;
- (ii) Hotel;
- (iii) Cyber Cafe;
- (iv) Police station. (4 marks)
- (b) Describe **two** methodologies used when designing a human computer interface. (4 marks)
- (c) A student analyzed a system using the experimental method. Explain **three** data collection methods he could have used. (6 marks)
- (d) A user interface uses computer keyboard for input. Describe **three** types of keyboards that could be used in the interface. (6 marks)

### QUESTION FIVE (20 MARKS)

- (a) Explain each of the following methods of testing a user interface.
- (i) Simulation; (2 marks)
- (ii) Prototyping. (2 marks)

- (b) Mark uses a printer for output in an area that requires silence.
- (i) Identify the most appropriate type of printer that he could be using. (1 mark)
  - (ii) Outline three other benefits of using the printer identified in (i) (3 marks)
- (c) James, computing student trained users on a new system. Explain **three** methods he could have used. (6 marks)
- (d) A county government disseminates information to the public through a website. Describe **three** design models that could improve users' experience. (6 marks)