LAIKIPIA UNIVERSITY

UNIVERSITY EXAMINATIONS

SECOND SEMESTER 2023/2024 ACADEMIC YEAR

THIRD YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE AND BACHELOR OF SCIENCE IN (ICT)

BICT 321/COMP 324: HUMAN COMPUTER INTERACTION

STREAM: R ***TIME: 2 HRS***

DAY: THURSDAY[11.30AM – 1.30 PM] ***DATE: 11/04/2024***

THIS QUESTION PAPER CONSISTS OF FOUR (4) PAGES

PLEASE DO NOT OPEN UNTIL THE INVIGILATOR SAYS SO.

INSTRUCTIONS: Section A is compulsory and has **30 marks**.

Attempt any **TWO** questions from Section B. Each question has **20 marks.**

Section A – 30 marks (Answer all questions)

QUESTION ONE (30 MARKS)

a) An interactive system is regarded as successful if it enhances usability. The successful interaction systems serve as paradigms for the development of future products. Describe **FIVE** paradigms for interaction **(5 Marks)**

b) With a relevant illustration, explain the meaning of the term Graphical User Interface (GU) and justify why GUI is also known a WIMP **(6 Marks)**

c) Explain **FOUR** disciplines that contribute to HCI development **(4 Marks)**

d) Discuss the challenges of designing an NLU (Natural Language Processing) system for older adults. Consider issues like speech recognition, language patterns, and understanding context. Suggest specific design solutions to overcome these challenges and improve the user experience. **(4 Marks)**

e) Explain the following terms in the context:

   i. Domain **(2 Marks)**

   ii. Task **(2 Marks)**

f) Discuss how you would evaluate the effectiveness and usability of the voice assistant for older adults. Explain **two** evaluation methods you would use and how the results would inform future iterations and improvements to the design. **(4 Marks)**

g) State

SECTION B – 40 MARKS (ANSWER ANY TWO QUESTIONS)

QUESTION TWO (20 MARKS)

a) Explain any **FIVE** usability principles to guide HCI design **(10 Marks)**

b) Explain **FIVE** different types of Human computer interfaces giving an advantages and disadvantages of each. **(5 Marks)**

c) A designer requires a window interface that can be closed in either of the two methods: by selecting the ‘close’ option from the file menu or by selecting the Ctrl key and the F4 key

together. Describe how to model the task of "closing the window" for this system using GOMS model. **(5 Marks)**

QUESTION THREE (20 MARKS)

a) Discuss **Six** steps used to develop an interactive system **(12 Marks)**

b) Outline one methodology that has been used to achieve the above (i) exercise.

(8 Marks)

QUESTION FOUR (20 MARKS)

Imagine you are tasked with designing a new mobile app for a local public transportation system in Dar es Salaam, Tanzania. This app aims to improve the user experience for commuters by providing real-time bus arrival information, route planning, and ticket purchasing functionalities.

(20 Marks)

- The primary target users are residents of Dar es Salaam who commute regularly using public transportation. This includes a diverse group of people with varying levels of tech savviness, age groups, and accessibility needs.
- Users will primarily access the app on their smartphones while on the go, waiting for buses, or planning their journeys.

QUESTION FIVE (20 MARKS)

a) Identify five key usability challenges users might face when using the app in the context of Dar es Salaam (e.g., language barriers, data limitations, accessibility concerns).

(5 Marks)

b) For each challenge identified, propose a specific design solution that addresses it and improves the app's usability. **(5 Marks)**

c) Explain how you would ensure the app is accessible to users with different disabilities, including visual impairments, motor impairments, and cognitive impairments. Provide at least two concrete examples of accessibility features you would integrate. **(5 Marks)**

d) Describe five design strategies you would employ to create a positive and engaging user experience for the app. Consider factors like motivation, feedback mechanisms, and cultural sensitivity relevant to Dar es Salaam. **(5 Marks)**

QUESTION FIVE (20 MARKS)

a) Google Maps is a well-known free service provided by Google worldwide. It's not just a bunch of maps, it includes multiple layers: roads, terrain, satellite, street view, traffic etc. It also integrates user ratings and pictures with locations and businesses in the area. Assuming that all of us have used Google maps at some point in life. Describe how you would use Nielsen's Ten Heuristics to evaluate Google Maps. **(20 marks)**