

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**FOURTH YEAR EXAMINATION FOR THE AWARD OF BACHELOR OF SCIENCE IN
COMPUTER SCIENCE AND BACHELOR OF SCIENCE IN APPLIED COMPUTER
SCIENCE**

**COSC 435: USER INTERFACE DESIGN
ACSC 435: HUMAN COMPUTER INTERFACE**

STREAMS: BSC. APPLIED COMP. SCI Y4S1

TIME: 2 HOURS

DAY/DATE: TUESDAY 23/03/2021

11.30 A.M. – 1.30 P.M

INSTRUCTIONS

1. Answer question **ONE** and any other **TWO** questions
2. Marks are awarded for clear and concise answers

SECTION A- COMPULSORY

QUESTION ONE [30 Marks]

- (a) You are tasked with designing and developing a web based application for use in a small company. Describe **TWO** benefits of employing ethnographic **approach** in the design **[4 marks]**
- (b) In the context of Graphical User Interfaces (GUIs), describe what is meant by the following terms
- (i) Windows **[2 Marks]**
 - (ii) Icons **[2 Marks]**
 - (iii) Menus **[2 Marks]**
- c) Discuss how the following cognitive psychology aspects affect human memory
- i. Attention **[2 Marks]**
 - ii. Rehearsal **[2 Marks]**

- (d) When building information systems, HCI experts recommend prototyping of the system first. There are a lot of gains to be made by using prototyping in the design stage of a project. Discuss **FOUR** such benefits [4 Marks]
- (e) Give **TWO** differences between formative and summative evaluation [4 Marks]
- (f) While describing external consistency, explain how Microsoft has applied the concept in the design of its products [4 Marks]
- (g) Command line interfaces were the first form of direct human computer interaction. They still remain powerful for some situations. Briefly describe **TWO** advantages associated with this type of interface [4 Marks]

SECTION B- ANSWER ANY TWO QUESTIONS

QUESTION TWO [20 MARKS]

You have been asked to help in the development of a new computerised call Centre. Customers from a national Bank will ring up if they wish to change the details of their account. For instance, they might want to open a new account, close an old account, they might want to change the address of the person who owns the account and so on. Briefly explain the principle strengths and weaknesses of each of the following requirements elicitation techniques to identify the potential usability problems that might arise for people working with this new system.

- (i) Questionnaires [4 Marks]
- (ii) Interviews [4 Marks]
- (iii) Focus groups [4 Marks]
- (iv) summative evaluation technique [4 Marks]
- (v) Formative evaluation technique [4 Marks]

QUESTION THREE [20 MARKS]

(a) Norman's 7 Stage model was an early attempt to model how users interact with computer systems. We now have a much better understanding of how users interact with computers. However, Norman's model still provides a good understanding of the steps undertaken at a task level. Using this model, explain **FOUR** design principles that can be used to address the issue of gulf of execution and the gulf of evaluation [8 Marks]

- (b) Environmental factors can impair users' ability to recall information that is necessary to operate complex, computer systems. Briefly explain how such disruptions can impair both short-term AND long-term memory **[6 Marks]**
- (c) Describe **THREE** design principles/techniques that designers of user interfaces can employ to overcome the problems of Short-Term Memory **[6 Marks]**

QUESTION FOUR [20 MARKS]

- a) Describe the following techniques used to evaluate a system after deployment. For each case include the weaknesses or problems associated it. **[15 Marks]**
- i. Field study
 - ii. Usability inspection
 - iii. GOMS
- b) Speech recognition challenges continue despite advances in the area of natural language processing. Describe any **FIVE** challenges associated with speech recognition systems **[5 Marks]**

QUESTION FIVE [20 MARKS]

- a) Discuss the contribution of ergonomics to the study of human-computer interaction **[4 Marks]**
- b) Briefly explain what is meant by the terms **perception, physiology** and **cognition** and the role that each plays in user interface design **[6 Marks]**
- (c) One important design consideration in the design of user interfaces is internal consistency.
- (i) Briefly describe what internal consistency means **[4 Marks]**
 - (ii) Identify **THREE** aspects of windows operating System that adhere to this principle **[6 Marks]**
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