



PAN AFRICA CHRISTIAN UNIVERSITY

BACHELOR OF SCIENCE INFORMATION TECHNOLOGY AND BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

END OF SEMESTER EXAMINATION

DEPARTMENT: COMPUTING AND INFORMATION TECHNOLOGY
COURSE CODE: BIT/BCIT209
COURSE TITLE: HUMAN COMPUTER INTERACTIONS
CAMPUS: ROYSAMBU
EXAM DATE: THURSDAY,XXXX,APRIL,2023
TIME: 5:30PM -8:30PM

INSTRUCTIONS

- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer All questions in Section **A** and any other Three questions in Section **B**.
- Write only your **student number** on the answer booklet provided.

SECTION A

(Answer ALL questions in this section)

Question 1:

a) Scrolling is an effective way means of browsing through a document in a window that is too small to show the whole document. Compare the different interactive behaviour of the following two interaction objects to implement scrolling.

Interaction 1

A scroll bar is attached to the side of the window with arrows at the top and bottom. When the mouse is positioned over the arrow at the top of the screen (which points up), the window frame is moved upwards to reveal a part of the document above/before what is currently viewed. When the bottom arrow is selected, the frame moves down to reveal the document below/after the current view.

Interaction 2

The document is contained in a textual interaction object. Pressing the mouse button in the text object allows you to drag the document within the window boundaries. You drag up to browse down in the document and you drag down to browse up.

Required:

- i. With respect to manipulation, state the difference between the two interaction objects. **[2 Marks]**
 - ii. Explain the usability principles that you will use to justify one method over the other; consider the case when you want to scroll from side to side as well as up and down. **[2 Marks]**
- b) Study the following diagram of Seeheim user interface architecture.

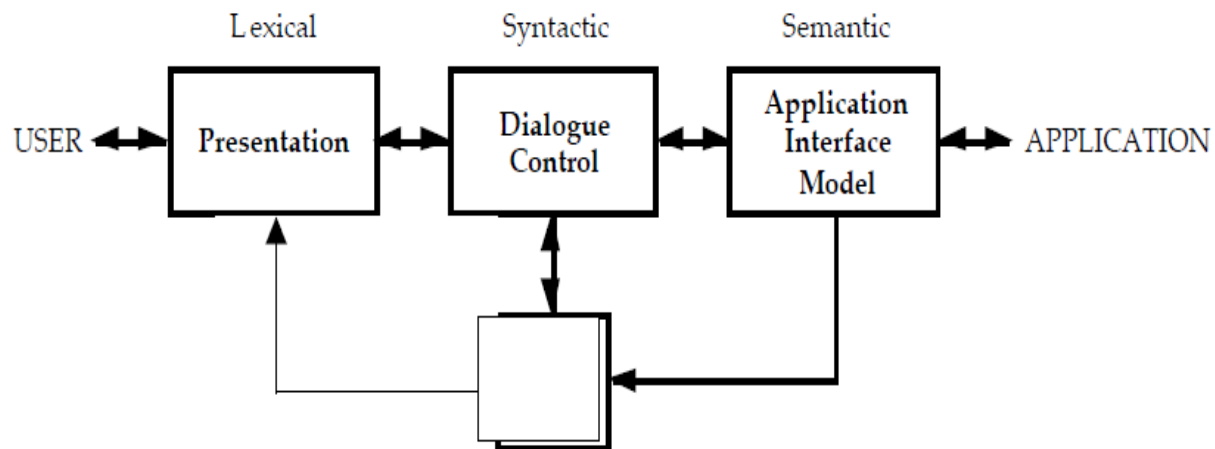


Figure 2.1 Seeheim model

- Describe the function of the three main boxes. **[3 Marks]**
- The lower unlabelled box is called "the switch", define its importance. **[1 Mark]**

c) Highlight two added advantages of using non-speech sounds in a human computer interface. **[2 Marks]**

SECTION B
(Answer any THREE (3) questions in this section)

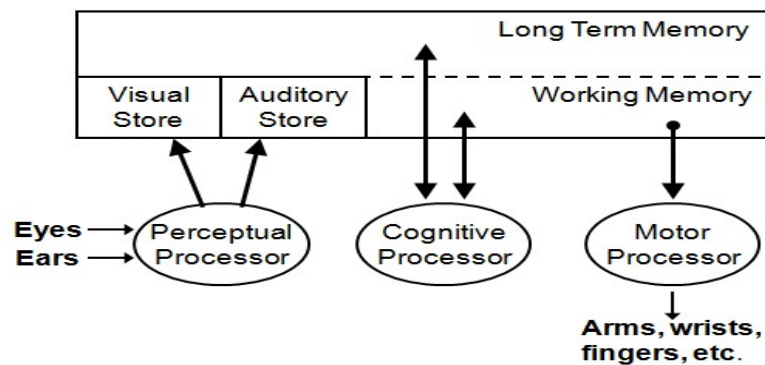
Question 2:

a) Cognition is the process by which we gain knowledge. Explain with examples how the processes which contribute to cognition improve human computer interaction in a computer based system. **[4 Marks]**

b) XYZ University accounts department is designing a database entry screen. The screen will display a form consisting of a large number of text boxes. The information to be entered will be in several categories, including personal details, account details and transaction information. Discuss three ways in which the Gestalt Laws of Perceptual Organization could be applied to enhance the usability of this screen. **[6 Marks]**

Question 3:

a) Study the following diagram of Model Human Processor. Use it to answer the questions that follow.



i. Describe the function of the three main components of the model. **[3 Marks]**

ii. State the importance of the above model. **[1 Mark]**

b) Use a mobile money transfer of your choice and describe how the system has enhanced usability. Hint, use the Shneiderman's Eight Golden Rules of Interface Design.

[6 Marks]

Question 4:

a) State the metaphor(s) used in the following types of applications:

[4 Marks]

- i. Data Storage
- ii. Spreadsheets
- iii. The Web
- iv. Online shopping

b) Closely related to mental models in human computer interactions is the idea of gulfs between the interface of a system and the users. Illustrate how both the users and the designers can overcome both the Gulf of Evaluation and the Gulf of Execution in computer systems.

[6 Marks]

Question 5:

a) List any four Jacob Nielsen's Usability Heuristics principles for Commercial Web sites.

[4 Marks]

b) Describe three populations of users with special needs. For each population, suggest two ways current interfaces could be improved to better serve them.

[6 Marks]

Question 6:

a) Describe at least two devices used for interaction with computer in the following categories:

i. Text entry devices

[2 Marks]

ii. Devices for virtual reality and 3D interaction

[2 Marks]

b) Evaluation is concerned with gathering data about the usability of a design or product by a specified group of users for a particular activity within a specified environment or work context. There are a wide range of methods which can be used for evaluation.

i. Outline two factors that need to be considered when selecting an evaluation method.

[2 Marks]

ii. Explain two of these methods.

[4 Marks]

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