



**UNIVERSITY OF COLOMBO, SRI LANKA**

**UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING**

**DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)**

**Academic Year 2017 – 2<sup>nd</sup> Year Examination – Semester 3**

***IT3405 – User Interface Design***  
**Part 2 - Structured Question Paper**

**04<sup>th</sup> June, 2017**  
**(ONE HOUR)**

**To be completed by the candidate**

BIT Examination Index No: .....

**Important Instructions:**

- The duration of the paper is **1 (one) hour**.
- The medium of instruction and questions is English.
- This paper has **3 questions** and **11 pages**.
- **Answer all questions.** All questions **do not** carry equal marks.
- **Write your answers** in English using the space provided **in this question paper**.
- Do not tear off any part of this answer book.
- Under no circumstances may this book, used or unused, be removed from the Examination Hall by a candidate.
- Note that questions appear on both sides of the paper.  
If a page is not printed, please inform the supervisor immediately.
- Calculators are **not** allowed.

**Questions Answered**

Indicate by a cross (×), (e.g. 

×
---

) the numbers of the questions answered.

To be completed by the candidate by marking a cross (×).	Question numbers		
	1	2	3
To be completed by the examiners:			

- 1) (a) Define Multimodal interaction and briefly explain three (3) reasons for using multimodal interaction.

[6 marks]

**ANSWER IN THIS BOX**

Multimodal interaction is the situation where the user is provided with multiple modes for interacting with the system. A multimodal interface provides several distinct tools for input and output of data.

Multimodal interfaces process two or more combined user input modes (speech, pen, touch, manual gesture, head & body movements) in a coordinated manner with multimedia system output.

**Reasons for using Multimodal interaction**

- To use more sensors of users
- Users perceive multiple things at once.
- Users do multiple things at once (speak & use hand gestures, body position, orientation, gaze)
- For a more holistic interaction

- (b) Read the following scenario and identify if this type of human error is a mistake or a slip. Justify your answer.

[6 marks]

*A typical Windows user is exposed to a Linux environment for the first time. He has to type a document on Emacs as opposed to his favourite Windows text editor. The user inadvertently makes a typo and without hesitating he presses the Control and the Z buttons since these are the keys he always uses as a keyboard shortcut for the UNDO command. The user gets frustrated as the Emacs editor completely disappears from the screen and he gets back to the Linux prompt with no single notification message.*

**ANSWER IN THIS BOX**

**This is a mistake.**

**The user made a mistake in this case because he has a wrong conceptual model about the UNDO command in the Linux environment. The fact that the user has been working on Windows builds a mental model for the UNDO command in almost all windows programs and associates this model with the action of pressing CTRL + Z, not knowing that these actions will cause a completely different action in Linux environment. As a result, Emacs is running as a background process and the only way to bring the Emacs to foreground to interact with it is to type "fg" at the Linux prompt.**

- (c) Define the steps in the Donald Norman's Execution/Evaluation loop and then write down which steps are responsible for Gulf of Execution and Gulf of Evaluation.

[8 marks]

**ANSWER IN THIS BOX**

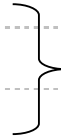
**Seven (7) stages**

- User establishes the goal

- formulates intention

- specifies actions at interface

- executes action



**Gulf of Execution**

- perceives system state

- interprets system state

- evaluates system state with respect to goal



**Gulf of Evaluation**

*Ainsoft is a company which builds gesture based interaction systems. Ainsoft is thinking of incorporating older age users (40-60) to use its gesture based interaction system which is similar to Kinect. The company is thinking of either building games or introducing related applications (e.g. work calendar, fitness, iTV etc.) for target users which they will be able to use at home.*

P = <u>People</u>	A = <u>Activity</u>	C = <u>Context</u>	T = <u>Technology</u>
<b>Age:</b> 40s to 60s	Playing games	Home	Gesture based interaction system
<b>Gender:</b> males, females	Watching tv/itv	Daytime and night time (more night time)	and a screen Wireless control
<b>Education:</b> mostly educated (mid to high), might not be too familiar with English	Accessing and checking schedule using work calendar	Noise (more or less)	Modern TV which could connect hardware components like in Kinect or a computer capable to communicate with the computer
<b>Experience:</b> might not be experienced with new technology	Using fitness app for workouts, meal plans etc.		
<b>Usability:</b> for leisure, workouts, games			
<b>Social:</b> multiusers and/or single users			
<b>Cultural:</b> universal / Multilanguage			
<b>Adaptability:</b> less adaptable to learn new technologies			

2. (a) Define User-Centred Design (UCD) and briefly explain two ends of the UCD spectrum.

[7 marks]

**ANSWER IN THIS BOX**

User-centred design (UCD) is a broad term used to describe design processes in which end-users influence how a design takes shape. It is both a broad philosophy and a variety of methods.

At one end of the spectrum, UCD consults users about their needs and involves them at specific times during the design process; typically during requirements gathering and usability testing.

At the opposite end of the spectrum there are UCD methods in which users have a deep impact on the design by being involved as partners with designers throughout the design process.

- (b) List down and briefly explain steps of a typical UCD process.

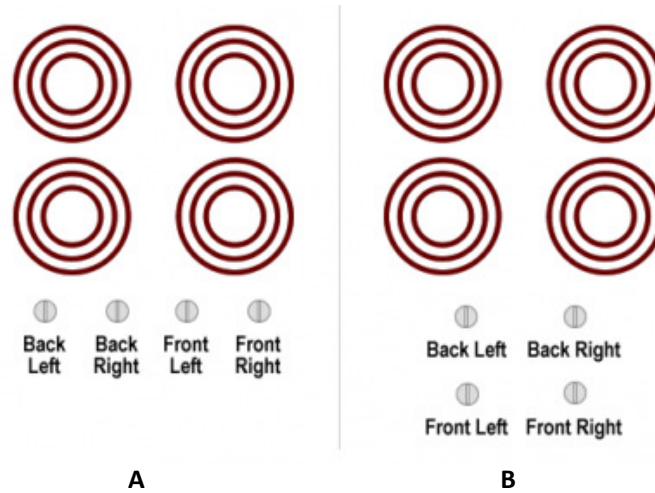
[8 marks]

**ANSWER IN THIS BOX**

1. User surveys: Knowing the nature of users and how will they use the product.
2. Analysis of user requirements: Identifying what sorts of information and functions are required by the users.
3. Prototype: Creation of a design prototype. Prototypes can be used to verify requirements with the users.
4. Assessment of usability: Assessing to what extent users are satisfied with the product.

- (c) Consider the following possible layouts (A and B) for a gas cooker design. Which design has the better *natural mapping*? Justify your answer.

[6 marks]



**ANSWER IN THIS BOX**

Choice: B

Physical layout of the dials of layout B is matching with the layout of the burners. A person can easily remember the mapping of the dials to the burners in layout B, unlike in layout A.

- (d) State **three (3)** possible ways of getting users involved in a design. Explain the purpose of each of them.

[9 marks]

**ANSWER IN THIS BOX**

**Background Interviews and Questionnaires:**

Collecting data related to the needs and expectations of users; evaluation of design alternatives, prototypes and the final artefact

**Sequence of work interviews and questionnaires:**

Collecting data related to the sequence of work to be performed with the artefact

**Focus groups:**

Include a wide range of stakeholders to discuss issues and requirements

**On-site observation:**

Collecting information concerning the environment in which the artefact will be used

**Role Playing, walkthroughs, and Simulations:**

Evaluation of alternative designs and gaining additional information about user needs and expectations; prototype evaluation

**Usability testing:**

Collecting quantities of data related to measurable usability criteria

**Interviews and questionnaires:**

Collecting qualitative data related to user satisfaction with the artefact

OR any other plausible technique with a proper justification



3. Consider the following screenshot of a webpage in a website of a company that promotes online selling of coffee products.

Want to save on \*bucks in the office?  
Like it served instantly, hot and best quality at a lower price?  
Try Instant KONA COFFEE - freeze dried granulated.  
The worlds most expensive coffee @ ~25 cents a cup.



Now available in Kona coffee sticks from 45 cents a cup.

A delicious coffee that is portable, storable AND convenient.

Simply rip a stick, pour the coffee into your favorite container, add hot water and in seconds you will be enjoying the rich fresh flavors of pure 100% Kona Coffee.

**Kona Coffee is smooth, not bitter.**

Help to fix the trade deficit and enjoy 100% USA grown COFFEE.

Support Hawaiian Coffee Farmers. Aloha and Mahalo.

- (a) What are good design considerations of this web page? List **at least two (2)**.

[6 marks]

**ANSWER IN THIS BOX**

1. The main purpose of selling the coffee is served as it is highlighted in this page.
2. Use of pictures can attract people.
3. Good use of spacing between text and pictures.

- (b) What can be considered as design errors in this web page? List **at least three (3)**.

[9 marks]

**ANSWER IN THIS BOX**

1. Too much text
2. Difficult to find clickable items.
3. Some text are too small.
4. No separators can be seen.

- (c) Identify **at least two (2)** usability issues in this web page.

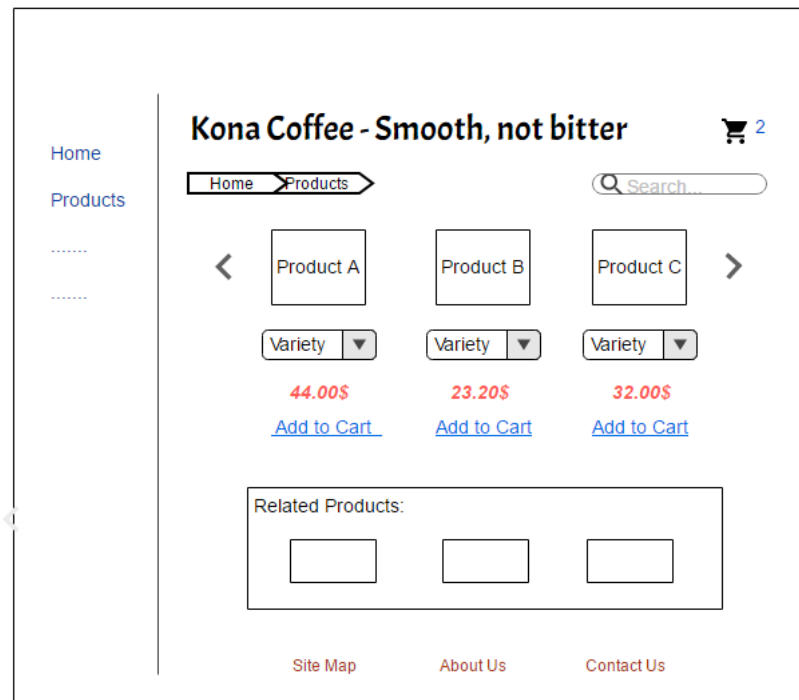
[10 marks]

**ANSWER IN THIS BOX**

1. User may find it difficult to understand where he was. Features such as breadcrumb trails are not present.
2. There seems to be no functionality to go back and forth. There are no features such as menus to navigate easily.
3. A buying functionality is unavailable this page.
4. Users are unable to see feedback when they buy a product (shopping cart is not present).

- (d) Sketch a more usable design for this web page in order to sell products. Explain usability improvements proposed in your sketch.

[15 marks]

**ANSWER IN THIS BOX**

- Included a breadcrumb trail for ease of navigation.
- Search menu to find desired product quickly.
- Shopping cart item provides an idea of current shopping status.
- User can easily browse through products.
- Left menu to jump into desired pages quickly.
- Bottom menu to access additional features/information.
- Proper use of white space and separators.
- Real time information on price of the product.
- Ability to select a variety of a product and add to cart on the go.

\*\*\*\*\*