UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2019 – 2nd Year Examination – Semester 3

IT3405 – User Interface Design

Part 2 - Structured Question Paper

30th June 2019

(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 in English.
- This paper has **2 questions** and **10 pages**.
- **Answer all questions.** All questions 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. [X]) the numbers of the questions answered.

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

1) (a) As a UI Designer, you have been asked to improve the usability of a horizontal toolbar in a word processing application. The toolbar consists of a single row of twelve 16x16-pixel icons. Write down two (2) techniques that can be used to make the toolbar faster and easier to use. Justify your answer using Fitts' Law.

[8 Marks]

ANSWER IN THIS BOX

(1) Making the individual icons bigger in the toolbar

Because Fitts' Law predicts that larger items take less time to hit.

(2) Placing the toolbar closer to where users' pointing cursors are most likely to be

Because Fitts' Law predicts that shorter movements take less time to complete.

(b) What role does attention play in human memory?

[4 Marks]

ANSWER IN THIS BOX

Attention is what is required for information to move from our sensory memory stores (image, iconic & haptic) into working memory (Short-term memory).

(c) Saduni is a novice web designer working with a new web development application for the first time. The application has a design mode and a test mode; users can only upload files to a live server when in test mode. After Saduni completes the development of her website, she tries to upload the files to the live server while in design mode and receives the following error message: "*Error: Cannot update the live server*."
What is wrong with this error message and how would you improve it?

[8 Marks]

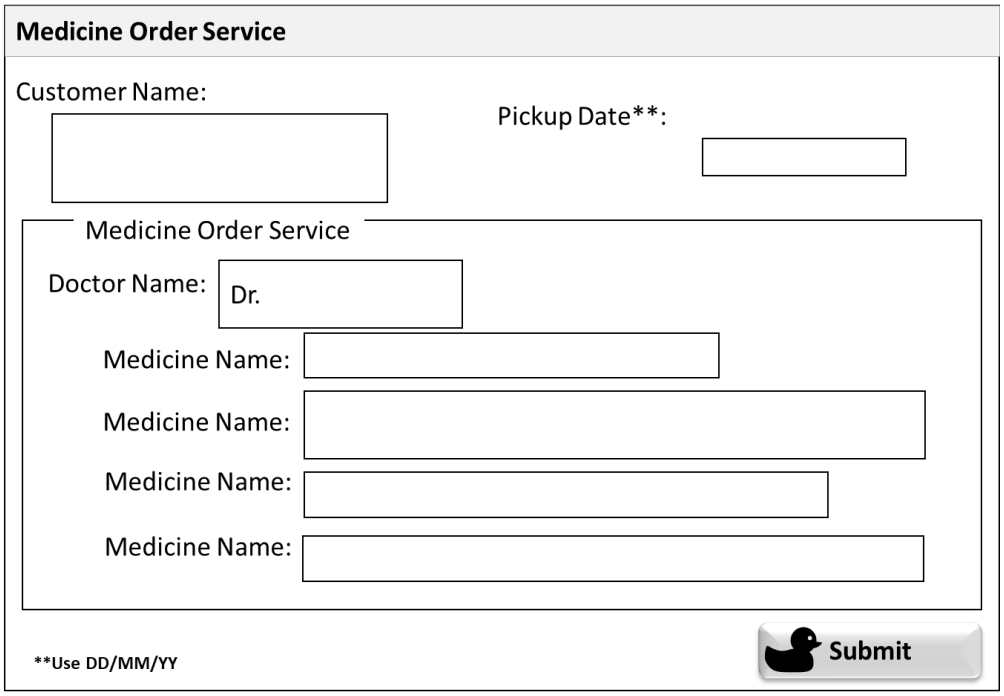
ANSWER IN THIS BOX

The error message isn't descriptive enough. Doesn't make any reference to modes of operation which is the source of error.

The application should not allow you to attempt uploading if you are in test mode.
The application could provide better text/description of the error.

E.g. "You cannot update the live server while in test mode. Please switch to design mode."

(d) Medico Pharmacy is providing online services to its customers through an online portal. One of the services is to order medicine online. Customers need to enter the medicine details and the pickup date, and they need to physically go to the pharmacy to pay and collect the medicine. The interface they have designed for this purpose is given below. Examine the interface and describe five (5) design errors with the interface.



[10 Marks]

ANSWER IN THIS BOX

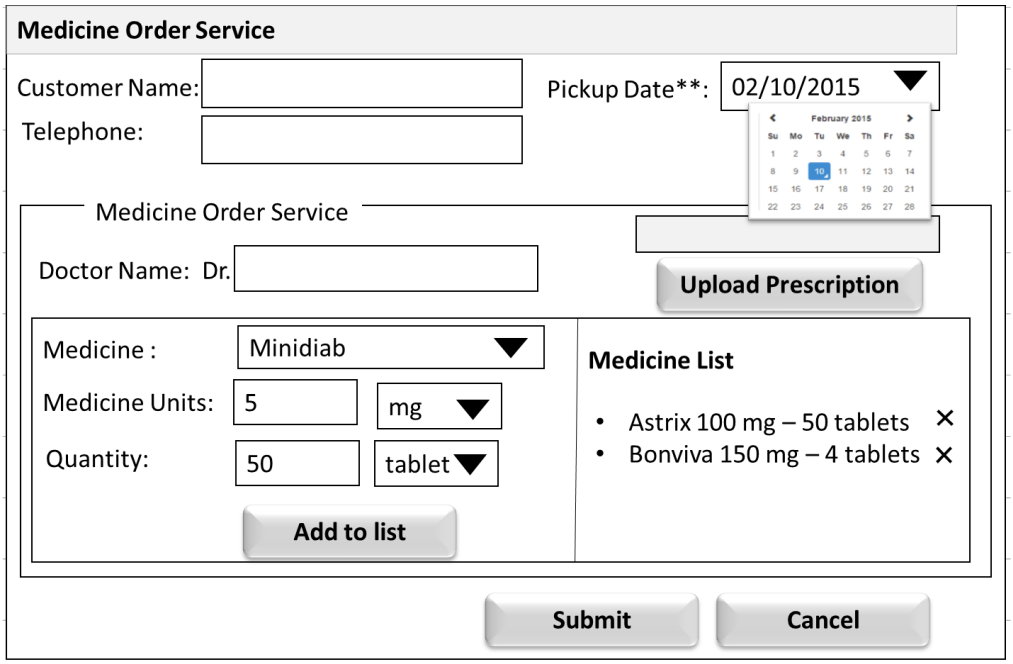
Possible answers:

- Text box sizes are not uniformed or aligned.
- The size of the box seems to have very little to do with the intended content.
- There is no possibility to select medicine from a list such as a combo box.
- Having only 4 options to enter the medicine name. Each medicine must be entered in the boxes without having the option to select and add to a list.
- No place to enter medicine units and quantity.
- No place to upload the prescription.
- The picture on the submit button only provides a distraction, has nothing to do with the interface.
- No cancel button
- The date box does not prevent errors – it has a label describing valid input that is extremely far away

(e) Sketch a new and improved interface to address the design errors that you identified in 1(d) above.
[20 Marks]

ANSWER IN THIS BOX

Sample Answer:



2) (a) Write down four (4) main differences between low-fidelity and high-fidelity prototypes?

[8 Marks]

ANSWER IN THIS BOX

Possible answers (Any 4 answers out of them)

- Low-fidelity prototypes generally considers the limited functionality and interaction. High-fidelity prototypes represent the core functionality of the products user interface.

- Low fidelity prototyping is used early in the design cycle whereas High-fidelity prototypes are often used late in the design process.

- Building high fidelity prototypes consume resources and have a high cost whereas Low fidelity prototyping is used to show general conceptual approaches without much investment in development.

- Low-fidelity prototypes are constructed to depict concepts, design alternatives, and screen layouts. They are intended to demonstrate general look and feel of the interface.
  High fidelity prototypes are fully interactive systems.

- Low-fidelity prototypes are created to educate, communicate and inform, but not to train, test or serve as a basis for which to code.
  In high fidelity prototypes users can enter data in entry fields, respond to messages, select an icon to open windows and interact with the user interface as if it were a real system.

- High fidelity prototypes trade-off speed for accuracy.

(b) Consider the following statement:
Unlike the user model, the design model is complete and accurate in interactive systems.

Is the above statement true or false? Justify your answer.

[5 Marks]

ANSWER IN THIS BOX

False

The designer normally has a better understanding of the system than what users infer from the system image. However, interactive systems can be very complex. Therefore, he or she will almost certainly not have perfect knowledge of the system and thus, the design model cannot be considered as complete and accurate.

(c) As a User Interface Design expert, you have been asked to design the user interface for a new mobile application which monitors and records in real time, exercise activities such as walking, running and cycling. Describe two (2) principles you would follow in determining the placement of the controls for the user interface of the activity app to help avoid user error.

[4 Marks]

ANSWER IN THIS BOX

Sequentially used controls should be placed together so they can be used successively.

For visibility, controls should be grouped together if they have a common function.

(d) How does Task Analysis help with the design of user interfaces?

[8 Marks]

ANSWER IN THIS BOX

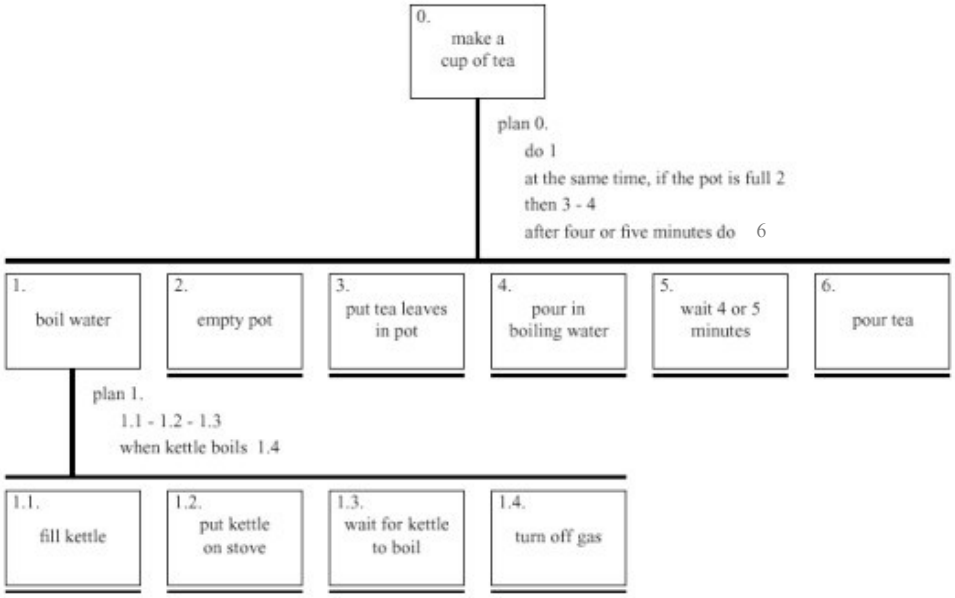
Task analysis refers to a range of techniques that can be used to assess the demands that particular activities place upon the user of an interactive system. There are three methods of task analysis such as Hierarchical Task Analysis (HTA), Cognitive Task Analysis, and Structural knowledge-based Analysis.

HTA analysis breaks a complex activity into its simpler component steps. Cognitive task analysis can establish the ways in which users can reach particular key goals. Structural knowledge-based analysis helps in problem-solving when someone encounters a new problem. Helps to know what types of things can be accomplished in a domain.

(e) Draw a Hierarchical Task Analysis (HTA) diagram for the simple task of making a cup of tea.

[13 Marks]

ANSWER IN THIS BOX



(f) Consider the vertical scroll bar of a web browser or a word processor. For each of four (4) principles given below, explain how the scrollbar uses the principle for effective design.

[12 Marks]

ANSWER IN THIS BOX

Note: There was a printing mistake for this particular part of the question because the four principles were not printed. This will be taken into consideration when marking. However, the answer would be for the correct question is given below.

1. **Affordance:**

   The thumb affords dragging; the arrow buttons afford clicking; the scrollbar track affords clicking.

2. **Constraints:**

   The thumb is graphically constrained within the scrollbar track, so dragging motion is confined to vertical motion; the thumb can't move past the start or end of the track.

3. **Visibility:**

   The position of the thumb in the track indicates the scroll position; the thumb's size (relative to the track) indicates the amount of the document in view; the presence or absence of the scrollbar indicates whether scrolling is possible.

4. **Feedback:**

   When the thumb is dragged, the document scrolls immediately; when an arrow button is clicked, it shows depressed feedback; when the scrollbar track is clicked, it flashes.

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