MAKERERE UNIVERSITY

SCHOOL OF COMPUTING & INFORMATICS TECHNOLOGY

END OF SEMESTER I EXAM, 2016/2017

PROGRAMMES: Bachelor of Science - Computer Science, Bachelor of Information Technology, Bachelor of Science – Software Engineering
YEAR OF STUDY: III

COURSE NAME: USER INTERFACE DESIGN

COURSE CODE: CSC 3119

DATE: 3rd February 2017 Time: 12 – 3 PM

INSTRUCTIONS

1. ATTEMPT ALL QUESTIONS IN SECTION A (40 MARKS)

II. ATTEMPT ANY THREE QUESTIONS IN SECTION (60 MARKS)

III. DO NOT OPEN THIS EXAM UNTIL YOU ARE TOLD TO DO SO

Section A (40 Marks)

I) List any 2 benefits and 2 disadvantages of interface Metaphors **[4 Marks]**

Benefits

- Metaphors enable the individual to learn the systems and products easily.
- They help users understand the underlying conceptual model
- Metaphors can be very innovative and enable the realm of computers and their applications to be made more accessible to a greater diversity of users

Disadvantages

- Metaphors break conventional and cultural rules e.g. recycle bin placed on desktop
- Metaphors can constrain designers in the way they conceptualize a problem space
- They conflict with design principles
- They force users to only understand the system in terms of the metaphor
- Designers can inadvertently use bad existing designs and transfer the bad parts over
- They limit designers' imagination in coming up with new conceptual models

II) Briefly describe the concept of Distributed Cognition as used in Interaction Design

[2 Marks]

The **distributed cognition concept** describes what happens in a cognitive system. Typically, this involves explaining the interactions among people, the artifacts they use, and the environment they are working in. **The** primary objective of the distributed cognition concept is to describe these interactions in terms of how information is propagated through different media i.e. how information is represented and re-represented as it moves across individuals and through the array of artifacts that are used (e.g., maps, instrument readings, scribbles, spoken word) during activities.

III) Differentiate between effectiveness, efficiency, and satisfaction by giving examples of each from your experiences with software interfaces **[3 Marks]**

Effectiveness is the completeness and accuracy with which users achieve specified goals. It considers how well the work is done.

Efficiency can be described as the speed (with accuracy) in which users can complete the tasks for which they use the product**.**

Satisfaction deals with the comfort and acceptability of use while interacting with a system or product.

1 mark for each definition and a correct example. 1/2 for definition without example

IV) List any 2 limitations of using human processor models in building Interactive systems

[2 marks]

- They are based on mental activities that happen exclusively inside the head. However, most cognitive activities involve people interacting with external kinds of representations, like books, documents, and computers among others.
- They do not adequately account for how people interact with computers and other devices in real world.

V) Write short notes on any two Evaluation Techniques used in Interaction Design **[4 Marks]**

Heuristic evaluation is an informal usability inspection technique in which experts, guided by a set of usability principles known as ***heuristics***, evaluate whether user-interface elements, such as dialog boxes, menus, navigation structure, online help, etc., conform to the principles. These heuristics closely resemble the high-level design principles and guidelines e.g., making designs consistent, reducing memory load, and using terms that users understand. When used in evaluation, they are called heuristics.

Walkthroughs are an alternative approach to heuristic evaluation for predicting users' problems without doing user testing. As the name suggests, they involve walking through a task with the system and noting problematic usability features. Most walkthrough techniques do not involve users. Others, such as pluralistic walkthroughs, involve a team that includes users, developers, and usability specialists.

Predictive models Provide a way of evaluating products or designs without directly involving users. They are less expensive than user testing and are limited to systems with predictable tasks - e.g., telephone answering systems, mobiles, cell and smart phones.

Others: Evaluation using analytics, Fitts' Law evaluation method.

VI) Briefly describe any two benefits of involving users in the process of Interactive system design **[2 Marks]**

- Enables proper management of users expectations hence no surprises and disappointments.
- Make the users active stakeholders
- makes users more likely to forgive or accept problems
- Can make a big difference to acceptance and success of product

VII) List any three categories of users in relation to Interaction Design **[3 Marks]**

- **Primary** users are those likely to be frequent hands-on users of the system
- **Secondary** users are occasional users or those who use the system through an intermediary
- **Tertiary** users are those affected by the introduction of the system or who will influence its purchase.

VIII) When building interactive products, it is important to understand users and their cognitive processes. List any 3-design implications for an Interactive System that satisfies the "Attention" cognitive process **[3 Marks]**

- Making information salient when it needs attending to
- Using techniques that make things stand out like colour, ordering, spacing, underlining, sequencing and animation
- Avoid cluttering the interface with too much information
- Search engines and form fill-ins that have simple and clean interfaces are easier to use

IX) Differentiate between user needs and requirements as used in User Interface design **[2 Marks]**

User needs are possible requirements, including user wants and experiences (Not convincing) while user requirements are statements about an intended product that specify what the user expects the product/system to be able to do.

X) How would you accomplish the task of choosing design alternatives in the development of an Interactive product? List any three ways **[3 Marks]**

- Evaluation with users or with peers, e.g. prototypes
- Looking into technical feasibility: some not possible
- Quality thresholds: Usability goals lead to usability criteria set early on and check regularly

XI) Differentiate between functional and Non-Functional requirements **[2 Marks]**

Functional requirements state what the system should do, and non-functional requirements state what constraints there are on the system and its development.

XII) Briefly describe the following terms as used in Interaction Design

(i) Scenarios **[2 Marks]**

A scenario is an informal narrative description which describes human activities or tasks in a story that allows exploration and discussion of contexts, needs, and requirements. It does not explicitly describe the use of software or other technological support to achieve a task. Using the vocabulary and phrasing of users means that the scenarios can be understood by the stakeholders, and they are able to participate fully in the development process.

(ii) Use cases **[2 Marks]**

Use cases focuses on user goals, but the emphasis here is on a user-system interaction rather than the user's task itself. Although their focus is specifically on the interaction between the user (called an "actor") and a software system, the stress is still very much on the user's perspective, not the system'

(iii) Essential use cases **[2 Marks]**

Essential use cases describe the interaction between the user and the system at a high level of abstraction. The goal of an essential use case is to convey the most important aspects of the user-system interaction by focusing on the user's intent and on the observable result of the system (without specifying the internal steps the system takes to achieve the result).

XIII) Differentiate between low fidelity prototyping and high fidelity prototyping **[2 marks]**

Low-fidelity prototyping is where the product produced does not look very much like the final product. For example, it uses materials that are very different from the intended final version, such as paper and cardboard rather than electronic screens and metal **While High-fidelity prototyping** uses materials that you would expect to be in the final product and produces a prototype that looks much more like the final thing.

XIV) Participatory design is one of the ways one can gather User interface requirements; state any two disadvantages of Participatory Design. **[2 Marks]**

- Cultural differences can become acute when users and designers are asked to work together to produce a specification for a system
- It potentially more costly / time consuming
- lengthier design / implementation period
- Antagonism from those whose suggestions are not incorporated
- users may be able to come up with problems but not solutions