The University of Melbourne
Semester 1 Assessment 2013

Department of Computing and Information Systems

INF030004
Usability Engineering

Student Number: 521247

Exam Duration	2 hours
Reading Time	15 minutes
This paper has	4 pages (including this one)
Identical Exam Papers	None
Common Content	None

Authorised Materials:

No materials are authorised.

Instructions to Invigilators:

(a) Students should receive this examination paper, a multiple choice answer sheet (section A) and an answer booklet (section B)

(b) Reference materials (e.g. texts, dictionaries) and electronic devices are not permitted.

(c) The examination paper is to remain in the examination room.

Instructions to Students:

Candidates must return this examination paper and the answer sheet at the end of the exam.

The total mark for this exam is 100 marks, representing 50% of the final assessment.

This paper has two sections:

- Section A contains 10 multiple-choice questions, worth a total of 20 marks.
- Section B contains 4 extended-answer questions, worth a total of 80 marks.

In **Section A** students should choose the *best* answer for each question. Answers are marked on the separate answer sheet provided. In **Section B** answers are written in the answer booklet.

Candidates should answer ALL questions. There is no penalty for incorrect answers.

Section A: Multiple Choice Questions

This Section contains 10 multiple-choice questions. Each question is worth 2 marks.
It is recommended you spend approximately 25 minutes on this section.
Choose the single best answer to each question.
Write your answer on the answer sheet provided.

Questions 1 to 4 refer to Norman's Natural Design and Seven Stages Model of Interaction

REAL EXAM!!

1 In Norman's concepts, a 'constraint' is best defined as:

a. a clash of concerns between different stakeholder groups
b. a business requirement that must be followed in interface design
c. a persistent usability problem
d. a property of a device that limits the user's actions
e. a limit in screen real estate

2 In Norman's concepts, 'visibility' is best defined as:

a. a user being able to see what their goals are
b. letting the user know when they have taken a correct action
c. a user being able to perceive the relevant aspects of a device
d. good use of the limited screen real estate
e. being clear to the user what action must be taken next

3 Consider a control dial on a fridge to adjust temperature. Imagine that the dial can be moved either towards a label 'HIGH' or 'LOW'. Many users will assume that these labels refer to high and low temperature. Others will assume that they mean a high or low cooling effect. What is the best way to describe this usability problem?

a. a constraint problem
b. a mapping problem
c. an affordance problem
d. a feedback problem
e. a visibility problem

4 In another fridge, the labels 'COLDER' and 'WARMER' are used with a slider control. Users find these labels clear, but many of them do not realise that the slider can be moved to alter the temperature setting. What is the best way to describe this usability problem?

a. a constraint problem
b. a mapping problem
c. an affordance problem
d. a feedback problem
e. a visibility problem

6 One example of a *theory-based* approach to usability evaluation is:

a. Rich Picture
b. Stakeholder Profiles
c. Cognitive Walkthrough
d. Heuristic Evaluation
e. Goal-Operator-Methods-Selection Rules (GOMS)

7 A graphical user interface for file management is often described as using the principle of *'direct manipulation'*. This means that:

a. the interface has been designed to work in a particular 'situation of use'
b. the user feels as if they act on files and folders without the mediation of an operating system
c. the interface provides a strong conceptual model
d. the interface avoids the problem of multiple modes
e. the interface works well for novices and experts alike

8 Which is the following would not be considered a principle of Contextual Inquiry

a. investigations are conducted in the workplace
b. investigators must act as apprentices
c. investigators must learn by watching, listening and asking questions
d. investigators must master the craft of the workplace in order to understand it fully
e. investigators must develop a close relationship workers that stimulates an inquisitiveness about the details of the work

9 If a prototype is described as *horizontal*, it implies that:

a. it is paper-based and therefore low in cost
b. it includes many functions, but they are not operational
c. it is based on constructing only 'screen inserts' that lie on the real device
d. it includes at least one function that has been implemented fully
e. it is built at the very beginning of an iterative design process

10 Within usability professionals who work in wider systems development projects, it is commonly believed that usability considerations should be carried out:

a. as early as possible in the development cycle
b. in the middle of a development cycle when initial design is carried out
c. towards the end of the cycle when there is a working version to evaluate
d. both b and c
e. all of a, b and c

Section B: Extended-Answer Questions

This section contains 4 extended answer questions. Each question is worth 20 marks.
It is recommended you spend approximately 25 minutes on each question.
Write your answer in the answer booklet provided.

Question 1 - Overview (one of the following questions will be on the exam)

- Compare and contrast definitions of *usability* offered by ISO and that offered by Rogers et al. Discuss the five crucial features of *user-centred-design* (as presented in lectures) and explain how these can be used to achieve usability goals.
- Compare and contrast three different techniques to elicit user needs. Discuss the core principles of *contextual inquiry* (as defined by Beyer & Holtzblatt) and explain how it is different to traditional approaches for gathering user requirements.
- Explain the *task-artefact cycle* (as defined by J.Carroll), and illustrate the core principles with two examples. Describe *scenario-based design* and explain how it helps to address problems arising from the task-artefact cycle.

Question 2 - Concepts and Theories (one of the following questions will be on the exam)

- Explain each stage of Norman's seven-stage model of interaction, and use one example to illustrate these stages. Using the seven-stage model, define the *gulf-of-evaluation* and the *gulf-of-execution*? Suggest two ways that a user interface designer can minimise each gulf.
- Define and distinguish between the concepts of *affordance*, *visibility* and *constraint*. Illustrate your answer with examples of each. According to the paper by Kaptelinin and Nardi (as presented in lectures), in what ways are the HCI notions of affordances different to those originally proposed by the psychologist Gibson?
- Discuss the three properties of *direct manipulation* (as originally proposed by Shneiderman and listed in the paper by Hutchins, Hollan and Norman 1985). Give one example of a system that embodies all three characteristics of direct manipulation and another example of a system that embodies none (provide an justification for each example).

Question 3 - Design & Evaluation (one of the following questions will be on the exam)

- Explain how Gestalt principles of *proximity* and *similarity* can be used to reduce cognitive load when applied to designing interfaces. Give an example of each. Discuss how Roger's notion of *external cognition* can be used to reduce cognitive load (give example).
- Outline a usability *testing and evaluation plan* for a low-fidelity prototype. The prototype you are evaluating is to be used by parking officers to issue parking tickets to cars parked illegally on roads. The evaluation plan must address each of the eight headings identified in the lectures. → Revise evaluation lectures
- Compare and contrast usability evaluation methods that adopt *user-involvement* with those that adopt *non-user-involvement*. Discuss the benefits and disadvantages of each. Give an example of when it would be appropriate to adopt each approach (and explain why). → show understanding (examples)

Question 4 - Devices & Issues (one of the following questions will be on the exam)

- Choose three *pointing input devices* and discuss their characteristics according to relative/absolute mappings and their direct/indirect mappings. Choose three other input devices that are not primarily used for pointing and selecting. Describe their core features (from a user perspective) and differentiate each device by identifying an appropriate task, user and context.
- Discuss *social computing* and how it is different to traditional computing. In lectures we argued that social computing was valuable for three reasons. Discuss these three benefits of social computing and give examples of how each are achieved.
- Discuss the changes in the way *task*, *user* and *context* have been characterised over the previous five decades. Select a new (or emerging) technology and discuss the way task, user and context are currently understood for the use of this technology.

assist com / analyse com / unload unit / soc. to do work?

Need to clearly define, first.

Use same words in both definition + example

----- END of EXAM PAPER -----