



BSc EXAMINATION

COMPUTER SCIENCE

Interaction Design

Release date: Thursday 9 September 2021 at 12:00 midday British Summer Time

Submission date: Friday 10 September 2021 by 12:00 midday British Summer Time

Time allowed: 24 hours to submit

INSTRUCTIONS TO CANDIDATES:

Section A of this assessment paper consists of a set of **10** Multiple Choice Questions (MCQs) which you will take separately from this paper. You should attempt to answer **ALL** the questions in Section A. The maximum mark for Section A is **40**.

Section A will be completed online on the VLE. You may choose to access the MCQs at any time following the release of the paper, but once you have accessed the MCQs you must submit your answers before the deadline or within **4 hours** of starting whichever occurs first.

Section B of this assessment paper is an online assessment to be completed within the same 24-hour window as Section A. We anticipate that approximately **1 hour** is sufficient for you to answer Section B. Candidates must answer **TWO** out of the **THREE** questions in Section B. The maximum mark for Section B is **60**.

Calculators are not permitted in this examination. Credit will only be given if all workings are shown.

You should complete **Section B** of this paper and submit your answers as **one document**, if possible, in Microsoft Word or a PDF to the appropriate area on the VLE. You are permitted to upload 30 documents. However, we advise you to upload as few documents as possible. Each file uploaded must be accompanied by a coversheet containing your **candidate number**. In addition, your answers must have your candidate number written clearly at the top of the page before you upload your work. Do not write your name anywhere in your answers.

SECTION B

Candidates should answer any **TWO** questions from Section B.

Question 1

- (a) What is meant by usability and user experience? How do they differ? [4]
- (b) You are evaluating an application that allows users to edit and print photographs. Explain the following terms and suggest a way of assessing them as they relate to the photo application:
 - i. efficiency [3]
 - ii. memorability [3]
 - iii. satisfaction [3]
- (c) Describe three advantages of using an online rather than a paper-based questionnaire. [3]
- (d) Assume that we distribute a series of questions to an online discussion forum. What problems might arise in terms of sampling when using such an online questionnaire? Describe two of these problems. [2]
- (e) Provide an example of a goal, scenario and story in the context of eating at a restaurant. [3]
- (f) Describe the problems associated with goal, scenario and story oriented requirements specifications. [3]
- (g) Why is it important to test your design early in the software development cycle? [2]
- (h) You are designing an online educational game for children aged 10 to help them learn maths. What methods would you undertake for gathering user requirements and why? [4]

Question 2

- (a) Predictive evaluation models such as GOMS allow analyses of interfaces without involving actual users.
- i. Provide an example of a goal, a set of operators and a method. [3]
 - ii. Provide two examples of limitations of GOMS. [2]
- (b) Heuristic evaluation is a method of analytical evaluation. Explain the process of heuristic evaluation. [4]
- (c) Don Norman provides six “design principles” for interface design. These are: Visibility, Feedback, Constraints, Mapping, Consistency, Affordance. For FOUR of these design principles, describe the principle and give an example of how it might be applied to a system or product. [8]
- (d) You have been hired to use your human-computer interface expertise to help in the development of the user interface for software that allows scientists to view and analyse their experimental data. You decide to take an ethnographic approach to your formative evaluation study.
- i. Describe what an ethnographic approach is in the context of user interface design. [2]
 - ii. Describe THREE advantages of using an ethnographic approach. [3]
 - iii. Describe THREE disadvantages of using an ethnographic approach. [3]
 - iv. Describe what you would do in terms of collecting and analysing data to carry out the formative evaluation study using an ethnographic approach. Restrict the scope of your answer to the data entry screen of the user interface. [5]

Question 3

- (a) What is an interface metaphor? [1]
- (b) Provide examples of two interface metaphors. [2]
- (c) Why are interface metaphors useful? [2]
- (d) Novice users generally find icons easier to use than a command line interface. Explain why this might be. [2]
- (e) Expert users may prefer to use a command line interface for a task or series of tasks. Explain why this might be. [2]
- (f) Although humans often rely on spoken natural language to communicate with each other, spoken language has only recently become a more common form of human-computer interface. Give two limitations of spoken language interfaces based on the currently available technology. [4]
- (g) Describe two examples of cases where conversational interfaces may be preferable modalities of interaction to interacting with a graphical user interface. [2]
- (h) Describe the similarities and differences between A/B testing and controlled experiments. [4]
- (i) Provide three indications that might suggest a user is struggling during a think-aloud study. [6]
- (j) The LATCH framework describes five approaches for information architecture. Consider the design of a shopping experience in relation to the LATCH framework. Provide examples for each letter of LATCH on how you might structure items in a store according to these principles. [5]

END OF PAPER