UNIVERSITY OF LONDON
IMPERIAL COLLEGE OF SCIENCE, TECHNOLOGY AND MEDICINE

EXAMINATIONS 2002

BEng Honours Degree in Computing Part II
MEng Honours Degrees in Computing Part II
BSc Honours Degree in Mathematics and Computer Science Part II
MSci Honours Degree in Mathematics and Computer Science Part II
for Internal Students of the Imperial College of Science, Technology and Medicine

This paper is also taken for the relevant examinations for the Associateship of the City and Guilds of London Institute
This paper is also taken for the relevant examinations for the Associateship of the Royal College of Science

PAPER C222=MC222

SOFTWARE ENGINEERING - DESIGN II

Friday 10 May 2002, 16:00
Duration: 90 minutes
(Reading time 5 minutes)

Answer THREE questions

Paper contains 4 questions
Calculators required

1a HTTP 1.1 introduced persistent connections. Explain what this term means and why the feature was considered desirable.

b Two HTML methods are GET and the HEAD. Explain what each does and give an example of when each might be used.

c HTML forms have a range of elements, designed for different uses:

i) Name an open input element and give an example of its use.

ii) Name a closed input element for restricting choice to a single item in a list and give an example of its use.

iii) Name a closed input element for allowing choice of multiple items in a list and give an example of its use.

d A developing country is suffering from high inflation. It is suggested that a web site listing local shops and their current prices for staple goods would be useful for consumers to find the best deals available.

i) Briefly describe what server-side processing would be required.

ii) Briefly describe what web pages would be required.

iii) Do you think such a service is practical? Justify your conclusions.

The four parts carry, respectively, 20%, 20%, 30%, 30% of the marks.

2a i) Explain why state information might need to be maintained across transactions between a web browser and a web server.

ii) Suggest when it might it be most appropriate to use a hidden field in an HTML form for this.

iii) Suggest when it might it be most appropriate to use a cookie for this.

b Briefly discuss the major usability issues for web browsing, distinguishing any which are intrinsic to the web, from those which are new variants of traditional Human Computer Interaction issues. How do traditional HCI heuristics and methods address these web issues?

c Briefly explain the purpose of following:

i) style sheets

ii) client side scripting

In which way does each potentially contribute to easing the usability issues?

The three parts carry, respectively, 25%, 50%, 25% of the marks.

3a Briefly describe:

i) the process and focus of user-centred systems design,

ii) how user centred design contributes to usability,

iii) the benefits claimed, and the chief difficulties and problems.

b Briefly explain what is meant by *direct manipulation* as an interaction style, and How is it related to user centred design? Briefly summarise the main advantages, and disadvantages of this style.

c Briefly summarise the main components of a Graphical User Interface toolkit, indicating how it supports the direct manipulation style. Why are such toolkits typically object oriented?

d Briefly describe the distinct components of GUI code to produce an arrangement of buttons uniformly laid on a touch screen display intended for choosing one of several types of ticket.

The four parts, a), b, c), and d) each carry 25% of the total marks.

4a State the main methods for evaluating an interactive computer system. For each of the following scenarios, briefly explain the sorts of evaluation that are possible, indicate the most practical, and the principle feature of such an evaluation.

i) A large software company wants to identify problems and successes with their popular word processing package in order to inform the design of an improved version.

ii) A designer needs an immediate assessment of a prototype car navigation system.

iii) A hardware designer needs to know whether military users will be better with a touch screen or a roller ball to select points on a radar display.

b In a study of airplane pilots, the mean times on each of two tasks, one simple, the other slightly more complex, are recorded below. The study also compares use of a direct manipulation touch screen (TS), with more traditional keypad entry (KE), both immediately after switching off the autopilot (IA), and after an extended period of manual flight (EM).

Input method	Flight stage	Time in seconds for: simple task	complex task
TS	IA	1.9	2.6
KE	IA	1.6	2.9
TS	EM	1.1	2.0
KE	EM	1.4	2.5

Showing your working table, calculate the main effects and interactions, then briefly explain what your recommendations from this study would be.

Parts a and b carry, respectively, 40%, and 60% of the marks.