PRIFYSGOL CYMRU; UNIVERSITY OF WALES

M.Sc. AND DIPLOMA EXAMINATIONS

May/June 2002

SWANSEA

Computer Science

CS M54   Professional Software Development

Attempt 2 questions out of 3

Time allowed: 2 hours

Students are permitted to use the dictionaries provided by the University

Students are NOT permitted to use calculators

Question 1

(a) Contrast and compare the waterfall model (or 'classical' model) of software development and the iterative approach.

[12 marks]

(b) What is the Capability Maturity Model and what purpose does it serve?

[6 marks]

(c) An insurance company that specialises in health insurance wishes to implement an electronic document management system. The basic idea is that all documents that are received by the company are scanned in and linked to the relevant record, together with any electronic documents which have been produced, so that all documentation held on a particular customer/policy/claim are available, linked together in electronic format. What development approach would you recommend for this software project? Give reasons for your answer.

[7 marks]

Question 2

(a)(i) In the context of project management, explain the following terms: task, milestone, critical path, and slack.

[6 marks]

(ii) Gantt charts and network charts can be used to display aspects of a project plan. Briefly describe the use of these tools and indicate what particular aspects they are best suited for.

[6 marks]

(b) Explain using an example the following types of testing: unit testing, white box testing, black box testing and stress testing.

[8 marks]

(c) How can project scheduling affect integration testing?

[5 marks]

Question 3

(a)   Describe the main provisions of the Data Protection Act 1998. Include in your answer an explanation of the purpose of the Act, the areas it covers, the Data Protection Principles, the rights of individuals, and the function of the Information Commissioner.

[9 marks]

(b)   Briefly describe the main provisions of the Freedom of Information Act 2000 and Human Rights Act 1998. In what way do these two pieces of legislation affect the provisions of the Data Protection Act 1998.

[4 marks]

(c)   Why should a professional software engineer be aware of the main provisions of the legislation mentioned in parts (a) and (b)? Give 2 examples of features a programmer could build into a software system to aid compliance with the Data Protection Act 1998.

[5 marks]

(d)   A lecturer in the Computer Science department of a university is concerned about how much students may be copying one another's coursework. He asks the Computer Systems Manager to provide him with as much information as is available from the system, including login/logout times, access to their file stores, access to their email, and internet usage logs. Discuss the legal and ethical issues that arise in this example. How would your answer differ, if at all, if the example were of a manager wanting access to employees' data?

[7 marks]