

The University of Nottingham

SCHOOL OF COMPUTER SCIENCE

A LEVEL 3 MODULE, AUTUMN SEMESTER 2014-2015

COMPUTERS IN THE WORLD (Module G53CWO)

Time allowed ONE HOUR

Candidates may complete the front cover of their answer book and sign their desk card but must NOT write anything else until the start of the examination period is announced

Answer ONE Question From Section A and ONE Question From Section B

No calculators are permitted in this examination.

Dictionaries are not allowed with one exception. Those whose first language is not English may use a standard translation dictionary to translate between that language and English provided that neither language is the subject of this examination. Subject specific translation dictionaries are not permitted.

No electronic devices capable of storing and retrieving text, including electronic dictionaries, may be used.

DO NOT turn your examination paper over until instructed to do so

ADDITIONAL MATERIAL:

None

INFORMATION FOR INVIGILATORS:

Please collect the examination papers together with the answer books.

SECTION A
Answer ONE Question From This Section

1. This question explores the topics: *Morality, Ethics and Professionalism*.
 - i. Explain the difference between the following three concepts: 'morality', 'ethics', and 'ethics theory'. **[5 marks]**
 - ii. Explain 'ethical relativism' and discuss its relation to 'professional ethics'. **[5 marks]**
 - iii. Provide a reasoning for the importance of professional ethics in computing with reference to how computers affect society. **[10 marks]**
 - iv. Two factors that have influenced the study of professional ethics in the computing context are the 'pervasive nature of computers' and 'people's reliance/trust on computers'. Considering these two factors, discuss the importance of including professional ethics as part of the formal instruction in a computing degree. **[15 marks]**
 - v. According to the BCS (British Computer Society) model of professionalism, list and explain briefly the five defining features of a 'professional'. Then, explain briefly the nature and purpose of a 'code of professional conduct'. **[15 marks]**

2. This question explores the topics: *Intellectual/Intangible Property and Critical Thinking*.
 - i. Explain briefly the 'theory of right of property' proposed by John Locke. Then explain how this theory relates to the protection of creativity and invention. **[5 marks]**
 - ii. Explain the 'doctrine of fair use' in the context of intellectual/intangible property protection and illustrate with an example. **[5 marks]**
 - iii. Explain briefly the concepts of 'trade secrets' and 'patents' and their applicability to the intellectual property protection of software. Then, using real examples, discuss the controversy of using patents for software and algorithms. **[10 marks]**
 - iv. Provide a brief argument (~100 words) about an ethical situation that students might confront during their education. Then using that argument, explain the characteristics of a sound argument in critical thinking. **[15 marks]**
 - v. Explain four types of errors in reasoning within critical thinking. Then, provide an example of an argument to illustrate one of the errors in reasoning that you explained. **[15 marks]**

SECTION B

Answer ONE Question From This Section

The 2 questions in this Section refer to the following scenario:

Imagine you are the Project Manager appointed by Company A to commission an online banking system for Bank B. Your team completes the design, implementation and testing by the end of the contracted six months' period. In an external audit arranged by Company A, the certified Software Quality Assurance (QA) Auditor, named C, who is a good friend of yours, finds that the system can only pass the current standards, but would need to be enhanced to meet the new QA standards coming into effect in a month's time. The CEO of A would like to deliver the system as it is, as incorporating the required enhancement would cause project delay, hence cost penalty.

3. In this question you are asked to discuss *privacy and reliability/dependability* in the given scenario.
 - i. Using the scenario given above, discuss and illustrate three privacy and data protection issues that merit ethical consideration. In the discussion of each of these three issues, make reference to principles about privacy that you think are applicable. **[15 marks]**
 - ii. Explain the concepts of reliability and dependability using the scenario above to illustrate your answer. Provide a reasoning to discuss the two attributes of dependable software that you think are the most critical in the above scenario. **[15 marks]**
 - iii. Using the scenario given above to illustrate your answer, list and discuss at least five of the issues that software developers should consider in the context of ethics for the development of dependable software. **[20 marks]**

4. In this question you are asked to discuss *professional ethical issues* in the given scenario.
 - i. Considering the stakeholders in the scenario given above, explain how professional ethics differ from practical ethics (applied ethics). **[15 marks]**
 - ii. Discuss the ethics issues and possible consequences if each of the following actions is taken: **[25 marks]**
 - a) Collaborate with your CEO and persuade your good friend C to exclude the new QA standards in the audit report.
 - b) Go against your CEO's instruction and inform Bank B about the new requirements.
 - c) Keep quiet and let your friend C and your CEO decide.
 - iii. Even though a Professional Code like 'ACM/IEEE Software Code of Ethics and Professional Practice' is not law, it nevertheless may have some enforcement power, e.g. Bank B could bring the QA Auditor, C, to court if there is any suspicion of his wrong doing. Explain why this is the case referring to some of the 8 principles covered by this code. **[10 marks]**