

COMPUTER SCIENCE TRIPOS Part IA – 2019 – Paper 2

5 Software and Security Engineering (arb33)

PenAMessage is a text messaging platform written by a start-up. A potential buyer is considering hiring you to conduct an audit.

(a) The potential buyer interviews you to assess your background. For each pair of terms, discuss whether the terms are equivalent.

(i) error and failure

(ii) hazard and risk

(iii) safety and reliability

(iv) dependability and security

[8 marks]

The potential buyer decides to hire you. The CTO of the start-up explains that users register by installing the PenAMessage app on their smartphone. On registration, the app sends the phone number of the smartphone together with a list of all phone numbers found in the contact address book to a single physical server operated by PenAMessage. The server responds with a list of those contacts in the address book who are registered users. Registered users send messages to one another using the app; all such messages are sent via the server.

(b) Write down four major elements of the PenAMessage system which you will consider as part of your audit. [4 marks]

(c) Describe how the failure of each element you selected in Part (b) might affect overall system dependability, user privacy and security. State any assumptions you make about the architecture and implementation of PenAMessage. [4 marks]

(d) Describe the approach you would take to identify the most important risks to the security of PenAMessage. [4 marks]