UNIVERSITY OF LONDON

GOLDSMITHS COLLEGE

Department of Computing

Foundation Examination 2014

IS50004A
Study skills and introduction to the use of computers

Duration: 2 hours 15 minutes

Date and time:

There are five questions in this paper. You should answer no more than THREE questions. Full marks will be awarded for complete answers to a total of THREE questions. Each question carries 25 marks. The marks for each part of a question are indicated at the end of the part in [.] brackets.

There are 75 marks available on this paper.

No calculators should be used.

**THIS PAPER MUST NOT BE REMOVED
FROM THE EXAMINATION ROOM**

QUESTION 1.

a)   Explain the difference between:

       i.   A computer network and an internet
      ii.   Circuit switching and packet switching
     iii.   The Internet and the World Wide Web
     iv.   Logical and physical addressing

[10 marks]

b)   Briefly compare the client-server and peer-to-peer models.
[5 marks]

c)   In the TCP/IP model, which layer is responsible for logical addressing of host computers and routing messages? Say as much as you can about how the following sequences identify a particular subnet and host computer. How many hosts can be attached in each case? Explain your answer.

       i.   129.8.45.13/22
      ii.   220.3.6.23/26   **[10 marks]**

QUESTION 2.

a) Draw a circuit diagram for a half-adder as a combination of Boolean logic gates. Explain how the half-adder processes the inputs x=1 and y =1.
[7 marks]

b) Using your half-adder as a block diagram, draw a one-bit full adder.
[5 marks]

c) What are the two main functions of an Operating System?   **[4 marks]**

d) Briefly describe and contrast the following mechanisms of implementing input/output (I/O):

(i) Programmed I/O
(ii) Interrupt driven I/O
(iii) Direct memory access (DMA)   **[9 marks]**

QUESTION 3.

   a) List three main components of the CPU and describe their function.

                                                            [6 marks]

   b) Explain what is meant by "pipelining" in the context of instruction execution.

                                                            [6 marks]

   c) What are the typical components of machine code instructions?

                                                            [4 marks]

   d) What is meant by the terms Reduced Instruction Set Computer (RISC) and Complex Instruction Set Computer (CISC)? Give an example of how a reduced instruction set could be used to implement arithmetical operations.

                                                            [9 marks]

QUESTION 4.

a) Why is it important for website operators to ensure that their content can be accessed by people with disabilities? **[5 marks]**

b)
   i. Explain in general terms how a **screen reader** renders a webpage. How will this influence the design and coding of a webpage that is likely to be accessed by partially sighted users?

   ii. Appendix A shows an example of a web page coded in HTML. Explain any accessibility problems with the HTML.

[10 marks]

c) Suppose you are operating a social networking website that allows end users to upload text, graphics, audio and video files, and requires users to provide personal details such as their full   name and date of birth. List three ways such a website could be liable to litigation or criminal prosecution, and explain what steps you would take to safeguard against this. Note that you should not duplicate any material from other answers to this exam.

[10 marks]

QUESTION 5.

a) Explain in one or two sentences what is meant by each of the following types of attack on computer systems:

     i. Denial of service
     ii. Ransom
     iii. Phishing
     iv. Trojan horse   **[8 marks]**

b) Describe three technical or procedural measures an enterprise can take to protect data against accidental or malicious loss or damage. **[9 marks]**

c) Explain the important differences between copyright and patent as means of protecting intellectual property. Do you think it is more appropriate for computer software to be covered by copyright or patent law? Justify your answer. **[8 marks]**

Appendix A

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<tbody><tr><td align="center" valign="center" width="25%">
<h3>Stanley Fish</h3>
<p><font size="4"><b>Lecturer<b></b></b></font>
<br><font size="4"><b>Computer Science</b></font> </p><p>
</p>
</td>
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<br><font size="4"><a href="Algorithms.html">Algorithms</a></font>
</p>
<p>
<font size="5">Research</font></p>
<p><font size="4">Software Agents</font>
<br><font size="4">Computational Creativity</font>
</p>
<p><a href="Publications.html">
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END OF EXAMINATION