UNIVERSITY OF LONDON

GOLDSMITHS COLLEGE

Department of Computing

Foundation Examination 2016

IS50004A
Study skills and introduction to the use of computers

Duration: 2 hours 15 minutes

Date and time:

There are FOUR questions in this paper. You should answer Question 1 and two of Questions 2-4. You should answer no more than THREE questions. Question 1 carries 40 marks and Questions 2-4 carry 30 marks each. The marks for each part of a question are indicated at the end of the part in [.] brackets.

There are 100 marks available on this paper.

No calculators should be used.

THIS PAPER MUST NOT BE REMOVED
FROM THE EXAMINATION ROOM

QUESTION 1 [40 marks]

THIS QUESTION IS COMPULSORY.

a. Explain what is meant by the following terms in the context of data protection:

   i. Data subject

   ii. Data controller

   iii. Sensitive personal data

[6 marks]

b. Why is it important for website designers to ensure that their content can be accessed by people with disabilities? **[4 marks]**

c. Explain the concept of **layering** in networked computing, and describe the five layers of the TCP/IP stack.

[8 marks]

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

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

   i. Distributed Denial of Service
   ii. Ransom
   iii. Phishing
   iv. Trojan Horse **[8 marks]**

f. Explain the important differences between copyright and patent as means of protecting intellectual property. **[4 marks]**

g. Explain what is meant by a *register* in the context of computer architecture and describe three kinds of register. **[6 marks]**

ANSWER NO MORE THAN TWO OF THE FOLLOWING QUESTIONS.

QUESTION 2.

a. Which TCP/IP layers do the following protocols belong to? Briefly state the functions defined for each protocol, for instance *IMAP: Application layer email protocol which keeps all messages on server*.

   i. HTTP
   ii. TCP
   iii. DHCP
   iv. DNS

[8 marks]

b.

   i. Explain why the HTTP/2 protocol has been developed as a replacement for HTTP/1.x.
   ii. Describe three key differences between HTTP/2 and HTTP/1.x.

[8 marks]

c. What is the preferred character-set encoding for email and web pages? Describe some important differences between this encoding and the original ASCII character set.

[8 marks]

d. Describe two features that can make web pages more accessible to users with disabilities.

[6 marks]

QUESTION 3

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 =0.

[8 marks]

b. Using your half-adder as a block diagram, draw a one-bit full adder.

[5 marks]

c. 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]**

d. Briefly describe the standard instruction execution cycle and a technique that is commonly used to make it run more efficiently.

[8 marks]

QUESTION 4.

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

b. Do you think it is more appropriate for computer software to be covered by copyright or patent law? Justify your answer.

[5 marks]

c. Principle 8 of the Data Protection Act (DPA) forbids the transfer of personal data to countries outside the European Economic Area, unless safeguards equivalent to the provisions of the DPA are in force. Describe one scheme which was set up to enable transfers from within the EU to the USA, and discuss any problems that have arisen with the implementation of this scheme.

[10 marks]

d. Describe three of Nielsen's usability principles. Give an example of a commonly used application that appears to violate one of these principles.

[6 marks]

END OF EXAMINATION