

THE BRITISH COMPUTER SOCIETY

THE BCS PROFESSIONAL EXAMINATIONS
BCS Level 4 Certificate in IT

COMPUTER & NETWORK TECHNOLOGY

23rd April 2007, 2.30 p.m.-4.30 p.m.
Time: TWO hours

Both Section A and Section B carry 50% of the marks. You are advised to spend about 1 hour on Section A (30 minutes per question) and 1 hour on Section B (12 minutes per question).

*The marks given in brackets are **indicative** of the weight given to each part of the question.*

Calculators are NOT allowed in this examination.

SECTION A

Answer TWO questions out of FOUR. Each question carries 30 marks.

1.
 - a) In the context of data communications, what is a **protocol** and why is it required? **(5 marks)**
 - b) Briefly define the seven levels of the ISO model for open systems interconnection, and state what objective each level is intended to achieve. **(15 marks)**
 - c) Of the seven layers of the ISO model OSI, the **physical layer**, is very different to the other six layers in terms of the level of service it offers. What is this difference and how does the physical layer overcome its limitations? **(10 marks)**

2. The success of modern computers in terms of computation power, flexibility and connectivity has led to the emergence of new problems.

In particular, a range of programs, collectively called **malware**, has been created to exploit weaknesses in the security of modern computers. Typical examples of malware are viruses, SPAM, Trojan horses, and worms.

Write a report on the state of malware today.

Your answer should include a discussion of the history of malware, the reason modern computers are vulnerable to malware, the types of malware currently available, and the measures being taken to counter malware.

Your report should conclude with a comment on what is likely to happen in next few years. **(30 marks)**

3. Some people might state that “*the operating system of a personal computer is just as important as its hardware.*”

Explain why a person may make this statement and discuss, with reasons, the extent to which this statement is true. Your answer should include typical facilities that a modern operating system provides (including both resource control functions such as file handling and the user interface). **(30 marks)**

Turn over]

4. Over the past 30 years, the performance of the microprocessors used in computers has changed dramatically.

A modern microprocessor is of the order of 1,000 times faster than a microprocessor in the 1970s.

Some of the increase in performance is derived from improvements in manufacturing techniques (e.g., silicon technology). Some improvements have resulted from changes in computer architecture (e.g., instruction set) and some from changes in computer organization (i.e., how the architecture is implemented at the register and gate level).

Write a report explaining why the performance of computers has increased so much over the past 30 years.

Your answer should include a discussion of whether such a level of progress can be sustained over the next 10 years or whether progress in computer design is likely to reach natural limits. **(30 marks)**

SECTION B

Answer FIVE questions out of EIGHT. Each question carries 12 marks.

5. a) Explain the function and importance of a web browser. **(4 marks)**
b) SPAM can seriously affect internet users. Explain what SPAM is. Describe how users can protect themselves against SPAM. **(8 marks)**
6. Over the past few years, there has been lot of development in peripheral devices.
a) Describe the main features of LCD screens and contrast them with CRT screens. **(6 marks)**
b) What do you understand by **resolution** as applied to monitors and printers? **(6 marks)**
7. Carry out the following operations showing all workings:
a) Convert $9D6_{16}$ to binary **(3 marks)**
b) 11100111_2 XOR 01111111_2 **(3 marks)**
c) $BC_{16} + AB_{16}$ **(3 marks)**
d) 10101011_2 AND 11111001_2 **(3 marks)**
8. In the context of network security, differentiate between the following terms:
a) SSL and SHTTP **(6 marks)**
b) Firewall and Access Control List **(6 marks)**
9. a) Describe the following terms:
i) Domain **(3 marks)**
ii) Domain Name System (DNS) **(3 marks)**
b) In the context of networks describe and explain CSMA/CD and 100Base-T. **(6 marks)**

10. With development of the internet, many organizations also use intranets and extranets.

a) Describe an intranet.

(6 marks)

b) Compare and contrast an intranet with an extranet.

(6 marks)

11. Provide a brief description on each of the following hardware items:

a) expansion slot

(3 marks)

b) network interface card

(3 marks)

c) video adapter

(3 marks)

d) SCSI controller

(3 marks)

12. Briefly describe the following terms:

a) TCP/IP

(3 marks)

b) ISDN

(3 marks)

c) FTP

(3 marks)

d) GPRS

(3 marks)