BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 4 Certificate in IT

COMPUTER & NETWORK TECHNOLOGY

Tuesday 24th September 2013 - Morning
Time: TWO hours

Section A and Section B each 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).

Answer the Section A questions you attempt in Answer Book A
Answer the Section B questions you attempt in Answer Book B

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 2 questions (out of 4). Each question carries 30 marks.

A1 a) Describe (by means of one or more diagrams) the structure of a CPU at the level of registers, buses, and functional units.

(9 marks)

b) The stored-program digital computer (also called the von Neumann machine) is said to operate in a ***two phase, fetch-execute cycle***.

Explain what we mean by the fetch-execute cycle and explain all the steps in the execution of an instruction using the diagram you provided in part a) of this question.

(9 marks)

c) Translate the expression

IF X = 4 THEN X = X + P × Q + 3

into a low-level language form using any low-level language you wish. Define the action of any instruction you use.

(6 marks)

d) Generally, computers (microprocessors) are said to fall into two categories: RISC and CISC. Briefly, explain the meaning of RISC and CISC and the differences between them.

(6 marks)

Turn Over]

A2 A computer can perform input output operations by means of programmed I/O, DMA, or interrupt-driven I/O.

Explain how these three modes of I/O operate and the difference between them in terms of their complexity and performance.

(30 marks)

A3 a) Computers come under threat from a variety of sources. The software that can be used to harm or adversely affect the performance of a computer, or to perform undesirable actions (e.g., identity theft) is called ***malware***.

Describe the principal types of malware in existence today. Include the level of threat and the danger each form of malware presents.

(15 marks)

b) How can the user of a computer reduce the threat of malware?

(10 marks)

c) What role does an organisation like *BCS The Chartered Institute for IT* have in the prevention of malware?

(5 marks)

A4 One of the great steps forward in the world of computer communications was the development of the ***Open Systems Interconnection***, OSI, model for communications systems.

a) What is the OSI model and why is it so important? Your answer should include a description of the OSI model and a description of each of the seven layers.

(22 marks)

b) Briefly describe the TCP/IP protocol and explain how it fits in the OSI model.

(8 marks)

SECTION B

Answer 5 questions (out of 8). Each question carries 12 marks.

B5 Describe and differentiate between the following types of memory giving typical uses of each:

a) SRAM **(6 marks)**
b) DRAM **(6 marks)**

B6 Describe the following computer network related terms:

a) Server **(4 marks)**
b) Router **(4 marks)**
c) Switch **(4 marks)**

B7 The technical specification of a printer is as follows. Briefly explain each of the items in the specification:

a) Laser printer **(2 marks)**
b) 32 Mb Memory available on printer **(2 marks)**
c) Print resolution of up to 2400 X 600 dpi effective output **(2 marks)**
d) Speed of up to 18 ppm **(2 marks)**
e) Eco print **(2 marks)**
f) Computer interface USB 2.0, WiFi **(2 marks)**

B8 Describe the following Operating Systems related terms:

a) Kernel **(4 marks)**
b) Multitasking **(4 marks)**
c) Scheduler **(4 marks)**

B9 a) Describe what is meant by cloud computing **(6 marks)**
b) Explain the services offered by cloud computing **(6 marks)**

B10 In the context of networking:

a) Differentiate between intranet and extranet **(8 marks)**
b) Provide appropriate uses of each **(4 marks)**

B11 a) Compare and contrast magnetic storage with optical storage **(6 marks)**
b) Describe the various optical storage devices available **(6 marks)**

B12 a) Describe how and why data encryption is used **(8 marks)**
b) Describe the purpose of HTTPS **(4 marks)**