BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 4 Certificate in IT

COMPUTER & NETWORK TECHNOLOGY

Thursday 26th March 2015 - 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 <u>Section A</u> questions you attempt in <u>Answer Book A</u>
Answer the <u>Section B</u> questions you attempt in <u>Answer Book B</u>

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 Computer languages can be divided into three fundamental categories:

- o Assembly language (machine code)
- o High-level language (e.g., C, Java, Python)
- o Application-level language (e.g., Photoshop, PowerPoint, Solitaire, Excel)

What are the differences between each of these three categories of computer language?

Your answer should include a discussion of the broad characteristics of the languages in each of these categories. You should also state the strengths and weaknesses of these languages and discuss their applications.

(30 marks)

A2 Describe three distinct classes of malware (i.e., harmful software) that interfere with the normal correct running of a computer. Your answer should include the characteristics of the malware, what it does, how it is spread, and what level of threat it presents to the user.

Discuss what the user can do to prevent malware.

(30 marks)

A3 A modern computer's secondary storage memory may consist of a combination of hard disk drives (HDDs), solid state drives (SSDs), and Blu-ray optical drives.

a) Describe the operating principles of each of these storage devices and compare and contrast their fundamental characteristics.

(20 marks)

b) What role does the operating system play in managing secondary storage?

(10 marks)

A4 A combinational logic circuit has four inputs D, C, B, A representing the binary values 0000 to 1111 (i.e., 0 to 15 decimal). The output F is 1 if the decimal input on DCBA is divisible by 4 or by 7.

a) Draw a truth table for this system

(8 marks)

b) Obtain an expression for F from the truth table

(7 marks)

c) Obtain a simplified expression for F using either Boolean algebra or a Karnaugh map.

(8 marks)

d) Suppose that the input DCBA = 1111 could never occur and does not need to be considered. Obtain a new simplified expression for F taking this don't care condition into account.

(7 marks)

SECTION B

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

B5
a) Briefly explain the role of OSI in network design   **(4 marks)**
b) Describe Layer 7 of the OSI model.   **(8 marks)**

B6 Describe typical uses of:

a) Wi-Fi networking   **(6 marks)**
b) Broadband transmission   **(6 marks)**

B7 Discuss the similarities and differences between a laptop and a tablet computer. Your answer should include a discussion of what roles each device is best suited to.

(12 marks)

B8 Compare and contrast (in terms of operating principles, uses and running costs) the following devices:

a) Laser printer **(4 marks)**
b) Ink jet printer **(4 marks)**
c) Networked office printer **(4 marks)**

B9 In the context of computer networking describe the features and uses of the following:

a) NIC **(3 marks)**
b) LAN **(3 marks)**
c) WAN **(3 marks)**
d) MAC address **(3 marks)**

B10 As an IT Technician, explain how you would use the following:

a) Ping **(3 marks)**
b) Traceroute **(3 marks)**
c) DNS lookup **(3 marks)**
d) Port check **(3 marks)**

B11
a) Explain why a processor (CPU) is needed in a computer system **(6 marks)**
b) Briefly describe the key features of processors used in computers today **(6 marks)**

B12 Describe the services and support offered by an Internet Service Provider(ISP).
(12 marks)