BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 4 Certificate in IT

COMPUTER & NETWORK TECHNOLOGY

Tuesday 25th September 2012 - 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 TWO questions out of FOUR in Answer Book A. Each question carries 30 marks.

A1. a) Explain the basic principle of operation of magnetic storage (hard disk drives) and optical storage (CD/DVD/Blu-Ray) drives. Your answer should include the basic operational parameters and characteristics and a discussion of how each of these storage mechanisms contributes to the overall performance of a typical high-performance desktop computer.

(20 marks)

b) The demand for more and more memory in computers and faster and faster memory seems endless. Explain why this observation is so (provide your own evidence). Your answer should include a discussion of recent trends in memory systems.

(10 marks)

A2. a) With the aid of one or more diagrams describe the structure of a digital computer at the level of buses, registers, and functional units. Explain how machine-level instructions are executed. Your answer should include a description of how a typical instruction is executed, starting with its address in the program counter.

(18 marks)

b) 100 integers are stored in consecutive locations in a computer's memory. Write an assembly language program to add them together. You may use any assembly language you wish. However, you must explain how your program works and what each instruction does.

(12 marks)

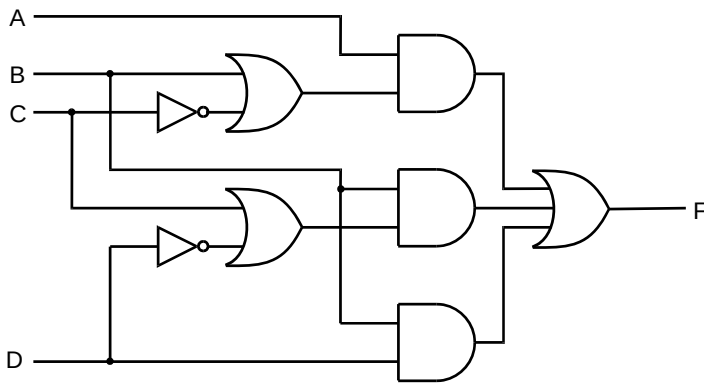
A3. a) You have a digital camera with a WiFi connection to your PC. You are on holiday in a hotel in Italy and you wish to transmit your photos to your family in Australia. Explain how modern technology is able to achieve this operation. This question requires you to give an overview of the hardware, software, and network involved in sending the images.

(20 marks)

b) Data links are not perfect and errors can occur during transmission. Explain how the messages are sent across imperfect networks and received correctly.

(10 marks)

A4. a) Draw a truth table to give the value of F in terms of inputs A, B, C, and D for the following circuit. You must include columns for all intermediate values (i.e., the outputs of all the other gates). Please order the inputs in your truth table A, B, C, and D.



(16 marks)

b) Derive a simplified Boolean expression for F in terms of A, B, C, and D.

(8 marks)

c) Using your simplified expression for F, design a new circuit that performs the same function.

(6 marks)

SECTION B

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

B5. Network addressing is crucial in setting up and managing a network.

a) Explain what an IP address is and its format.

(4 marks)

b) Describe what IP address conflicts are and how these can be resolved.

(4 marks)

c) Outline the role of Ipconfig/Ifconfig and similar commands.

(4 marks)

B6. a) Briefly describe the main functions of an Operating System.

(6 marks)

b) Differentiate between open source and proprietary operating systems.

(6 marks)

B7. Wi-Fi networking has become very popular among computer users.

a) Explain what a WiFi access point is and the security implications.

(6 marks)

b) Describe three typical uses of WiFI networking.

(6 marks)

B8. Explain the following terms as they relate to operating systems:

a) Graphical User Interface

(4 marks)

b) Mobile operating systems

(4 marks)

c) System Boot Process

(4 marks)

B9. a) Describe the functions of a print server.

(4 marks)

b) Briefly explain the operation of a laser printer.

(8 marks)

B10. Explain the following:

a) Worm

(4 marks)

b) Virus

(4 marks)

c) Trojan

(4 marks)

B11. Cloud computing has emerged as a new technology for users. Explain what cloud computing is. Describe the benefits and potential drawbacks of cloud computing.

(12 marks)

B12. Compare and contrast each of the following data storage devices. Briefly explain how each is used.

a) RAM

(3 marks)

b) USB drive

(3 marks)

c) Magnetic Disk

(3 marks)

d) Hard disk

(3 marks)