BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 4 Certificate in IT

COMPUTER AND NETWORK TECHNOLOGY

Tuesday 22nd April 2025 - 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 any Section A questions you attempt in Answer Book A
Answer any 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. Computers need software programs to be able to process data.

a) With the aid of a diagram, explain the organisation of a computer and the key flows of data between components, providing examples of the type of devices used for the key functions.

(15 marks)

b) With the aid of a diagram, describe what is meant by the fetch-execute cycle with regards to a computer.

(15 marks)

A2. SDN's are a new paradigm in the delivery of both local and wide area networks.

a) Using a supporting diagram, describe the key architecture components, planes of operation, and key interfaces of software defined networks.

(18 marks)

b) Explain the advantages of using a software defined network as opposed to a traditional legacy data network.

(12 marks)

A3. Operating systems need to have user input to be able to carry out instructions.

a) Explain the stages that a computer must go through when it processes user input for a keyboard or mouse, detailing the likely response time of the computer.

(15 marks)

b) For some computer users with additional physical needs, the use of a standard mouse or keyboard can be very difficult, if not impossible. Describe **three** alternative input methods which may benefit this community.

(15 marks)

A4. To handle modern day computing problems, whole integers, fractions and negative numbers must be handled effectively.

a) Explain what is meant by a floating-point number in the context of computer programming, where they are used and how they work.

(10 marks)

b) Convert the following to their binary and hexadecimal equivalents

i. 27.1875
ii. 15.25
iii. 127.001
iv. -99.75

(8 marks)

c) Consider computer systems represent floating point binary numbers using a 6-bit mantissa and 4-bit exponent, both using two's complement.

For the following floating point number computation, add them together and give the answer in the format described. Working out stages must be shown.

	Mantissa	Exponent
i	010100	0010
ii	011000	0001
iii	100010	0010

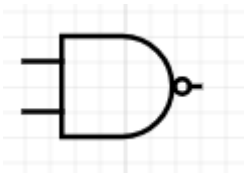
(12 marks)

[Turn Over]

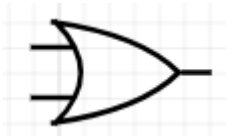
Section B
Answer 5 questions (out of 8). Each question carries 12 marks.

B5. State the type of gate being used and demonstrate the truth table for it.

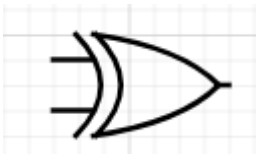
i.



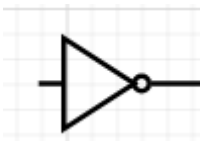
ii.



iii.



iv.



(12 marks)

B6.

a) Convert the following numbers from binary to decimal and hexadecimal.

i. 10001110
ii. 1100
iii. 1010

(6 marks)

b) Convert the following numbers from hexadecimal to decimal and binary.

i. 0F
ii. 2B
iii. A2

(6 marks)

B7.

a) Describe how you would go about achieving a fair benchmark of **two** comparable systems to determine the better performing laptop systems.

(9 marks)

b) Describe **three** factors outside of performance benchmarking that may influence the decision between comparable desktop systems.

(3 marks)

B8.

a) Describe the format of a MAC Address.

(2 marks)

b) Describe how an ARP request functions and what data is sent at each stage.

(10 marks)

B9.

a) Describe, giving examples of screen resolution and panel size, how they are measured and how in combination they impact display quality.

(6 marks)

b) Give **three** advantages and **three** disadvantages of an inkjet printer to a laser printer.

(6 marks)

B10.

a) Describe multithreading and multitasking and highlight how these can be used together.

(6 marks)

b) Explain the difference between processes and threads.

(6 marks)

B11.

a) Explain what is governed by the IEEE 802.11 standard.

(3 marks)

b) Provide **three** standards within the 802.11 standard.

(3 marks)

c) Describe what MIMO does in relation to communications, and explain how it can be used to improve communications.

(6 marks)

B12.

a) Explain the concept of a trojan horse, and how it can be combined with other malware.

(3 marks)

b) Explain how a trojan horse might be detected by an anti-virus and how a user might detect it.

(8 marks)

c) Explain the purpose of spyware.

(1 mark)

END OF EXAMINATION