

BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 4 Certificate in IT

COMPUTER AND NETWORK TECHNOLOGY

Thursday 20th April 2023 - 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 in brackets indicate 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.

Modern display systems are often LCD and, more recently, LED-based.

- a) Explain how using components such as a backlight, coloured dyes and polarising filters are combined with liquid crystals to display a coloured pixel.

(18 marks)

- b) We often measure the qualities of a display by its resolution, aspect ratio and colour depth. Explain what **each** of these three terms mean.

(12 marks)

A2.

All of the basic logic gates can be replaced by combinations of NAND gates.

- a) Describe, with the aid of truth tables, the operation of the AND, OR, NOT, and XOR standard logic gates.

(16 marks)

- b) Show as logic diagrams how **each** of AND, OR, and XOR can be represented using just NAND gates.

(14 marks)

A3.

Network designers often use DCE devices and subnetting to partition a network into smaller LAN segments within an organisation.

- a) For a private network 192.168.18.0/24, explain what this means and, using suitable example addresses, show how (using Boolean logic) a router might determine if a pair of nodes are on the same LAN or not.

(20 marks)

- b) For a node 192.168.19.45 in another part of the company, if a network administrator types "ping 192.168.18.12" on a computer, what will happen?

(Assume that 192.168.18.12 exists, is working, and will respond to ping requests, and the network administrator's PC is connected to the company network.)

Why will it happen in the way you describe?

(10 marks)

A4.

Virtual memory is now a standard feature of modern operating systems.

- a) Explain what the term virtual memory means in the context of an operating system.
(16 marks)

- b) In the context of modern operating systems and virtual memory, what is swap space used for?
(14 marks)

[Turn Over]

Section B

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

B5.

State the advantages and disadvantages of the following computer systems.

(No marks will be awarded for any comments on price, the answer should focus on functionality.)

- a) Desktop;
- b) Laptop;
- c) Tablet.

(12 marks)

B6.

Communication protocols are commonly used in computer networks:

- a) Describe the purpose of communication protocols and how they work.

(6 marks)

- b) Describe what is DHCP and how it is used.

(6 marks)

B7.

Explain **FOUR** functions of an Operating System.

(12 marks)

B8.

Explain the function of a multi-core processor with the help of a diagram.

(12 marks)

B9.

- a) Describe a LAN and a vLAN.

(6 marks)

- b) Discuss the difference between each type of network.

(6 marks)

B10.

Discuss **FOUR** factors that should be considered when purchasing either a laser printer or an inkjet printer?

(12 marks)

B11.

- a) Describe the function of a network router. You should include a diagram and you **must** also provide examples.

(6 marks)

- b) Describe the function of a network switch. You should include a diagram and you **must** also provide examples.

(6 marks)

B12.

- a) Describe what is meant by cloud computing.

(3 marks)

- b) Briefly describe **THREE** types of cloud computing.

(3 marks)

- c) Explain **THREE** advantages and **THREE** disadvantages of cloud computing.

(6 marks)

END OF EXAMINATION