BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 4 Certificate in IT

COMPUTER AND NETWORK TECHNOLOGY

Tuesday 21st April 2026 - 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.

a) What is the definition of a computer process and what are the principal events that cause processes to be created?

(6 marks)

b) With the aid of a state diagram, explain the **three** states that a process can be in and the **four** most feasible transitions possible between states?

(20 marks)

c) For the missing state transitions in part b), discuss under which circumstances either transition(s) might occur?

(4 marks)

A2.

Modern engineering computations usually use decimal units of a range of magnitudes using 10^x but in computer engineering we also use binary (Base 2) or hexadecimal (Base 16). There is a need to be able to convert figures between all these bases.

a) For unit conversion between different readings, answer the following:

i. How long is a pico-year in seconds?

ii. How many bytes are there in a 1-PB memory?

iii. The mass of the earth is 3000 yottagrams. What is that in kilograms?

(6 marks)

b) Complete the base conversions in the table below:

Binary (Base 2)	**Decimal (Base 10)**	**Hexadecimal (Base 16)**
10011001		
00010001		
11001100		
10100101		
	5	
	83	
	199	
	128	
		FC
		A7
		36
		19

(24 marks)

A3.

Network automation and software-defined networks are key innovations in modern infrastructure.

a) Explain what is meant by the term network automation when applied to today's communication infrastructure and its related requirements. What benefits does network automation bring?

(12 marks)

b) For intelligent networking devices to be able to communicate network related data, they must have both a data format and protocol/API they both understand. Discuss the most common data formats, protocols and what is meant by an API in these contexts.

(18 marks)

A4.

At the heart of the computer industry drive to increase the speed of computer CPU's is Moore's law.

a) Explain what is meant by Moore's law and discuss why its future is likely to be limited.

(10 marks)

b) How do the problems of Moore's law and the quest for true parallelism become reconciled?

(20 marks)

[Turn Over]

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

B5.

a) Explain the concept of a worm in malware and how it can be combined with other types of malware.

(4 marks)

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

(8 marks)

B6.

a) Explain what is governed by the IEEE 802.3 standard.

(3 marks)

b) Provide **three** alternative solutions to the 802.3 standard.

(3 marks)

c) Define and describe what CMSA/CD does in relation to communications and explain how it can be used to improve communications.

(6 marks)

B7.

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

(8 marks)

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

(4 marks)

B8.

a) Describe the format of an IP address and how it is commonly represented.

(2 marks)

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

(10 marks)

B9.

a) Describe contrast ratio and panel technology, using examples to explain how these technologies are measured and how, in combination, they impact display quality.

(6 marks)

b) Give **three** advantages and **three** disadvantages of an inkjet printer verses a dot matrix printer.

(6 marks)

B10.

a) Describe single-threading and multitasking and highlight how these can be used together.

(6 marks)

b) Explain the difference between processes and threads.

(6 marks)

B11.

a)

i. Define what a JK flip-flop is and its function.

(2 marks)

ii. Draw a logic circuit of a JK flip-flop.

(10 marks)

[Turn Over]

B12.

a) Given each truth table below, provide the name of the gate being shown and the symbol for it:

i.

A	B	R
0	0	1
0	1	1
1	0	1
1	1	0

ii.

A	B	R
0	0	0
0	1	1
1	0	1
1	1	1

iii.

A	B	R
0	0	0
0	1	1
1	0	1
1	1	0

iv.

A	R
0	1
1	0

(12 marks)

END OF EXAMINATION