

# **Cambridge O Level**

CANDIDATE NAME					
CENTRE NUMBER			CANDIDATE NUMBER		

**COMPUTER SCIENCE** 

2210/12

Paper 1 Computer Systems

May/June 2023

1 hour 45 minutes

You must answer on the question paper.

No additional materials are needed.

### **INSTRUCTIONS**

- Answer all questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do not write on any bar codes.
- Calculators must not be used in this paper.

# **INFORMATION**

- The total mark for this paper is 75.
- The number of marks for each question or part question is shown in brackets [].
- No marks will be awarded for using brand names of software packages or hardware.

Output devices are used to output data from a computer.

1

ac	tuotor							
	actuator		gital versa	atile disk (D'	VD)	keyboard		
nicrophone		mouse			printer	printer		
	sensor		solid-sta	te drive (SS	D)	spea	aker	[3
y numbe	rs can be c	onverted to	o hexaded	cimal.				<u>ي</u>
Convert ti	he <b>two</b> bina	ary numbei	rs to hexa	decimal.				
0010011								
)0001101								[4
Working s	space							
A value is stored as a binary number in a register.								
0	1	1	1	1	0	1	0	
A logical right shift of <b>three</b> places is performed on the binary number.								
(i) Complete the binary register to show its contents after this logical right shift.								
								[1]
ii) State	e <b>one</b> effect	this logica	al shift has	s on the hin:	arv numbei	r		ι
i, olate		. uno logico	ii oriiic riac		ary mambo	•		
ii)	State	State <b>one</b> effect	State <b>one</b> effect this logical	State <b>one</b> effect this logical shift has	State <b>one</b> effect this logical shift has on the bina	State <b>one</b> effect this logical shift has on the binary number	State <b>one</b> effect this logical shift has on the binary number.	State <b>one</b> effect this logical shift has on the binary number.

(c)	Give <b>two</b> reasons why a programmer may use hexadecimal to represent binary numbers.	
	1	
	2	
		 [2]
(d)	Denary numbers can also be converted to hexadecimal.	
	Convert the denary number to hexadecimal.	
	301	[2]
	Working space	

(b) Text that is input into a computer can be stored in a text file.  A text file can be compressed using lossless compression.  (i) State what effect this has on the file size.  [1]  (ii) Describe how lossless compression compresses the text file.		en ko	eys are pressed on a keyboard, the text is converted to binary to be processed by the er.
(ii) Clive two reasons why the text file may have been compressed.	(a)	Des	scribe how the text is converted to binary to be processed by the computer.
(ii) Clive two reasons why the text file may have been compressed.			
(ii) Clive two reasons why the text file may have been compressed.			
(ii) Cive two reasons why the text file may have been compressed.  [3]  (b) Text that is input into a computer can be stored in a text file.  A text file can be compressed using lossless compression.  (i) State what effect this has on the file size.  [1]  (iii) Describe how lossless compression compresses the text file.  [4]  (iii) Give two reasons why the text file may have been compressed.			
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A text file can be compressed using lossless compression.  (i) State what effect this has on the file size.			[3]
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(ii) Describe how lossless compression compresses the text file.  (iii) Describe how lossless compression compresses the text file.  (iii) Give two reasons why the text file may have been compressed.		A te	ext file can be compressed using lossless compression.
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(iii) Describe how lossless compression compresses the text file.  [4  (iii) Give two reasons why the text file may have been compressed.			[11]
(iii) Give <b>two</b> reasons why the text file may have been compressed.		(ii)	
(iii) Give <b>two</b> reasons why the text file may have been compressed.			
(iii) Give <b>two</b> reasons why the text file may have been compressed.			
(iii) Give <b>two</b> reasons why the text file may have been compressed.  1			
(iii) Give <b>two</b> reasons why the text file may have been compressed.  1			
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(iii) Give <b>two</b> reasons why the text file may have been compressed.  1			
1			[4]
		(iii)	Give <b>two</b> reasons why the text file may have been compressed.
2			1
2			
			2
re			[2]

**4** A student uses a mobile phone to take photographs for a school project.

The student needs to transmit the photographs to their computer. They could use serial data transmission or parallel data transmission to transmit the photographs.

(a)	(i)	Describe how the photographs would be transmitted using serial data transmission.	
			[2]
	(ii)	Give <b>two</b> benefits of transmitting the photographs using serial data transmission.	
		1	
		2	
			[2]
	(iii)	State <b>one</b> benefit of the student using parallel data transmission instead of serial data transmission.	ita
			[1]
(b)		photographs are also transmitted across a network to cloud storage. A device on the work forwards the data towards its correct destination.	ne
	(i)	State the name of this device.	
			[1]
	(ii)	Describe what is meant by cloud storage.	
			2
	(iii)	Give <b>one</b> disadvantage of storing the photographs in cloud storage instead of storing them locally.	าดู
			[1]

A p	rogra	ammer writes a computer program using a high-level language.	
(a)		x (✔) <b>one</b> box to show which statement is correct about writing computer progran-level language.	ms in a
	Α	Mnemonics are used to create instructions.	
	В	The computer program is harder to debug than a low-level language program.	
	С	The computer program is machine independent.	
	D	The hardware of the computer can be directly manipulated.	
			[1]
(b)	The	programmer uses a compiler to translate the computer program.	
	(i)	Describe how the compiler translates the computer program.	
			[3]
	(ii)	Describe how the compiler reports errors.	
			[2]
(0)	The	programmer uses an integrated development environment (IDE) to create the co	
(c)		gram.	Jiliputei
	One	e function of the IDE is that it has the built-in compiler.	
	Give	e three other common functions of an IDE.	
	1		
	2		
	3		
			[3]

6

(a)	Complete the statements ab	out cookies.			
	Use the terms from the list.				
	Some of the terms in the list	will <b>not</b> be used	d. Some terms	s may be used	more than once.
	compression	executable	h	ypertext markı	up language (HTML)
	hypertext transfer protocol (	HTTP)	image	internet	protocol (IP) address
	persistent	session		sound	text
	uniform resource locater	(URL)	web bro	owser	web server
	Cookies are small			. files that a	are sent between a
		and a			
		cookie	es are stored	in memory a	nd <b>not</b> in the user's
	secondary storage.				
	When the web browser is	closed a			cookie is lost,
	whereas a		cookie is	not lost.	[6]
(b)	Give <b>three</b> functions of a co	okie.			
	1				
	2				
	3				

- 7 A distributed denial of service attack (DDoS) is a cyber security threat.
  - (a) Draw and annotate a diagram to represent the process of a DDoS.

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[6]

	(D)	Sta	ate <b>two</b> aims of carrying out a DL	JOS attack.	
		1			
		2			
				[	2]
	(c)	Giv	e <b>two</b> security solutions that can	be used to help prevent a DDoS attack being successfu	ıl.
		1			
		2			
					2]
_					
8		-	uter is connected to a network a	-	
	(a)	Tic	k (✓) one box to show which dev	vice would assign the IPv4 address to the computer.	
		A	Domain name server (DNS)		
		В	Network interface card (NIC)		
		С	Router		
		D	Web server		
					[1]
	(b)	De	scribe the characteristics of an IF	<sup>2</sup> v4 address.	
					4]

One	e component of an expert system is the interence engine.	
(a)	Identify the <b>three</b> other components in an expert system.	
	1	
	2	
	3	
		[3]
(b)	Describe the role of the inference engine in an expert system.	
		[2]

10 A user has both system software and application software installed on their computer.

(a)	Describe the difference between system software and application software.
	Give an example of each software in your answer.
	[4
(b)	State which component in the computer would store both types of software when the power is turned off.
	T-4

## **BLANK PAGE**

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