

## **Cambridge International Examinations**

Cambridge International General Certificate of Secondary Education

CANDIDATE NAME			
CENTRE NUMBER		CANDIDATE NUMBER	
COMPUTER S	CIENCE		0478/12
Paper 1 Theor	у		May/June 2017
			1 hour 45 minutes
Candidates and	swer on the Question Paper.		
No Additional N	Materials are required.		
No calculators	allowed.		

## **READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name in the spaces at the top of this page.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer all questions.

No marks will be awarded for using brand names of software packages or hardware.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [ ] at the end of each question or part question.

The maximum number of marks is 75.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.





1	Name three different buses that are used in the fetch-execute cycle.
	Bus 1
	Bus 2
	Bus 3
	[3]
2	Give two examples of primary, secondary and off-line storage.
	Primary
	Example 1
	Example 2
	Secondary
	Example 1
	Example 2
	Off-line
	Example 1
	Example 2[6]

3 The diagram shows **five** output devices and **five** descriptions.

Draw a line between each output device and its description.

## Output Device Description Inkjet printer Flat panel display that uses the light modulating properties of liquid crystals. LCD screen Flat panel display that uses an array of light-emitting diodes as pixels. 2D cutter Droplets of ink are propelled onto paper. LED screen Electrically charged powdered ink is transferred onto paper. Laser printer High powered laser that uses the x-y plane.

[4]

There are various methods used to detect errors that can occur during data transmission and storage.
Describe each of the following error detection methods.
Parity check
Check digit
Checksum
Automatic Repeat request (ARQ)

(a)	The d	enary	numbe	er 57 i	is to	be sto	red in	two diff	erent c	ompute	er regist	ers.	
	Conve	ert 57 f	from d	enary	to b	inary a	and sh	ow you	workir	ng.			
(b)	Show	the bi	nary n	umbe	r froi	m <b>part</b>	( <b>a)</b> as	it woul	d be st	ored in	the follo	owing	registers.
										Re	egister 1		
													Registe
		wo otl	her us			-		stored					
	Use 2												
(d)	A regi	ster in	a com	nputer	con	tains b	inary (	digits.					
			0		0	1	1	1	0	1	0		
	The c	ontent	s of th	e regi	ster	repres	ent a l	oinary ir	nteger.			1	
	Conve	ert the	hinary	/ inted	er to	hexa	decima	al.					
			Dillial y										

6 Airline boarding passes can be read from a smartphone instead of a printout.



Identify who	 f barcode	A is an	example o	f. Explain	how the	data store	d in this type o
							ſΛ

- 7 Computer A is communicating with computer B.
  - (a) Draw an arrow or arrows to show simplex, duplex and half-duplex data transmission. The direction of the data transmission must be fully labelled.

## Simplex data transmission





**Duplex data transmission** 





Computer A

Half-duplex data transmission





Computer L

[6]

**(b)** State a use for the following data transmission methods. The use must be different for each data transmission method.

Simplex	
· ·	
Duplex	
Zapiex	

[2]

(c)	A computer includes an Integrated Circuit (IC) and a Universal Serial Bus (USB) for d transmission.	ata
	Describe how the computer uses these for data transmission, including the type of d transmission used.	ata
	IC	
	USB	
		 [4]

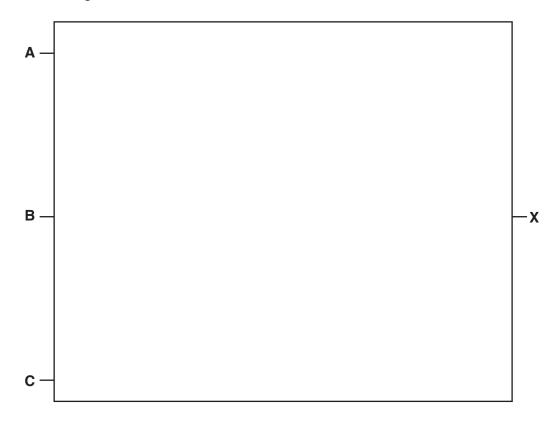
8

A co	ompany has a number of offices around the world.
(a)	Data is transmitted between the offices over the Internet. In order to keep the data safe the company is using Secure Socket Layer (SSL) protocol and a firewall at each office.
	Explain how SSL protocol and a firewall will keep the company's data safe.
	SSL protocol
	Firewall
	[4]
(b)	A company stores personal details of its customers on a computer system behind a firewall.
	Explain, with reasons, what else the company should do to keep this data safe.
	[6]

A cold store is kept at a constant low temperature using a sensor, a microprocessor and a cooling unit.
Explain how the sensor and microprocessor will maintain a constant low temperature.
ISI

**10** For this logic statement:

(a) Draw the logic circuit.



**(b)** Complete the truth table for the given logic statement.

Α	В	С	Working space	x
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

[4]

[4]

A company sells smartphones over the Internet.

Explain how the information stored on the company's website is requested by the customer, sent to the customer's computer and displayed on the screen.

 [7]

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