

# **Cambridge IGCSE**<sup>™</sup>

CANDIDATE NAME					
CENTRE NUMBER			CANDIDATE NUMBER		

# 440145142

**COMPUTER SCIENCE** 

0478/11

Paper 1 Theory

May/June 2020

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.

1 An image of a smartphone is shown.



(a)	lder	ntify <b>one</b> input device that is part of the smartphone.	
(b)	lder	ntify <b>two</b> output devices that are part of the smartphone.	[1
` ,			
	2		 [2
(c)	All s	smartphones have a MAC address.	
	(i)	State what is meant by the term MAC address.	
	(ii)	Describe the structure of a MAC address.	
			ارع: 

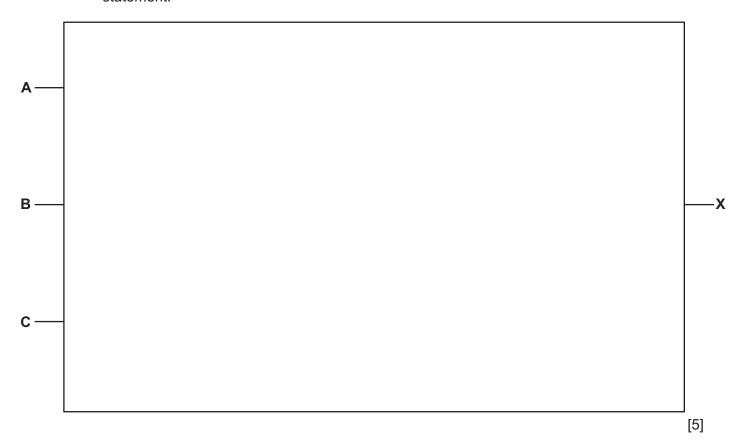
(d)	A sr	nartphone needs both RAM and ROM.					
	Stat	e why a smartphone needs RAM and ROM.					
	RAM						
	ROI	М					
			[2]				
(e)	Mod	dern smartphones can be secured with a biometric system that is built into the phone.					
	(i)	Identify <b>two</b> biometric systems that would be suitable for securing a smartphone.					
		1					
		2					
			[2]				
	(ii)	Explain why modern smartphones are secured with a biometric system.					
			[2]				

# **2** Consider the logic statement:

$$X = (((A \text{ NAND } B) \text{ OR } (B \text{ XOR } C)) \text{ AND NOT } C)$$

(a) Draw a logic circuit to match the given logic statement.

All logic gates must have a maximum of **two** inputs. Do **not** attempt to simplify the logic statement.



**(b)** Complete the truth table to represent 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]

3

(	Car	la's computer has a USB port.
(	Car	la uses the USB port to connect her mobile device to her computer, to transfer her photos.
(	a)	Give <b>three</b> benefits of using a USB port to connect the mobile device to the computer.
		Benefit 1
		Benefit 2
		Benefit 3
		[3]
(	b)	State the type of data transmission used when transferring data using a USB port.
		[1]
(	c)	Carla wants to reduce the file size of the photos she has transferred to her computer. She does not want the quality of the photos to be reduced, so she uses lossless compression.
		Describe how lossless compression reduces the file size of the photos.

IWC	error detection methods that Allison's computer uses are check digit and checksum.	
(a)	Give <b>two</b> similarities between the check digit and checksum methods.	
	1	
	2	
		[2]
		[4]
(b)	Identify <b>one other</b> error detection method that Allison's computer could use.	
	Describe how the method checks for errors.	
	Method	
	Description	
		[4]
		[+]

# **5 Six** components of a computer are given.

Some are part of the central processing unit (CPU) of the Von Neumann model for a computer system.

Tick (✓) to show if each component is a **CPU component** or is **Not a CPU component**.

Component	CPU component (✓)	Not a CPU component (✓)
Arithmetic logic unit (ALU)		
Hard disk drive (HDD)		
Memory address register (MAR)		
Random access memory (RAM)		
Solid state drive (SSD)		
Control unit (CU)		

[6]

# 6 Four scenarios are given.

Identify the most suitable sensor for each scenario.

A different sensor must be used for each scenario.

Sensor	Scenario
	Detecting when a person is approaching an automatic door system
	Monitoring the pollution level in a river
	Checking if a tropical aquarium is 25 degrees Celsius
	Counting the number of cars that cross a bridge

[4]

7 Hans has a website selling comic books. Customers can create an account to buy the comic books.

(a) Customers may worry about keylogging software being used to gain unauthorised access to

Customers enter a username and password to log in to their account.

	thei	ir account.	
	(i)	Describe how keylogging software can be used to gain unauthorised access to customer's account.	э а
			[4]
	(ii)	Identify a feature that Hans can add to the website to limit the threat of keylogg software.	jing
			[1]
(b)	Har	ns makes sure data transmission for his website is secure.	
	(i)	State how customers can check that the personal details they enter into the website be transmitted securely.	will
			[1]
	(ii)	Explain how a customer's browser checks that the website is secure.	
			[4]

Ber	ny is a photographer and prints his photos using an inkjet printer.
(a)	Benny is printing some photos and the paper gets jammed in the printer.
	A signal is sent to alert the computer about the paper jam.
	State the name of this type of signal.
	[1]
(b)	Identify <b>one</b> benefit and <b>two</b> drawbacks of Benny using an inkjet printer, instead of a laser printer, to print his photos.
	Benefit
	Drawback 1
	Drawback 2
	[3]
(0)	Four statements are given about printers

(c) Four statements are given about printers.

8

Tick (✓) to show whether the statement applies to an **Inkjet** printer or a **Laser** printer.

Statement	Inkjet (√)	Laser (✓)
Uses a rotating drum to transfer the image to the paper		
Uses powdered toner		
Uses nozzles to spray droplets on to the paper		
Uses a print head mechanism that moves side to side		

[4]

Pro	gram	s can be written in a low-level language.
(a)	Ider	ntify <b>three</b> features of a low-level language.
	Fea	ture 1
	Fea	ture 2
	Fea	ture 3[3]
(b)	Give	e <b>two</b> examples of a low-level language.
	Exa	mple 1
	Exa	mple 2
		[2]
(c)		e <b>one</b> drawback of writing programs in a low-level language, instead of a high-level guage.
		[1]
(d)		ow-level language needs to be converted to binary before it can be processed by a puter.
	(i)	Give the <b>8-bit binary</b> value of the two denary values:
		180
		201[2]
		Working space

(ii)	Give the 12-bit binary value of the denary value 250.
	[1]
	Working space
(iii)	Binary can be represented as hexadecimal to make it easier to read.
	Give the <b>hexadecimal</b> values of the 8-bit binary values:
	10010011
	00011101[2]
	141

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