

Cambridge O Level

CANDIDATE NAME					
CENTRE NUMBER			CANDIDATE NUMBER		

8 4 5 2 7 3 6 3 8 4

COMPUTER SCIENCE

2210/11

Paper 1 Theory

May/June 2021

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 Benedict has a computer that is assigned an Internet Protocol (IP) address. The IP address is:

198.167.214.0

The IP address is represented as denary values.

(a)	Convert the denary	values 167	and 214 from the IF	Paddress to 8-bit binary
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167	7										
214	4										
Wor	king space										
									[2]		
Ben	nedict's computer is also assigned a Media Access Control (MAC) address. Identify one similarity between an IP address and a MAC address.										
(ii)	Identify tw	o differe	nces bet	ween an	IP addre				[1]		
	Difference	1									
	Difference	2									
									[2]		
	214 Wor	Benedict's com (i) Identify or (ii) Identify two Difference	Working space Benedict's computer is (i) Identify one similar (ii) Identify two differe Difference 1	Working space Benedict's computer is also assign (i) Identify one similarity between the computer is also assign (ii) Identify two differences between the computer is also assign (iii) Identify two differences between the computer is also assign (iii) Identify two differences between the computer is also assign (iii) Identify two differences between the computer is also assign (iii) Identify two differences between the computer is also assign (iiii) Identify two differences between the computer is also assign (iiii) Identify two differences between the computer is also assign (iiii) Identify two differences between the computer is also assign (iiii) Identify two differences between the computer is also assign (iiii) Identify two differences between the computer is also assign (iiii) Identify two differences between the computer is also assign (iiii) Identify two differences between the computer is also assign (iiii) Identify two differences between the computer is also assign (iiii) Identify two differences between the computer is also assign (iiii) Identify two differences between the computer is also assign (iiii) Identify two differences between the computer is also assign (iiii) Identify two differences between the computer is also assign (iiii) Identify two differences between the computer is also assign (iiii) Identify two differences between the computer is also assign (iiiiii) Identify two differences between the computer is also assign (iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	Working space Benedict's computer is also assigned a M (i) Identify one similarity between an IP (ii) Identify two differences between an Difference 1	Working space Benedict's computer is also assigned a Media Acc (i) Identify one similarity between an IP address Cii) Identify two differences between an IP address Difference 1	Working space Benedict's computer is also assigned a Media Access Conf (i) Identify one similarity between an IP address and a Maccess Conf (ii) Identify two differences between an IP address and a Difference 1	Working space Benedict's computer is also assigned a Media Access Control (MAC (i) Identify one similarity between an IP address and a MAC address Cii) Identify two differences between an IP address and a MAC address and a MA	Working space Benedict's computer is also assigned a Media Access Control (MAC) address (i) Identify one similarity between an IP address and a MAC address. (ii) Identify two differences between an IP address and a MAC address.		

2	Julia	inputs	personal	data	into	her	compute

She stores three copies of the data using a hard disk drive (HDD), a solid state drive (SSD) and a USB flash memory drive.

(a)	Identify three	devices Julia	can use to ir	put personal	data into her	computer.
\ \\	idoning tilloo	, actiocc cana	oan acc to n	ipat poi conai	aata iiito iioi	COLLIN

Device 1	
Device 2	
Device 3	
	[3]

(b) Six statements are shown about HDDs, SSDs and USB flash memory drives.

Tick (\checkmark) to show which statements apply to each type of storage. Some statements can apply to more than one type of storage.

Statement	HDD (√)	SSD (√)	USB flash memory drive (√)
it has no moving parts			
it is non-volatile			
it can use NAND gates to store data			
it uses magnetic properties to store data			
it has the smallest physical size			
it has the slowest read/write speeds			

[6]

(c)	a uses a USB connection to transfer data onto her USB flash memory drive.		
	(i)	One benefit of using a USB connection is that it is a universal connection.	
		State two other benefits of using a USB connection.	
		Benefit 1	
		Benefit 2	
			 [2]
	(ii)	Identify the type of data transmission used in a USB connection.	ا

3	A firewall ca	an be used to	help keep	the data secure	that is stored	on a compute

(a)	The given paragraph describes how the firewall operates to help keep the data secure.
	Complete the paragraph using the most appropriate terms from the given list. Not all of the

Complete the paragraph u	sing the most	t appropriate	terms fro	m the	given	list. N	lot all	of the
terms on the list need to be	used.							

- Accept
- Criteria
- Hacking
- Input
- Network
- Outgoing
- Output
- Processor
- Reject
- Software
- Store
- Storage

	A firewall can be or hardware based. It monitors traffic between	een
	the computer and the The user sets	
	for the traffic. The firewall will or	
	the traffic based on this. It can help prevent and malicide	ous
	software that could be a threat to the security of the data.	[6]
(b)	Identify three other methods that could be used to keep the data secure.	
	Method 1	
	Method 2	
	Method 3	
		[3]

Two internet risks are phishing and pharming.
Describe what is meant by phishing and pharming.
Phishing
Pharming
[6]

5 Jamelia has a greenhouse that she uses to grow fruit and vegetables. She needs to make sure the temperature in the greenhouse stays between 25 °C and 30 °C (inclusive).

A system that has a temperature sensor and a microprocessor is used to maintain the temperature in the greenhouse. The system will:

- open a window and turn a heater off if it gets too hot
- close a window and turn a heater on if it gets too cold.

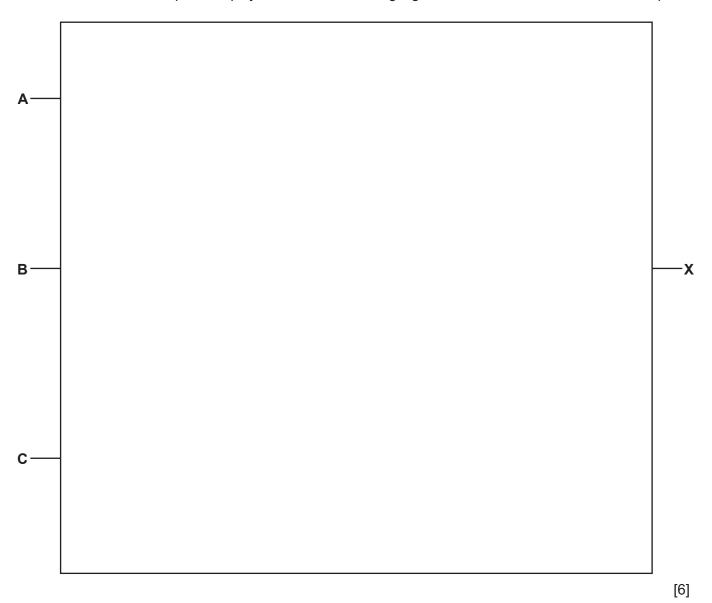
Describe how the system uses the temperature sensor and the microprocessor to maintain the temperature in the greenhouse.
[8]

6 Consider the logic statement:

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

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

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



(b) Consider the completed truth table for the given logic statement.

Row number	Α	В	С	Working space	Х
1	0	0	0		0
2	0	0	1		1
3	0	1	0		0
4	0	1	1		1
5	1	0	0		0
6	1	0	1		1
7	1	1	0		0
8	1	1	1		1

There are four errors in the truth table in the output (X) column.

Identify the **four** incorrect outputs.

\\/rita	tho	row	numbor	to	idontify	aach	incorrect	Quitnut
VVIILE	เมเษ	1000	HUHHDEL	ιU	IUGIIUIV	Each	IIICOITECL	output.

Row
Row
Row
Row

[4]

files.	company has a website that allows users to stream music. The music is stored in sound
(a) The	e sound files are compressed using lossless compression.
(i)	Describe how the sound files are compressed using lossless compression.
	[4]
(ii)	State one reason why the music company would compress the sound files using lossless, rather than lossy, compression.
	[1]
(iii)	Give one benefit, to the user, of the music company compressing the sound files.
	[1]
(iv)	Give one drawback of the music company using lossless, rather than lossy, compression for the sound files.
	[2]

(b)	Describe how the web pages for the website are requested and displayed on a user's computer.
	[4]
(c)	The web server that hosts the website suffers a denial of service (DoS) attack.
	Explain why this will prevent users from accessing the website.
	[2]

- **8** Four 7-bit binary values are transmitted from one computer to another. A parity bit is added to each binary value creating 8-bit binary values. All the binary values are transmitted and received correctly.
 - (a) Identify whether each 8-bit binary value has been sent using odd or even parity by writing odd or even in the type of parity column.

8-bit binary value	Type of parity
01100100	
10010001	
00000011	
10110010	

[4]

(b)	An e	error may not be detected when using a parity check.
	Ider	ntify why an error may not be detected.
		[1]
(c)	The	data is sent using parallel half-duplex data transmission.
	(i)	Describe how data is sent using parallel half-duplex data transmission.
		INI
	/::\	State true drowbacks of using parallel data transmission
	(ii)	State two drawbacks of using parallel data transmission.
		Drawback 1
		Drawback 2

[2]

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