QUESTION 1.

9 Draw a line to connect each question to the correct answer.

Question	Answer
What is the denary (base 10) equivalent to the hexadecimal digit **E**?	**8**
If 1 GB = 2^x then what is the value of X?	**12**
How many bits are there in one byte?	**14**
If the broadband data download rate is 40 megabits per second, how many seconds will it take to download a 60 MB file?	**19**
What is the denary (base 10) value of the binary number 0 0 1 0 0 1 0 0 ?	**30**
What hexadecimal value is obtained when the two hexadecimal digits **C** and **D** are added together?	**36**

[5]

QUESTION 2.

1 The memory of a computer contains data and instructions in binary.

The following instruction is stored in a location of the memory.

0	0	1	0	1	0	0	1	1	1	1	1	1	1	0	0

(a) Convert the instruction into hexadecimal.

.....

.....

..... [2]

(b) Explain why a programmer might prefer to read the instruction in hexadecimal rather than in binary.

.....

.....

.....

..... [2]

(c) Give **two** other uses of hexadecimal.

Use 1 .....

.....

Use 2 .....

.....

[2]

2 Programmers can use a high-level language to write a computer program.

(a) Explain what is meant by the term ‘high-level language’.

.....

.....

.....

..... [2]

(b) A program written in a high-level language is translated into machine code. can be processed by a computer.

Name one type of translator that can be used.

.....

(c) Describe how your answer to **part (b)** translates this program.

.....

.....

.....

.....

.....

.....

QUESTION 3.

5 **(a)** The denary number 57 is to be stored in two different computer registers.

Convert 57 from denary to binary and show your working.

.....

.....

.....

.....[2]

(b) Show the binary number from **part (a)** as it would be stored in the following registers.

								Register 1

															Register 2

[2]

(c) A binary number stored in a register can have many different uses, for example an address in main memory.

Give **two** other uses for a binary number stored in a register.

Use 1 .....

Use 2 .....

[2]

(d) A register in a computer contains binary digits.

0	**0**	**1**	**1**	**1**	**0**	**1**	**0**

The contents of the register represent a binary integer.

Convert the binary integer to hexadecimal.

.....

.....[1]

QUESTION 4.

10 Alexandra has a new mobile device.

It has a touch screen that uses capacitive technology.

(a) Describe how a capacitive touch screen registers Alexandra's touch.

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.....

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.....

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..... [4]

(b) Alexandra is wearing gloves because it is cold.

She presses an icon on her touch screen but her action is not registered.

(i) Explain why the touch screen will not register her touch.

.....

.....

.....

..... [2]

(ii) Alexandra does not want to remove her gloves.

Explain how Alexandra could use her mobile device whilst still wearing gloves.

.....

.....

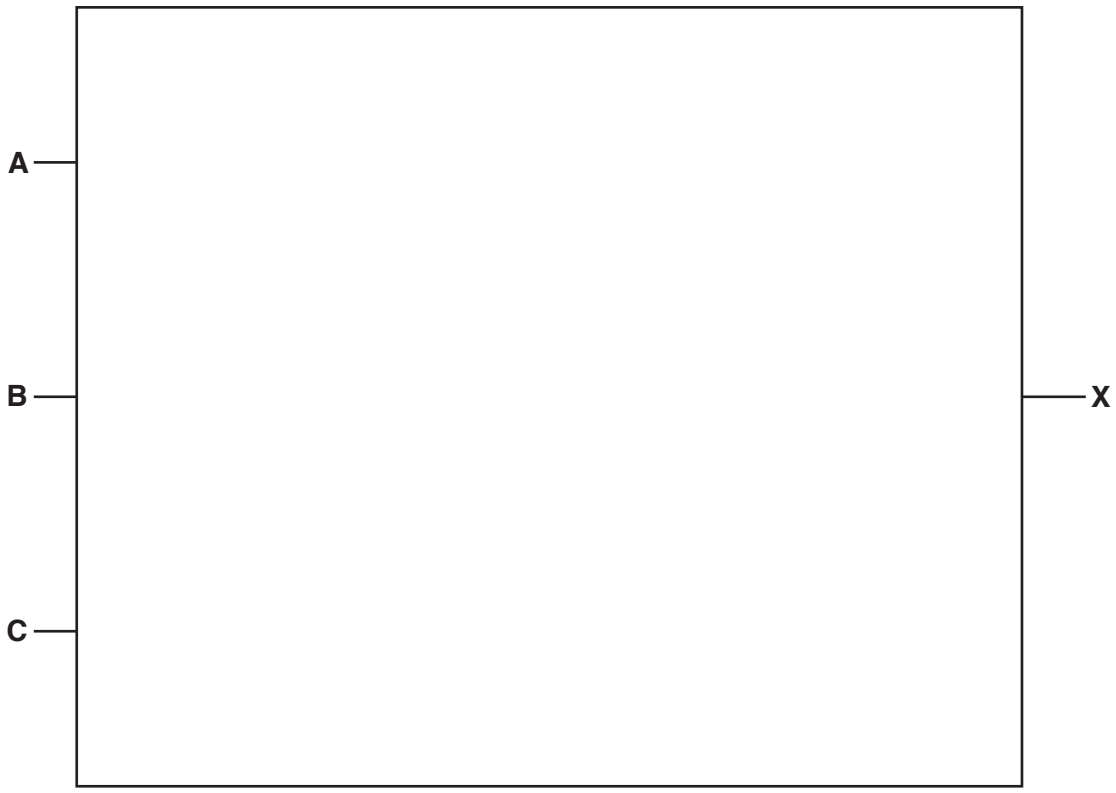
.....

..... [2]

QUESTION 5.

(b) Draw a logic circuit corresponding to this logic statement:

X = 1 if (A is NOT 1) OR ((B is 1 OR C is 1) AND (B is NOT 1 OR A is NOT 1))



[6]

9 Three types of translators are **assemblers**, **compilers** and **interpreters**.

Tick (✓) the appropriate boxes to show which statements apply to each type of translator.

Statement	**Assembler (✓)**	**Compiler (✓)**	**Interpreter (✓)**
Translates high-level language into machine code			
Provides error diagnostics			
Translates whole program to object code in one operation			
Translates and executes one line of code at a time			

[3]

QUESTION 6.

7 **(a)** Give the **denary** value of each of the three 12-bit binary values.

(i) 000000001100

.....

(ii) 000011000110

..... [1]

(iii) 010011000001

..... [1]

Working space

.....

.....

.....

.....

.....

.....

.....

(b) 12-bit binary values can also be represented as hexadecimal values.

Give the **hexadecimal** value of the 12-bit binary value.

000011101001

..... [3]

QUESTION 7.

4 The table shows **four** definitions.

Complete the table giving the missing **Term** for each definition.

Term	Definition
	A data transmission method that sends data one bit at a time, down a single wire
	An address given to a device on a network. The address is assigned by the network
	The software used to render HTML and display a web page
	An address given to a device at the manufacturing stage that can be used to identify the device on a network

[4]

QUESTION 8.

10 Characters can be represented in a computer by a numerical code.

The following list shows 16 characters with their numerical codes in denary:

a = 97	e = 101	k = 107	t = 116
b = 98	g = 103	m = 109	u = 117
c = 99	h = 104	o = 111	w = 119
d = 100	i = 105	r = 114	

. = 46 (code for the full stop)

Web addresses can be written using hexadecimal rather than denary. Hexadecimal codes are preceded by a % sign. For example, the word "**c a g e**" is written as:

either	99	97	103	101	(in denary)
or	%63	%61	%67	%65	(in hexadecimal)

(a) Complete the conversion of the following web address into hexadecimal:

w	w	w	.	c	i	e	.	o	r	g	.	u	k
%77	%77	%77											

[3]

(b) Complete the web address from the given hexadecimal codes:

%77	%77	%77	%2E	%72	%6F	%63	%6B	%69	%63	%74	%2E	%63	%6F	%6D
W	W	W												

[3]

11 A passenger logs onto an airline website and types in the reference number for their flight. Once the passenger accesses their account they can choose their seat and also print out a boarding pass which contains a unique barcode. This barcode is scanned at the airport check-in desk.

Name **one** input and **one** output device found at the check-in desk and give a reason for your choice.

Input device .....

Reason .....

.....

Output device .....

Reason .....

.....

[4]

QUESTION 9.

6 **(a)** Explain what is meant by HTML.

.....

.....

.....

.....

.....

..... [3]

(b) HTML uses both structure and presentation.

Describe what is meant by the two terms.

Structure .....

.....

.....

Presentation .....

.....

.....

[2]

(c) Explain the function of a web browser.

.....

.....

.....

.....

.....

.....[3]

QUESTION 10.

4 **(a)** Computer ethics involves a number of different topics.

(i) A student made the following statement on an examination paper:

"It allows a user to have the freedom to run, copy, change and adapt the softwa
then pass it on to a colleague, friend or family member."

Identify which computer term the student was describing.

..... [1]

(ii) Explain what is meant by computer ethics.

.....

.....

.....

.....

.....

..... [3]

(b) The four statements below refer to firewalls and proxy servers.

Study each statement.

Tick (✓) the appropriate column(s) to indicate whether the statement refers to a firewall and/or a proxy server.

Statement	Firewall	Proxy server
Speeds up access of information from a web server by using a cache		
Filters all Internet traffic coming into and out from a user's computer, intranet or private network		
Helps to prevent malware, including viruses, from entering a user's computer		
Keeps a list of undesirable websites and IP addresses		

[4]

(c) Explain **three** ways of preventing **accidental** loss or corruption of data.

1 .....

.....

.....

.....

2 .....

.....

.....

.....

3 .....

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[6]

QUESTION 11.

10 **(a)** A manufacturer of aeroplane engines assigns a denary identification num
engine.

One engine has the ID: 0431

(i) Convert this denary number to a 12-bit binary format.

[2]

(ii) Show how this number would be represented in hexadecimal.

.....

.....

[3]

(b) The current status of the engine is sent to a computer in the aeroplane.

Each piece of data collected is 8 bytes in size. Data collection occurs every 30 seconds.

Calculate the number of kilobytes that would be needed to store the data collected during a 10-hour flight. Show your working.

.....

.....

.....

.....

..... kilobytes

[3]

(c) At the end of the flight, all of the data are sent to the aeroplane engine manuf
Internet.

The computer in the aeroplane has a MAC address and an IP address.

State what is meant by these two terms.

MAC address .....

.....

.....

IP address .....

.....

.....

[2]

(d) When sending this data, security is very important. Data are sent over the Internet using Transport Layer Security (TLS) protocol.

Name the **two** layers that make up TLS.

1 .....

2 .....

[2]

QUESTION 12.

8 Kamil correctly answers an examination question about a number of internet term

Six different terms have been removed from Kamil's answer.

Complete the sentences in Kamil's answer, using the list given. Not all terms in the list need used.

- browser
- connection
- domain name server (DNS)
- Internet
- Internet Service Provider (ISP)
- IP address
- MAC address
- network
- protocol
- uniform resource locator (URL)
- webpages
- hypertext mark-up language (HTML)

A ..... is a program that allows a user to view ..... .

An ..... is a company that provides a connection to access the ..... .

The main ..... that governs the transmission of data using the Internet is http.

The ..... is provided by the network, and given to each device on the network.

[6]

QUESTION 13.

7 **Six** internet terms and **six** definitions are listed.

Draw a line to connect each term to a correct definition.

Internet term	Definition
Browser	A program that allows a user to view webpages
Internet Service Provider (ISP)	The main protocol that governs the transmission of data using the Internet
Hyper Text Transfer Protocol (HTTP)	The website address that is typed into the address bar
Uniform Resource Locator (URL)	An address given to each device on a network. It is provided by the network
MAC address	A unique address given to a device on a network. It is provided by the manufacturer
IP address	A company that provides a connection to access the Internet

[5]

8 Describe the purpose of an interrupt in a computer system.

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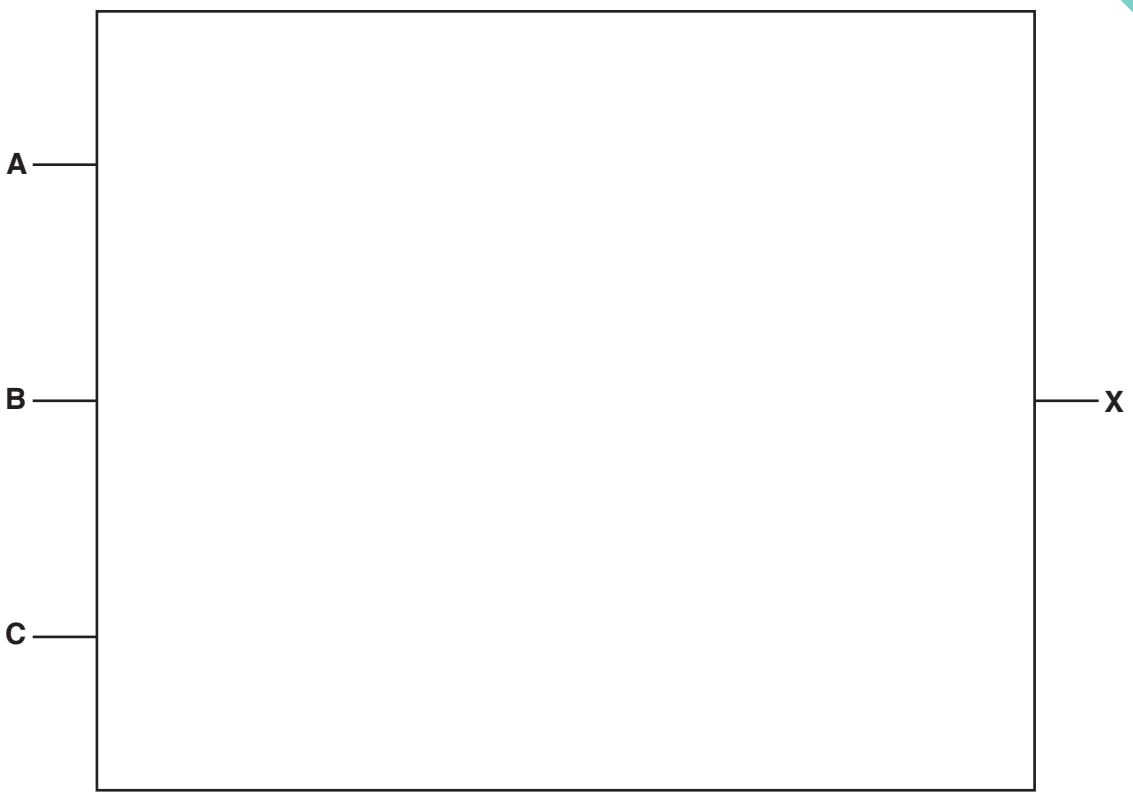
.....

.....[4]

(b) Draw a logic circuit corresponding to the logic statement:

X = 1 if ((A is 1 AND B is 1) AND (A is 1 OR C is NOT 1)) OR (B is 1 AND C is NO



[6]

11 The fetch-execute cycle make use of registers.

(a) Describe the role of the Program Counter (PC).

.....

.....

.....

.....[2]

(b) Describe the role of the Memory Data Register (MDR).

.....

.....

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.....[2]

5 The contents of three binary registers have been transmitted from one computer to another. **parity** has been used as an error detection method.

The outcome after transmission is:

- **Register A** and **Register B** have been transmitted **correctly**.
- **Register C** has been transmitted **incorrectly**.

Write the appropriate **Parity bit** for each register to show the given outcome.

	Parity bit							
Register A		0	1	0	0	0	1	1
Register B		0	0	0	0	1	1	1
Register C		0	0	0	0	0	1	1

[3]

6 Jesse is taking his Computer Science examination. He answers **five** questions about ethics.

(a) For the first question, he writes the answer:

"This type of software can be copied and shared without the permission of the owner."

State what Jesse is describing.

..... [1]

(b) For the second question, he writes the answer:

"With this type of software, the owner still retains the copyright for the software, but he gives away copies of it for free."

State what Jesse is describing.

..... [1]

(c) For the third question, he writes the answer:

"This type of software is often a trial version of the full software. To use the full version the user normally needs to pay a fee."

State what Jesse is describing.

..... [1]