

QUESTION 1.

14

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



Question

What is the denary (base 10) equivalent to the hexadecimal digit **E**?

8

If $1\text{ GB} = 2^x$ 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.

12



- (d) Describe **three** tasks carried out by a firewall.

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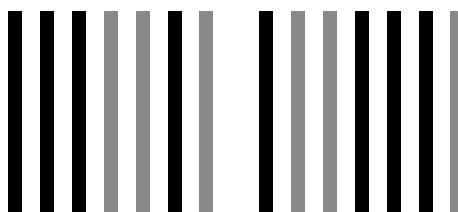
[3]

- 9 In the following barcode, each binary number is made up of seven bars.

Each bar is black or grey.

A black bar is interpreted as a “1” and a grey bar is interpreted as a “0”.

- (a) Write the binary numbers that would be produced from this barcode:



Binary number A Binary number B

Binary number A:

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Binary number B:

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[2]

- (b) This barcode system uses odd parity.

Write the parity bit for each of the binary numbers in **part (a)**:

Parity bit

Binary number A:

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Binary number B:

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[2]

QUESTION 3.

5

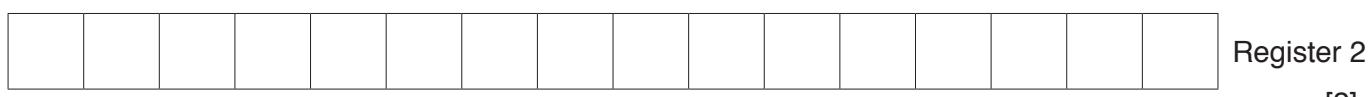
- 5 (a) The denary number 57 is to be stored in two different computer registers.

Convert 57 from denary to binary and show your working.

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[2]

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



[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
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The contents of the register represent a binary integer.

Convert the binary integer to hexadecimal.

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[1]

QUESTION 4.

3

- 3 The three binary numbers in the registers A, B and C have been transmitted from another.



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

One binary number has been transmitted incorrectly. This is identified through the use of a parity bit.

Identify which register contains the binary number that has been transmitted **incorrectly**. Explain the reason for your choice.

The binary number that has been transmitted incorrectly is in **Register**

Explanation

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[4]

QUESTION 5.

6

- 5 (a) Convert the denary number 107 to binary.

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- (b) Represent the denary number 300 as it would be stored in a 12-bit binary register.

..... [2]

- (c) Convert the denary number 179 to hexadecimal.

..... [2]

- 6 One of the roles of an operating system is to deal with interrupts.

- (a) Explain the term interrupt.

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..... [2]

- (b) Identify **three** devices that make use of interrupts.

Device 1
Device 2
Device 3 [3]

QUESTION 6.

7

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

(i) 000000001100

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(ii) 000011000110

..... [1]

(iii) 010011000001

..... [1]

Working space

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- (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.

2

- 1 Pradeep is reading hexadecimal values for a project he is working on.

- (a) The first three hexadecimal values he reads are **15**, **102** and **A9**.

Give the **denary** values for the three hexadecimal values.

15

102

A9

[3]

Working space

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- (b) Pradeep has two 8-bit binary values that he needs to convert to hexadecimal values for his project.

Give the **hexadecimal** values for the two 8-bit binary values.

01010000

00111101

[4]



QUESTION 8.

10



- 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.

3

- 2 Storage devices and storage media can be categorised as primary, secondary or off-line.

Write **primary**, **secondary** or **off-line** next to each storage device or medium to indicate its suitable category.



HDD [6]

RAM [6]

ROM [6]

CD-ROM [6]

SSD [6]

DVD-RAM [6]

[6]

- 3 (a) Explain the differences between the binary number system and the denary number system.

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[4]

- (b) Explain the process of converting the binary number 1010 into a denary number.

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[5]

QUESTION 10.

4

- 2 (a) Six binary or hexadecimal numbers and six denary conversions are given.

Draw a line to connect each binary or hexadecimal number to the correct denary value.



Binary or hexadecimal

01001011

4E

11011010

10011101

A7

19

Denary

75

78

157

167

25

218

[5]

- (b) Hexadecimal is often used by computer programmers to represent binary values.

Explain why computer programmers may choose to use hexadecimal.

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[2]

QUESTION 11.

2

- 1 Computers use a character set to convert text into binary.

One character set that can be used is ASCII.

Each letter in ASCII can also be represented as a denary value.

- (a) The word BUS has the denary values:

B	U	S
66	85	83

Convert the denary values into 8-bit binary.

66

--	--	--	--	--	--	--	--

85

--	--	--	--	--	--	--	--

83

--	--	--	--	--	--	--	--

[3]

- (b) Each letter in ASCII can also be represented as a hexadecimal value.

The word KEY has the 8-bit binary values:

K	E	Y
01001011	01000101	01011001

- (i) Convert the three 8-bit binary values into hexadecimal.

01001011

01000101

01011001

[3]



- (ii) Give **three** other uses of hexadecimal notation in computer science.

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[3]

- (iii) State **two** benefits of using hexadecimal notation to represent binary values.

Benefit 1

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Benefit 2

QUESTION 12.

3

- 2 An electronic guessing game compares denary integer values input by a user. The pre-stored values are held in 10-bit binary format.

- (a) Convert the binary values in the table to denary.

Binary	Denary
0001001110	
0110110111	
1000000001	

[3]

- (b) When planning the game, the designer decided to use hexadecimal notation to represent the binary values.

Explain why the designer used hexadecimal notation.

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..... [2]

- (c) State the hexadecimal equivalent of the binary value 1010110101

..... [3]

- 3 A company has several offices. It uses the Internet to transfer data between offices. The company also makes payments to staff and suppliers using online banking.

The company are concerned about spyware and other security aspects of using the Internet.

- (a) Explain what is meant by spyware **and** how it is used to obtain data.

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..... [3]

QUESTION 13.

3

- 4 An 8-bit binary register contains the value:

0	0	1	1	0	1	0	0
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- (a) Convert the binary value to denary.

..... [1]

- (b) The contents of the register shifted one place to the right would give the result:

0	0	0	1	1	0	1	0
---	---	---	---	---	---	---	---

The contents of the register shown at the start of question 4 are shifted two places to the left.

Show the contents of the register after this shift has taken place.

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[1]

- (c) State the effect this shift has on the denary value in **part (a)**.

..... [1]

- 5 Audrey wants to send a sound file to Nico using email.

The file is too large to attach to an email so Audrey decides to compress the file.

She uses lossy compression to reduce the size of the sound file.

- (a) Describe how lossy compression reduces the size of the sound file.

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