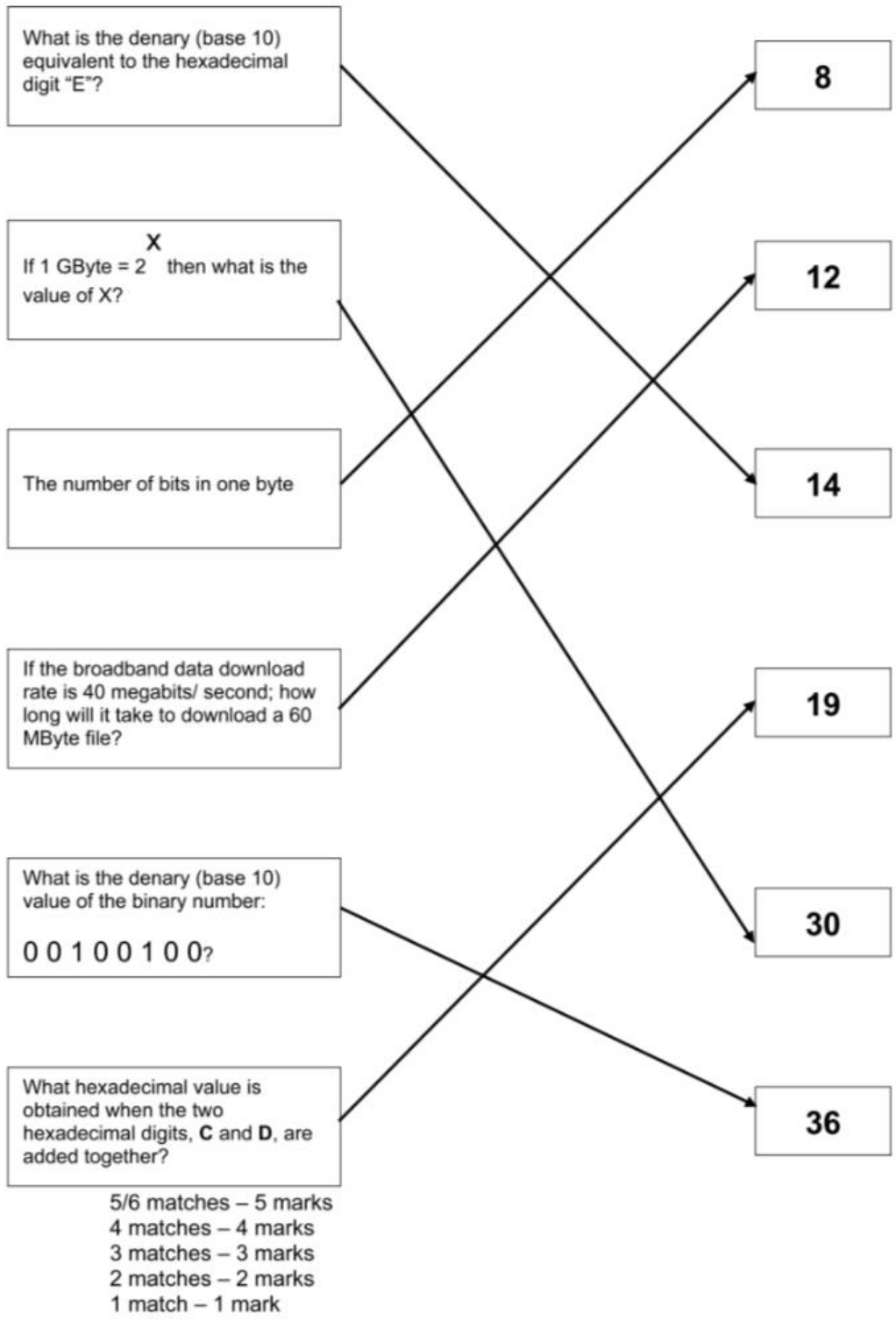
Question	Answer	Marks
7	High definition video – lossy (algorithm) – images may contain less detail without noticeable degradation in quality Text – lossless (algorithm) – so that the original and the decompressed text will be exactly the same	4

Question	Answer	Marks
8(a)	Denary – 55 Hexadecimal – 37	2
8(b)	Binary – (00)111001 Denary – 57 Hexadecimal – 39	3
8(c)	**0/1 | 0/1 | 0 | 0 | 0/1 | 1 | 1 | 1**	1

Question	Answer	Marks
12(a)	1 mark for appropriate use and 1 mark for suitable example for up to three uses e.g. HTML colours e.g. blue `0000FF` Display machine code/programs/memory dump e.g. `5F 3A 09 F1` Display (MAC) addresses e.g. `01-23-45-67-89-AB-CD` Display ASCII/Unicode values e.g. `%41` for A Display error codes e.g. error #404 page not found	6
12(b)	Any **two** from: easier for programmers to read and understand easier to find errors conversion to binary easier than denary to binary more can be displayed on a screen for addresses etc. // smaller display screens can be used faster than binary for entering numbers	2

9



5/6 matches – 5 marks
4 matches – 4 marks
3 matches – 3 marks
2 matches – 2 marks
1 match – 1 mark

[5]

10 (a) 1 mark for two correct lines, 2 marks for four correct lines

L (108):	**0**	**1**	**1**	**0**	**1**	**1**	**0**	**0**
I (105):	**0**	**1**	**1**	**0**	**1**	**0**	**0**	**1**
G (103):	**0**	**1**	**1**	**0**	**0**	**1**	**1**	**1**
N (110):	**0**	**1**	**1**	**0**	**1**	**1**	**1**	**0**

[2]

(b) 1 mark for each correct binary value
1 mark for each correct hexadecimal value

									hexidecimal
L:	**1**	**1**	**0**	**1**	**1**	**0**	**0**	**0**	**D8**
G:	**1**	**1**	**0**	**0**	**1**	**1**	**1**	**0**	**CE**

[4]

7 (a) **1** mark for each correct binary value

3	**0**	**0**	**1**	**1**
5	**0**	**1**	**0**	**1**

[2]

(b)

0	**0**	**0**	**1**	→ **1**
1	**0**	**0**	**1**	→ **9**
0	**1**	**0**	**0**	→ **4**
1	**1**	**1**	**0**	→ **E**

1 mark (for 1, 9, 4)
1 mark (for E)

[2]

3 **(a)** **1** mark for each nibble

0100 1010 1111 [3]

(b) **(i)**

0 1 1 0 1 0 0 1	105 hours	1 mark
0 0 0 1 1 1 1 1	31 minutes	1 mark
0 0 1 1 0 0 1 0	50 seconds	1 mark [3]

(ii) 1F [1]

4 **(a)** Any **three** from:
- The file can be compressed
- The compression that is used is lossless (not lossy)
- use of a compression algorithm
- repeated words can be indexed
- repeated word sections (e.g. "OU") can be replaced by a numerical value
- reference to zip files
- save file as a pdf/convert to pdf [3]

(b) Any **four** from:
- the checksum for the bytes is calculated
- this value is then transmitted with the block of data
- at the receiving end, the checksum is re-calculated from the block of data received
- the calculated value is then compared to the checksum transmitted
- if they are the same value, then the data was transmitted without any error
- if the values are different, then an error has been found
- if the values are different, then a request is sent for the data to be re-transmitted [4]

Question	Answer	Marks
1(a)	1 mark for **any** two correct values, 2 marks for all 4 correct values. 29FC	**2**
1(b)	**Two** from: Easier/quicker to understand/read Easier to debug/identify errors Fewer digits are used / shorter // takes up less space on screen // more can be shown on screen / page	**2**
1(c)	**Two** from: Notations for colour in HTML // HTML colour (codes) Error messages MAC address // IP address Locations in memory Memory dump	**2**

3	1 mark per correct tick **Statement** / **true (✓)** / **false (✓)** 47KB is larger than 10MB. / / ✓ 250bytes is smaller than 0.5MB. / ✓ / 50GB is larger than 100MB. / ✓ / 1TB is smaller than 4GB. / / ✓	**4**

Question	Answer	Marks
5(a)	1 mark for correct method, 1 mark for correct answer 32 + 16 + 8 + 1 (00)111001	**2**
5(b)	registers **must** have leading zeros, allow follow through from 5(a) for an incorrect value 1 mark for each correct register. **0 0 1 1 1 0 0 1** **0 0 0 0 0 0 0 0 0 0 1 1 1 0 0 1**	**2**
5(c)	**Two** from: data ASCII value / Unicode value / character number part of image / small image a sound / sound sample / small sound track instruction	**2**
5(d)	3A	**1**

Question	Answer	Marks
2	1 mark for each correct file format e.g. **File type** / **File format** Pictures / .JPEG Text / .doc, .txt, .rtf, .docx, .odt .pdf Sound / .mp3, .wav, .aif, .flac, .mid Video / .mp4, .flv, .wmv	**3**

Question	Answer	Marks
1	1 mark per correct instruction: 9 – LEFT 1 – DOWN C – OPEN 3 – CLOSE F – UP	5

Question	Answer	Marks
3(a)	Any **four** from (**Max 2** per number system) : A binary number system is a base-2 system A denary number system is a base-10 system A binary number system uses 0 and 1 values A denary number system uses 0 to 9 values A binary number system has units/ placeholders/column headings that increase by the power of 2 A denary number system has units/ placeholders/column headings that increase by the power of 10 Binary has more digit for the same value// Denary has less digits for the same value	4

Question	Answer	Marks
3(b)	**Five** from: Correct column headings / place holders by example Correctly place a 1 or a 0 for each column Identify the columns to be added Add together the (denary) values identified … … this will give a total which is the denary number/answer Answer is 10	5

2 **(a)** 1 0 1 1 0 1 0 1

F 6 [2]

(b) Any **two** from:
- HTML
- MAC address
- used in assembly language/machine code
- debugging (displays bytes in hex when using memory dumps)

[2]

(c)
- Can represent 16 bit words as only 4 hexadecimal digits
- It is easy to convert hex digits back to binary if necessary [2]

7 **(a)** Lossy
- when decompressed, some detail is lost and file is not exactly like the original (but difference is usually not noticeable)

Lossless
- when decompressed the original file is restored with no loss of data

[2]

(b) 1 mark for type of file + 1 mark for description
e.g:

- JPG
- Used to store images/pictures

- MP3
- Used to store audio/sound files

[2]

9 **(a)** Any **one** from:
- verification is being described
- validation is when data follows a set of rules, e.g. length/range/type check

[1]

(b) Any **one** from:
- send as JPEG files
- carry out a file compression first

[1]

10 (a)

w	w	w	.	c	i	e	.	o	r	g	.	u	k
%77	%77	%77	%2E	%63	%69	%65	%2E	%6F	%72	%67	%2E	%75	%6B

1 mark 1 mark 1 mark

[3]

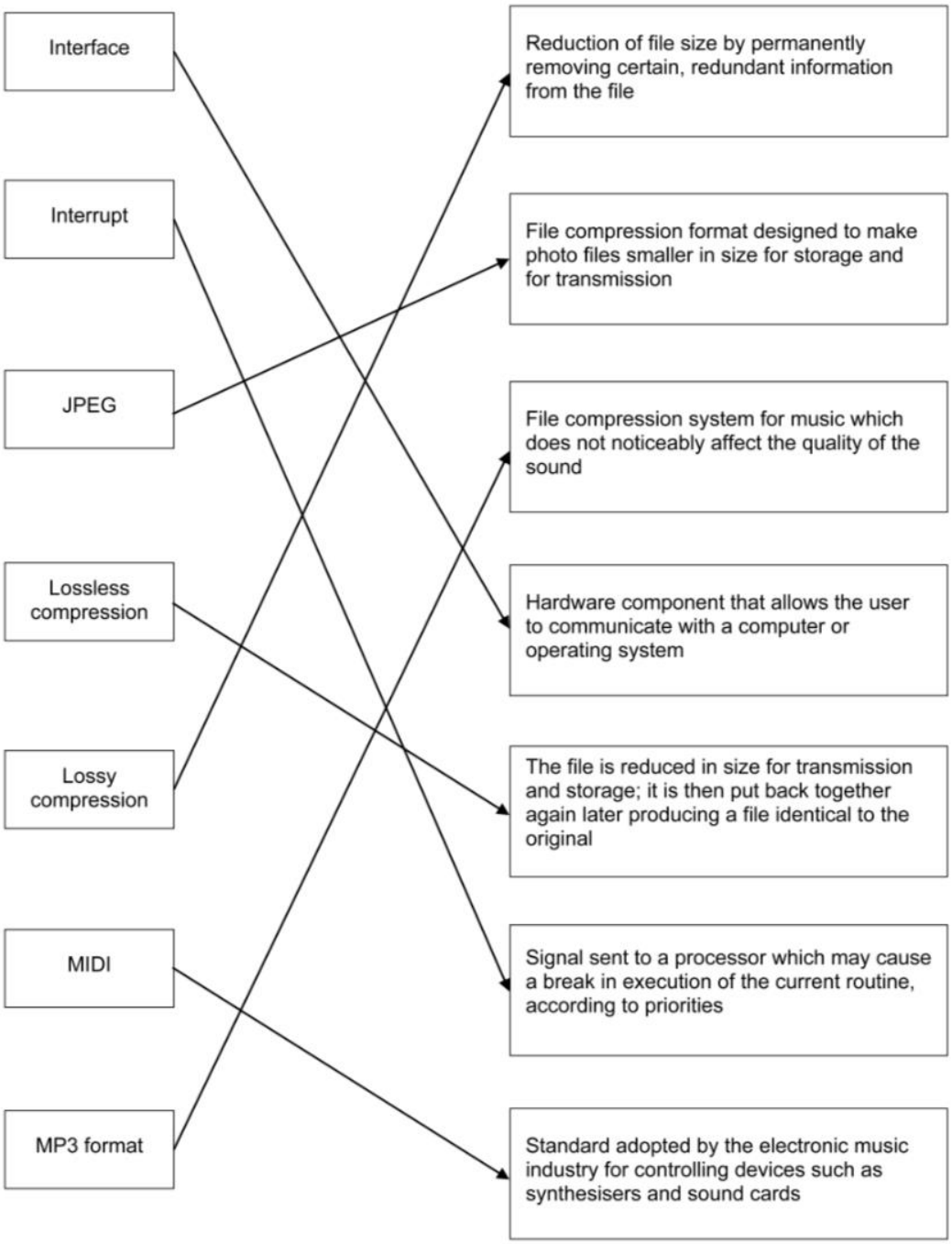
(b)

%77	%77	%77	%2E	%72	%6F	%63	%6B	%69	%63	%74	%2E	%63	%6F	%6D
W	W	W	.	r	o	c	k	i	c	t	.	c	o	m

1 mark 1 mark 1 mark

[3]

2


Interface
Interrupt
JPEG
Lossless compression
Lossy compression
MIDI
MP3 format
Reduction of file size by permanently removing certain, redundant information from the file
File compression format designed to make photo files smaller in size for storage and for transmission
File compression system for music which does not noticeably affect the quality of the sound
Hardware component that allows the user to communicate with a computer or operating system
The file is reduced in size for transmission and storage; it is then put back together again later producing a file identical to the original
Signal sent to a processor which may cause a break in execution of the current routine, according to priorities
Standard adopted by the electronic music industry for controlling devices such as synthesisers and sound cards

[6]

4 (a) (i) For each hex number, 2 marks if all correct, 1 mark for 2 correct conversions

F A 7: **1 1 1 1 1 0 1 0 0 1 1 1**

D 3 E: **1 1 0 1 0 0 1 1 1 1 1 0**

[4]

(ii) 2 marks if all correct, 1 mark for 2 correct conversions – Follow through

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

[2]

(iii) 2 marks if all correct, 1 mark for 2 correct conversions – Follow through
D 2 6 [2]

(b) (i) (X) FF FF 00

(Y) FF 00 FF

(Z) 00 FF FF [3]

(ii) – hex values between 0 to F are combined together to create a hex code
– different combinations in hex codes will create different shades/tones/colours [2]

(c) (i) First six digits: manufacturer code/manufacturer ID

Last six digits: serial number/serial ID of device/product [2]

(ii) Allows all devices to be uniquely identified [1]

9 **(a)** 8 MB
100 [2]

(b) **(i)** Any **two** from:
– removes sounds human ear can't hear very well
– if two sounds played at same time, softer sound removed
– uses perceptual music shaping [2]

(ii) Lossy [1]

(iii) **One** from, for example:
– jpeg
– MP4
– zip
– gif [1]

10 **(a)** **(i)** 2 marks for 3 correct binary conversions, 1 mark for 2 correct binary conversions [2]

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

(ii) 1 mark for each correct hex value converted

1 A F [3]

(b) 2 marks for working + 1 mark for correct answer

Working
– $1200 \times 8 = 9600$ (bytes)
– 9600/1024 or 9600/1000

Answer
– 9.4 or 9.6 kilobytes [3]

5 **(a)** 112 [1]

(b) 56 [1]

(c) divided by 2 // value 112 was halved // multiplied by 0.5 [1]

(d) **(i)**

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

[1]

(ii) 14 [1]

8

Statement	TRUE or FALSE
MIDI stores the actual music notes in a compressed format	**FALSE**
JPEG files are examples of lossless file compression	**FALSE**
MP3 files are, on average, 90% smaller than the music files stored on a CD	**TRUE**
MP4 files are examples of lossy file compression	**TRUE**

[4]