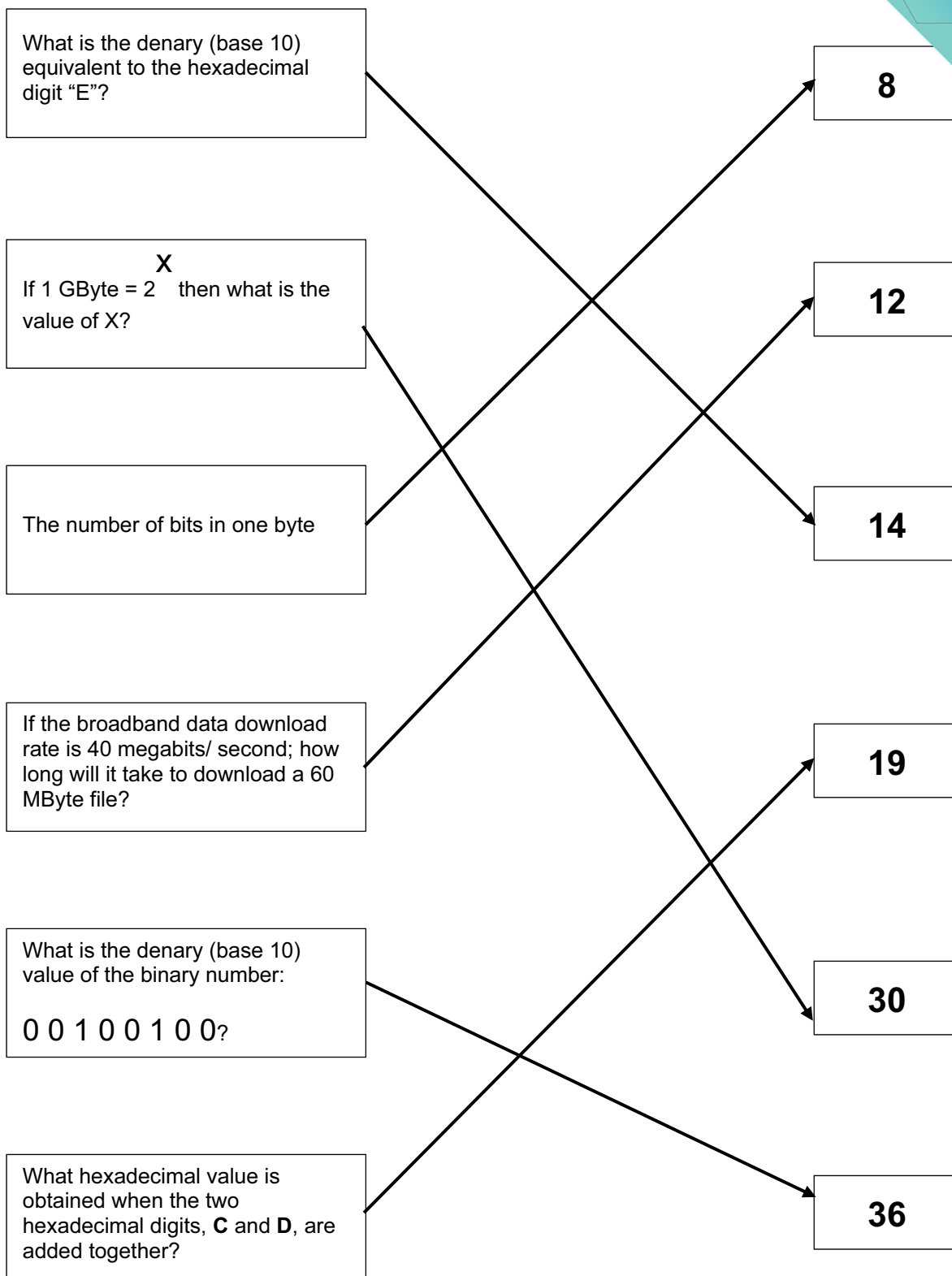


QUESTION 1.

Mark Scheme
Cambridge IGCSE – May/June 2015



9



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



10 1 mark per correctly placed tick

statement	interpreter	compiler
takes one statement at a time and executes it	✓	
generates an error report at the end of translation of the whole program		✓
stops the translation process as soon as the first error is encountered	✓	
slow speed of execution of program loops	✓	
translates the entire program in one go		✓

[5]

QUESTION 2.

Mark Scheme
Cambridge IGCSE – May/June 2016



9 (a)

Binary number A:

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

Binary number B:

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

[2]

(b)

Parity Bit

Binary number A

1

Binary number B

1

[2]

10 1 mark for each correct storage device

ROM (not EPROM/PROM)
Blu-ray disc
RAM
DVD/ DVD-R(+R)/ DVD-RW(+RW)/ DVD-ROM (not CD or DVD-RAM)
SSD/example of a USB <u>storage device</u>
DVD-RAM

[6]

11 1 mark for each correct point

- Presentation is used to format colour/style
- Structure is used to create layout
- In a HTML document structure and presentation are often kept separate
- By keeping the presentation separate it is easier to update colour/font
- Presentation is often stored in a file called a CSS ...
- ... the CSS is then linked to the HTML document to implement the presentation requirements
- (Mark-up) tags are used to define the structure of the document ...
- ... presentation and formatting can also be included within the tags

[4]

QUESTION 3.

PUBLISHED



Question	Answer																									
5(a)	1 mark for correct method, 1 mark for correct answer 32 + 16 + 8 + 1 (00)111001																									
5(b)	registers must have leading zeros, allow follow through from 5(a) for an incorrect value 1 mark for each correct register. <table border="1"><tr><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td></tr></table> <table border="1"><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td></tr></table>	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
0	0	1	1	1	0	0	1																			
0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1											
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
6	1 mark for correct name of code, up to a further 3 marks for appropriate explanation - Quick response (QR) Code Three from: - Barcode is captured / scanned / imaged, by a camera / scanner / barcode reader / QR code reader - Read using a laser - Processed by an app - Light is reflected back - Black squares reflect less light than white squares - Modules are used for orientation / alignment - Squares / data are decoded	4

QUESTION 4.

0478/11

Question	Answer	Marks
1	1 mark for each correct answer, in the given order: – analogue – digital – denary – 10 – binary – 2	6

Question	Answer	Marks
2	1 mark for each correct conversion: – 42 – 257 – 542	3

Question	Answer	Marks
3	1 mark for correct register, 3 marks for reason: – Register C Any three from: – Count the number of 1/0 bits (in each byte/register) – Two bytes/registers have an odd number of 1/0 bits // Two use odd parity – Odd parity must be the parity used – One byte/register has an even number of 1/0 bits // One uses even parity – One with an even number of one bits/even parity is incorrect // Register C should have odd parity	4

Question	Answer	Marks
4(a)	1 mark for each correct answer: Lossy (compression) Lossless (compression)	2
4(b)	1 mark for correct compression, 3 marks for description: – Lossless (compression) Any three from: – The file can be restored/decompressed to the exact same state it was before compression/ to original – (It is a computer program so) no data can be lost // Lossy would remove data – Will not run correctly (with any other compression) – (Lossless) will give repeating words/sections of word a value// RLE is used // Other valid examples of methods of lossless compression – Value is recorded in an index	4

QUESTION 5.

0478/13

Question	Answer	Marks
4(b)(i)	– Multiple bits / byte(s) sent at the same time – Using multiple wires	2
4(b)(ii)	Any one from e.g.: – Integrated Circuits – Any appropriate CPU buses – Any suitable device connection that uses parallel	1
4(b)(iii)	Two from: – Bits remain synchronised ... – ... reducing data errors – Only single wire is required ... – ... more cost effective to install/manufacture	2
4(c)(i)	– Encrypted text is meaningless – Need the key to decrypt the text	2
4(c)(ii)	– Increase length / more bits used for key ... – ... will generate more possibilities for key / less chance of decryption by brute force method	2

Question	Answer	Marks
5(a)	(0)1101011	1
5(b)	000 100101100 1 mark for three leading zeros, 1 mark for correct binary number	2
5(c)	B3 1 mark for each correct character	2
6(a)	Any two from: – A signal sent from a device / software – Requests processor time // Processor stops to service interrupt – Interrupts have different priorities	2

Question	Answer	Marks
6(b)	Any three from e.g.: – Keyboard – Printer – Mouse	3

Question	Answer	Marks
7(a)	Any three from: – Does not require peripherals (mouse or keyboard) – Number of possible inputs limited / menu driven interface – Less chance of input error – Resistant to weather	3
7(b)	– Uses two/multiple layers – When top layer touched / pushed two layers make contact – Circuit is completed when layers touch – Point of contact is determined/calculated	4

QUESTION 6.

0478/12

Question	Answer	Marks
7(a)(i)	– 12 (ignore leading zeros)	1
7(a)(ii)	– 198 (ignore leading zeros)	1
7(a)(iii)	– 1217	1
7(b)	One mark per each correct hex value in correct order – 0E9	3

Question	Answer	Marks
8(a)	Any three from: – It is a universal standard – It can't be inserted the wrong way around – Supports different transmission speeds – Automatically detects if correct driver installed	3
8(b)	Two marks for benefits, one mark for drawback Benefits: – Faster speed of printing – Can print duplex / on both sides – Many letters can be printed from one toner cartridge – Can print in high volumes Drawback – Toner cartridge more expensive to buy – More time to warm-up – Larger footprint	3

QUESTION 7.

0478/13

Question	Answer	Marks
1(a)	– 21 – 258 – 169	3
1(b)	1 mark for each correct hex value – 50 – 3D	4

Question	Answer				Marks																												
2(a)	<table><tr><th>Hardware device</th><th>Input (✓)</th><th>Output (✓)</th><th>Storage (✓)</th></tr><tr><td>Solid state drive (SSD)</td><td></td><td></td><td>✓</td></tr><tr><td>Sensor</td><td>✓</td><td></td><td></td></tr><tr><td>Headphones</td><td></td><td>✓</td><td></td></tr><tr><td>Microphone</td><td>✓</td><td></td><td></td></tr><tr><td>USB flash drive</td><td></td><td></td><td>✓</td></tr><tr><td>Actuator</td><td></td><td>✓</td><td></td></tr></table>				Hardware device	Input (✓)	Output (✓)	Storage (✓)	Solid state drive (SSD)			✓	Sensor	✓			Headphones		✓		Microphone	✓			USB flash drive			✓	Actuator		✓		6
	Hardware device	Input (✓)	Output (✓)	Storage (✓)																													
	Solid state drive (SSD)			✓																													
	Sensor	✓																															
	Headphones		✓																														
	Microphone	✓																															
	USB flash drive			✓																													
	Actuator		✓																														
One mark for each correct tick																																	

QUESTION 8. Mark Scheme

Cambridge IGCSE – October/November 2015



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

- (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]



11 1 mark for each input device + 1 mark for correct MATCHING reason for each device

Input Devices

- Barcode scanner
- ... to scan the barcode on boarding pass/mobile phone screen
- keyboard
- ... to key in data in case barcode fails to scan
- (electronic) scales
- ... weigh luggage at check-in

1 mark for each output device + 1 mark for correct MATCHING reason for each device

Output Devices

- beeper/speaker
- ... confirm barcode read/indicate error if barcode not read
- (LCD) screen
- ... select options (e.g. airline) at check-in
- printer
- ... produce bag labels

[4]

12 (a)

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

[2]

(b) 1 mark for error detection method and 1 mark for description

- Check sum
- ... sum of bits is transmitted and checked against the sum of the received bits
- Check digit
- ... a digit that is calculated (e.g. using modulo-11) and transmitted with the data
- ARQ
- ... when an error is detected in a packet of data a request is automatically sent for the data to be resent

[2]

QUESTION 9.

0478/12

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

Question	Answer	Marks
2	1 mark for each correct category: <i>HDD</i> – Secondary <i>RAM</i> – Primary <i>ROM</i> – Primary <i>CD-ROM</i> – Off-line <i>SSD</i> – Secondary <i>DVD-RAM</i> – Off-line	6

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 <u>for the same value</u>// Denary has less digits <u>for the same value</u>	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

Question	Answer				Marks
4(a)(i)	Method 1	Tick (✓)	Method 2	Tick (✓)	2
	Serial	✓	Simplex		
	Parallel		Half-duplex		
			Duplex	✓	
4(a)(ii)	Any four from (Max 3 for serial): - Serial has <u>less/lower</u> interference - Serial is (more) reliable/accurate <u>over distances</u> - In serial the bits won't be skewed - In serial it is easier to collate the bits together again after transmission - Duplex transmits data in both directions <u>at the same time</u> - simplex/half-duplex/remaining methods won't allow read and write at same time				4

QUESTION 10.

0478/11

Question	Answer	Marks														
2(a)	1 mark for each correct line (to a maximum of 5) <table><thead><tr><th>Binary or hexadecimal</th><th>Denary</th></tr></thead><tbody><tr><td>01001011</td><td>75</td></tr><tr><td>4E</td><td>78</td></tr><tr><td>11011010</td><td>157</td></tr><tr><td>10011101</td><td>167</td></tr><tr><td>A7</td><td>25</td></tr><tr><td>19</td><td>218</td></tr></tbody></table>	Binary or hexadecimal	Denary	01001011	75	4E	78	11011010	157	10011101	167	A7	25	19	218	5
Binary or hexadecimal	Denary															
01001011	75															
4E	78															
11011010	157															
10011101	167															
A7	25															
19	218															
2(b)	Two from: • It makes the values easier to read/write/understand/debug • It is a shorter way to represent the values	2														

Question	Answer	Marks																																													
3(a)	4 marks for 8 correct outputs 3 marks for 6 or 7 correct outputs 2 marks for 4 or 5 correct outputs 1 mark for 2 or 3 correct outputs <table><tr><th>A</th><th>B</th><th>C</th><th>Working space</th><th>X</th></tr><tr><td>0</td><td>0</td><td>0</td><td></td><td>1</td></tr><tr><td>0</td><td>0</td><td>1</td><td></td><td>1</td></tr><tr><td>0</td><td>1</td><td>0</td><td></td><td>1</td></tr><tr><td>0</td><td>1</td><td>1</td><td></td><td>1</td></tr><tr><td>1</td><td>0</td><td>0</td><td></td><td>0</td></tr><tr><td>1</td><td>0</td><td>1</td><td></td><td>1</td></tr><tr><td>1</td><td>1</td><td>0</td><td></td><td>1</td></tr><tr><td>1</td><td>1</td><td>1</td><td></td><td>1</td></tr></table>	A	B	C	Working space	X	0	0	0		1	0	0	1		1	0	1	0		1	0	1	1		1	1	0	0		0	1	0	1		1	1	1	0		1	1	1	1		1	4
A	B	C	Working space	X																																											
0	0	0		1																																											
0	0	1		1																																											
0	1	0		1																																											
0	1	1		1																																											
1	0	0		0																																											
1	0	1		1																																											
1	1	0		1																																											
1	1	1		1																																											
3(b)	Three from: - output of AND is 1 if both inputs are 1 - output of AND is 0 if either or both inputs are 0 - output of OR is 1 if either input is 1 - output of OR is 0 if both inputs are 0 - correct example of AND truth table - correct example of OR truth table	3																																													

Question	Answer	Marks																								
1(a)	1 mark for each correct 8-bit binary number 66 <table><tr><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td></tr></table> 85 <table><tr><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td></tr></table> 83 <table><tr><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td></tr></table>	0	1	0	0	0	0	1	0	0	1	0	1	0	1	0	1	0	1	0	1	0	0	1	1	3
0	1	0	0	0	0	1	0																			
0	1	0	1	0	1	0	1																			
0	1	0	1	0	0	1	1																			
1(b)(i)	1 mark for each correct hexadecimal number 4B 45 59	3																								
1(b)(ii)	Three from: • (HTML) colour codes • Error messages • MAC addresses • IP addresses • Assembly language • Memory dump • Locations in memory	3																								
1(b)(iii)	Two from: • Easier to read/write/understand (for humans) • Easier to remember (for humans) • Short way to represent binary // Uses less screen/display space • Fewer errors made (in data transcription) • Easier to debug (for humans)	2																								

Question	Answer	Marks												
2(a)	1 mark for each correct tick (✓) <table> <tr> <th>Statement</th><th>RAM (✓)</th><th>ROM (✓)</th></tr> <tr> <td>Stores the programs and data that are currently in use</td><td>✓</td><td></td></tr> <tr> <td>Used to boot up the computer when power is turned on</td><td></td><td>✓</td></tr> <tr> <td>Contents are retained when power is turned off</td><td></td><td>✓</td></tr> </table>	Statement	RAM (✓)	ROM (✓)	Stores the programs and data that are currently in use	✓		Used to boot up the computer when power is turned on		✓	Contents are retained when power is turned off		✓	3
Statement	RAM (✓)	ROM (✓)												
Stores the programs and data that are currently in use	✓													
Used to boot up the computer when power is turned on		✓												
Contents are retained when power is turned off		✓												
2(b)	Primary	1												
2(c)	Two from: • Non-volatile storage • Storage that can be disconnected/removed from the computer • Any suitable example • Must be (physically) connected to computer to obtain stored data • Used to store files as a backup	2												

QUESTION 12.

0478/11

Question	Answer	Marks								
2(a)	One mark for each correct denary value <table><tr><th>Binary</th><th>Denary</th></tr><tr><td>0001001110</td><td>78</td></tr><tr><td>0110110111</td><td>439</td></tr><tr><td>1000000001</td><td>513</td></tr></table>	Binary	Denary	0001001110	78	0110110111	439	1000000001	513	3
Binary	Denary									
0001001110	78									
0110110111	439									
1000000001	513									
2(b)	Two from: • Uses fewer characters // shorter • Easier to read / write / understand • Less likely to make mistakes // less error prone • Easier to debug	2								
2(c)	One mark for each correct hexadecimal value in correct order 2 B 5	3								

Question	Answer	Marks
3(a)	Three from: • Malicious software // type of malware • Tracks / records keypresses // keylogger • Sends data to third party • Collected data is analysed to obtain data	3
3(b)	One mark for identified method, one mark for how it prevents spyware: Drop-down boxes // onscreen / virtual keyboard • Means key logger cannot collect data Only requires part of the password • Hacker doesn't get the full password Two-step verification // Two-factor authentication • Extra data is sent to device making it more difficult for hacker to obtain it • Data has to be entered into the same system // if attempted from a remote location, it will not be accepted Use a biometric device • The person's biological data (e.g. their fingerprint) is also required	2
3(c)	Four from: • Monitors traffic coming into and out of the computer system • Checks that the traffic meets any criteria / rules set • Blocks any traffic that does not meet the criteria / rules set • Allows a set blacklist / whitelist // can block certain IP addresses • Can close certain ports	4
3(d)	Two from: • Passwords // biometrics • Levels of access • Proxy servers • Physical security methods – e.g. PC's in locked rooms, etc.	2

Question	Answer	Marks								
4(a)	52	1								
4(b)	<table><tr><td>1</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>	1	1	0	1	0	0	0	0	1
1	1	0	1	0	0	0	0			
4(c)	It is multiplied by 4	1								

Question	Answer	Marks
5(a)	Four from: - A compression algorithm is used - Discards any unnecessary sounds using perceptual musical shaping ... such as removing background noise / sounds humans can't hear // or other suitable example - Reduces sample size / resolution // by example - Reduces sample rate // by example - Sound is clipped - The data is permanently removed	4
5(b)(i)	One from: - The file size will be smaller than lossless - Requires less storage space - Requires less time to transmit	1
5(b)(ii)	One from: - The quality of the sound will be reduced - The original file cannot be restored	1