

AQA Computer Science A-Level
4.5.5 Information coding systems
Past Paper Questions

Additional Specimen AS Paper 2

0 3

The ASCII binary code for character a is 1100001_2

0 3

1 If the ASCII character has been received during a transmission, with the most significant (leftmost) bit being used as a parity bit and the odd parity system in use, explain whether or not the character has been received correctly and how you have determined this.

[2 marks]

0 3

2 A system uses majority voting to send ASCII characters from one device to another. The receiver obtains the following for the transmission of one ASCII character

000 010 011 111 110 000 010 011

Determine the 8 bits that the receiver should use to represent the transmitted ASCII character.

[1 mark]

0 3

The following value is stored in a byte:

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

0 3 . **6** If the byte represents an ASCII character that has been received during a transmission, with the most significant (leftmost) bit being used as a parity bit and the odd parity system in use, explain whether or not the character has been received correctly and how you have determined this.

[2 marks]

0 3 . **7** State **two** reasons why the Unicode character coding system was introduced as an alternative to ASCII.

[2 marks]

Reason 1

Reason 2

June 2016 AS Paper 2

0 2 **Figure 1** contains a bit pattern.

Figure 1

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

0 2 . 5

The ASCII code for the numeric character "0" is 48_{10} ; other numeric characters follow on from this in sequence.

What character is represented by the bit pattern in **Figure 1** if it is an ASCII code?

[1 mark]

0 2 . 6

Parity bits are often used to detect errors during data transmission. If the most significant bit in the bit pattern in **Figure 1** (the leftmost bit) is a parity bit, explain how the value of this was calculated by the sending device before the byte was transmitted. You should assume that the even parity system is being used.

[2 marks]

0 2 . 7

Majority voting is an alternative to using parity bits. Explain how the majority voting system works in the context of data transmission.

[2 marks]

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0 2 . 5

Figure 3 is a 7-bit ASCII character to be transmitted across a network. The system uses odd parity with the parity bit being transmitted in the MSB (Most Significant Bit).

Calculate the parity bit and write it in the empty cell in **Figure 3**.

[1 mark]

Figure 3

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

0 2 . 6

When transmitting data across a network some systems use majority voting rather than a parity bit.

State **one** advantage of using majority voting over a parity bit **and** explain how this advantage is achieved.

[2 marks]

June 2012 Comp 1

The ASCII system uses 7 bits to represent a character. The ASCII code in denary for the numeric character '0' is 48; other numeric characters follow on from this in sequence.

0 2

Using 7 bits, express the ASCII code for the character '2' in binary.

(1 mark)

Characters are transmitted using an 8-bit code that includes a single parity bit in the most significant bit. A parity bit is added for error checking during data transmission.

0 3

Using odd parity, what 8-bit code is sent for the numeric character '0'?

(2 marks)

June 2013 Comp 1

1 0

State **one** difference between Unicode and ASCII.

(1 mark)

7-bit ASCII codes are often transmitted using 8 bits, with a single parity bit added in the most significant bit to help with error detection.

1 1

Explain how the even parity system works. Include a description of the roles of the sending device and the receiving device during transmission.

(4 marks)

Specimen AS Paper 2

0 3 . The ASCII binary code for character a is 1100001_2

0 3 . **1** Explain what is mean by a character code.

[1 mark]

0 3 . **2** Complete **Table 1** to show how the word be would be encoded in the binary form of ASCII.

[2 marks]

Table 1

Character	Binary form of ASCII
b	
e	

A program has been developed to convert a string so that all of its characters are in upper case.

The computer does this by taking each character's ASCII binary code and applying a bitwise AND operation to it, using the mask 1011111_2 .

0 3 . **3** Convert the lower case character c, ASCII code 1100011_2 , into the upper case character C using the method described above.

[1 mark]

Specimen Paper 2

Each packet of data transmitted around the LAN includes a checksum, which is used for error detection.

0	7
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4

 Describe how the checksum is used for error detection.

[3 marks]
