

5 A website allows users to purchase items.

Computer A sends a request for the homepage to the website's server.

(a) The request is sent using packet switching.

The structure of a packet of data has three elements. One element is the packet header.

(i) Identify **two** items of data contained in a packet header.

- 1
- 2 [2]

(ii) Identify the **two** other elements of a packet.

- 1
- 2 [2]

(b) Computer A needs to be directly connected to a router that is located in a different room.

(i) Tick (✓) **one** box to identify whether serial data transmission or parallel data transmission is more suitable for this connection.

Explain the reasons for your choice.

Serial data transmission

Parallel data transmission

Reasons for your choice

.....

.....

.....

..... [3]

(ii) The connection will also use full-duplex data transmission.

Define full-duplex data transmission.

.....

.....

..... [2]

(c) The data transmission will use parity checks.

(i) The bytes need to be sent using an even parity byte check.

Complete the parity bit for each byte.

	Parity bit							
Byte A		1	1	0	0	0	1	1
Byte B		0	0	0	0	0	0	0

[2]

(ii) A parity block check can be used instead of a parity byte check.

Explain how a parity block check might detect an error in transmission that would **not** be detected by a parity byte check.

.....

.....

..... [2]

(iii) The data was sent using an even parity block check. One of the bits has been transmitted incorrectly.

	Parity bit	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7
Byte 0	1	1	1	0	1	0	0	0
Byte 1	0	0	1	0	0	1	0	0
Byte 2	1	0	1	1	0	0	0	1
Byte 3	1	1	0	0	1	1	1	1
Byte 4	1	0	1	0	0	0	1	0
Byte 5	0	0	0	0	0	0	0	0
Byte 6	0	1	1	1	1	0	0	0
Parity byte	0	1	1	0	1	0	1	0

Identify the bit number and the byte number of the incorrect bit.

Bit number

Byte number

[2]

(d) The website allows the user to set up an account to log on and purchase items. The website is accessed and displayed using a web browser.

(i) Two functions of the web browser are to render hypertext markup language (HTML) to display web pages and to store cookies.

Identify **two** other functions of a web browser.

- 1
- 2 [2]

(ii) Identify **two** ways that cookies can be used to enhance the user's experience of this website.

- 1
- 2 [2]