QUESTION 1.

5 Parity checks are often used to check for errors that may occur during data transf

(a) A system uses **even parity**.

Tick (✓) to show whether the following three bytes have been transmitted correc
incorrectly.

Received byte	Byte transmitted correctly	Byte transmitted incorrectly
1 1 0 0 1 0 0 0		
0 1 1 1 1 1 0 0		
0 1 1 0 1 0 0 1		

[3]

(b) A parity byte is used to identify which bit has been transmitted incorrectly in a block of data.

The word "F L O W C H A R T" was transmitted using nine bytes of data (one byte per character). A tenth byte, the parity byte, was also transmitted.

The following block of data shows all ten bytes received after transmission. The system uses **even parity** and column 1 is the parity bit.

	letter	column 1	column 2	column 3	column 4	column 5	column 6	column 7	column 8
byte 1	F	1	0	1	0	0	1	1	0
byte 2	L	1	0	1	0	1	1	0	0
byte 3	O	1	0	1	0	1	1	1	1
byte 4	W	1	0	1	1	0	1	1	1
byte 5	C	1	0	1	0	0	0	1	1
byte 6	H	0	0	1	0	1	0	0	0
byte 7	A	0	0	1	0	0	1	0	1
byte 8	R	1	0	1	1	0	0	1	0
byte 9	T	1	0	1	1	0	1	0	0
parity byte		1	0	1	1	1	1	1	0

(i) **One** of the bits has been transmitted incorrectly.

Write the byte number and column number of this bit:

Byte number .....

Column number .....

[2]

(ii) Explain how you arrived at your answer for **part (b)(i)**.

.....

.....

.....

.....[2]

(c) Give the denary (base 10) value of the byte: **1 0 1 1 1 1 1 0**

.....

.....[1]

(d) A parity check may not identify that a bit has been transmitted incorrectly.

Describe **one** situation in which this could occur.

.....

.....

.....[1]

QUESTION 2.

4 **(a)** Nikita wishes to print out some documents and connects her printer to the one of the USB ports.

(i) Identify what type of data transmission is being used.

.....

(ii) Give **three** reasons for using a USB port.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(iii) The printer runs out of paper while it is printing the documents. A signal is sent to the processor to request that the problem is dealt with.

Name this type of signal.

.....[1]

(b) State **one** suitable application for **each** printer below. A different application must be given for each printer.

Inkjet printer .....

.....

3D printer .....

.....

[2]

(c) Name another type of printer and describe **one** way in which it is different named in **part (b)**.

Give an application for this printer.

Type of printer .....

Description .....

.....

.....

Application .....

.....

[3]

QUESTION 3.

5 **(a)** Parity checks are often used to detect errors that may occur during data tra

The received bytes in the table below were transmitted using **odd parity**.

Tick (✓) to show whether each byte has been **corrupted during transmission** o
corrupted during transmission.

Received byte	corrupted during transmission (✓)	not corrupted during transmission (✓)
10110100		
01101101		
10000001		

[3]

(b) Another method of error detection is Automatic Repeat reQuest (ARQ).

Explain how ARQ is used in error detection.

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..... [4]

QUESTION 4.

7 Computer A is communicating with computer B.

(a) Draw an arrow or arrows to show simplex, duplex and half-duplex data transmi… **direction** of the data transmission must be fully **labelled**.

Simplex data transmission

Computer **A**

Computer **B**

Duplex data transmission

Computer **A**

Computer **B**

Half-duplex data transmission

Computer **A**

Computer **B**

[6]

(b) State a use for the following data transmission methods. The use must be different for each data transmission method.

Simplex .....

.....

Duplex .....

.....

[2]

(c) A computer includes an Integrated Circuit (IC) and a Universal Serial Bus transmission.

Describe how the computer uses these for data transmission, including the type transmission used.

IC .....

.....

.....

.....

USB .....

.....

.....

.....

[4]

QUESTION 5.

10 RockICT is a music business that has a website to allow customers to view and [illegible] it sells.

The website consists of web pages.

(a) Describe what is meant by HTML structure and presentation for a web page.

.....

.....

.....

.....

.....

.....

.....

.....[4]

(b) The URL for the music company's website is:

https://www.rockict.net/index.htm

Part 1 **Part 2**

(i) Identify what **Part 1** and **Part 2** represent in this URL.

Part 1 .....

Part 2 .....
[2]

(ii) Describe what is meant by **https**.

.....

.....

.....

.....[2]

(c) When a customer enters the website, a message is displayed:

"RockICT makes use of cookies. By continuing to browse you are agreeing to cookies."

Explain why the music company uses cookies.

.....

.....

.....

.....

[2]

(d) The music company is concerned about the security of its website.

The company uses a proxy server as part of its security system.

Describe the role of a proxy server in the security system.

.....

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[4]

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QUESTION 6.

4 A company transmits data to external storage at the end of each day.

(a) Parity checks can be used to check for errors during data transmission.

The system uses **odd parity**.

(i) Tick (✓) to show for each of the received bytes whether they have been **transmitted correctly** or **transmitted incorrectly**.

Received byte	Transmitted correctly (✓)	Transmitted incorrectly (✓)
10001011		
10101110		
01011101		
00100101		

[4]

(ii) State **one** other method that could be used to check for transmission errors.

..... [1]

(b) Data can be transferred using parallel or serial data transmission.

(i) Describe what is meant by parallel data transmission.

.....

.....

.....

..... [2]

(ii) Give **one** application of parallel data transmission.

.....

..... [1]

(iii) Explain why serial data transmission is normally used for transferring d
distance.

.....

.....

.....

..... [2]

(c) Data transferred over a network is encrypted to improve data security.

The system uses 64-bit symmetric encryption.

(i) Explain how encryption improves data security.

.....

.....

.....

..... [2]

(ii) Explain **one** method that could be used to increase the level of security provided by the encryption.

.....

.....

.....

..... [2]

QUESTION 7.

8 Leonard has a new laser printer to print letters for his business.

Leonard connects his printer to his computer using the USB port.

(a) Give **three** benefits of using the USB port to connect the printer to the computer.

Benefit 1 .....

.....

Benefit 2 .....

.....

Benefit 3 .....

.....

[3]

(b) State **two** benefits and **one** drawback of Leonard using a laser printer, instead of an inkjet printer, to print the letters.

Benefit 1 .....

.....

Benefit 2 .....

.....

Drawback .....

.....

[3]

(c) An interrupt signal is sent from the printer to the computer.

(i) Give **two** examples of when a printer would generate an interrupt signal.

Example 1 .....

Example 2 .....

[2]

(ii) Many devices send interrupt signals.

Identify the software in the computer that will receive and manage all interrupt signals.

..... [1]

QUESTION 8.

9 Four 7-bit binary values are being transmitted from one computer to another. An
is being used to check for errors in the binary values.

Write the correct **Parity bit** for each **7-bit binary value** to make sure it meets **odd** parity.

Parity bit	**7-bit binary value**
.....	0000011
.....	1000000
.....	0111111
.....	1010101

[4]

10 Clive has a laptop computer that he uses for his business. He enters a username and password to log in to his laptop.

Clive is worried about spyware being used to find out his username and password.

(a) Describe how spyware could be used to find out Clive's username and password.

.....

.....

.....

.....

.....

.....

.....

..... [4]

(b) The threat of spyware makes Clive concerned about typing a password to log in to his laptop.

Give an example of how Clive could log in securely without typing a password.

..... [1]

QUESTION 9.

8 **Four** descriptions about compilers and interpreters are shown below.

Draw lines to indicate which descriptions refer to a compiler and which descriptions interpreter.

Description	
It is more difficult to debug the code since one error can produce many other associated errors.	
The speed of execution of program loops is slower.	Compiler
It produces fast, executable code that runs directly on the processor.	Interpreter
It is easier to debug the code since an error is displayed as soon as it is found.	

[4]

QUESTION 10.

4 A file server is used as a central data store for a network of computers.

Rory sends data from his computer to a file server that is approximately 100 metres av

It is important that the data is transmitted accurately. Rory needs to be able to read data fro
write data to the file server at the same time.

(a) (i) Use ticks (✓) to identify the most suitable data transmission methods for this application.

Method 1	Tick (✓)	**Method 2**	Tick (✓)
Serial		Simplex	
Parallel		Half-duplex	
		Duplex	

[2]

(ii) Explain why your answer to **part (a)(i)** is the most suitable data transmission.

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.....

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.....[4]

(b) Identify and describe **two** methods of error checking that can be used to ma
data stored after transmission is accurate.

Method 1 .....

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.....

.....

.....

.....

.....

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Method 2 .....

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[6]

QUESTION 11.

8 Kamil correctly answers an examination question about a number of internet term

Six different terms have been removed from Kamil's answer.

Complete the sentences in Kamil's answer, using the list given. Not all terms in the list need used.

- browser
- connection
- domain name server (DNS)
- Internet
- Internet Service Provider (ISP)
- IP address
- MAC address
- network
- protocol
- uniform resource locator (URL)
- webpages
- hypertext mark-up language (HTML)

A ..... is a program that allows a user to view ..... .

An ..... is a company that provides a connection to access the ..... .

The main ..... that governs the transmission of data using the Internet is http.

The ..... is provided by the network, and given to each device on the network.

[6]

QUESTION 12.

9 **(a)** Computers can transmit data using different methods.

Describe the **three** data transmission methods given.

(i) Serial data transmission

.....

.....

.....

.....[2]

(ii) Parallel data transmission

.....

.....

.....

.....[2]

(iii) Duplex data transmission

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.....

.....

.....[2]

(b) Data can sometimes be corrupted when it is transmitted from one comp
causing errors to be present in the data.

Identify and describe **three** methods of error detection that could be used to see i
has occurred.

Error detection method 1 .....

Description .....

.....

.....

.....

Error detection method 2 .....

Description .....

.....

.....

.....

Error detection method 3 .....

Description.....

.....

.....

.....

[9]

QUESTION 13.

4 The MAC address of a device is represented using hexadecimal.

A section of a MAC address is shown. Each pair of hexadecimal digits is stored using e

(a) Complete the table to show the 8-bit binary equivalents for the section of MAC addres first number has already been converted.

6A	FF	08	93
01101010			

[3]

(b) Explain why data is stored as binary in computers.

.....

.....

.....

.....[2]

5 Data can be transferred using half-duplex serial transmission.

(a) Describe serial transmission.

.....

.....

.....

.....[2]

(b) Give **one** application of serial data transmission.

.....

.....[1]

(c) Describe half-duplex data transmission.

.....

.....

.....

.....[2]

5 Sonia shares files with her friends. The method of data transmission she uses is
transmission.

(a) Describe how data is transmitted using half-duplex serial data transmission.

.....

.....

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.....

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..... [4]

(b) The system uses parity bits to check for errors during data transmission.

The outcome of four bytes after transmission is:

Byte 1	Byte 2	Byte 3	Byte 4
00110011	01010100	10110100	01110111

One of the bytes has been transmitted incorrectly.

Identify the byte that was transmitted incorrectly.

Byte .....

Explain how you identified the byte that was transmitted incorrectly.

.....

.....

.....

.....

[4]

10 Data is valuable to a company.

(a) Companies use error detection methods to make sure that data is accurate.

One error detection method is the use of a check digit.

Explain what is meant by a check digit and how it is used to detect errors.

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..... [4]

(b) Companies can use a range of security methods to keep their data secure.

Identify **two** security methods that a company can use to keep their data secure **and** explain how each method can keep the data secure.

Security method 1 .....

.....

.....

.....

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.....

Security method 2 .....

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.....

.....

.....

[6]

5 The contents of three binary registers have been transmitted from one computer to another. **parity** has been used as an error detection method.

The outcome after transmission is:

- **Register A** and **Register B** have been transmitted **correctly**.
- **Register C** has been transmitted **incorrectly**.

Write the appropriate **Parity bit** for each register to show the given outcome.

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

[3]

6 Jesse is taking his Computer Science examination. He answers **five** questions about ethics.

(a) For the first question, he writes the answer:

"This type of software can be copied and shared without the permission of the owner."

State what Jesse is describing.

..... [1]

(b) For the second question, he writes the answer:

"With this type of software, the owner still retains the copyright for the software, but he gives away copies of it for free."

State what Jesse is describing.

..... [1]

(c) For the third question, he writes the answer:

"This type of software is often a trial version of the full software. To use the full version the user normally needs to pay a fee."

State what Jesse is describing.

..... [1]