Past-paper walk-through

Text, sound and images ▪ 1.2

eXercise

Questions in this set

- 0478/11 N25 Q3 ▪ 11 marks
- 0478/13 N25 Q5 ▪ 7 marks
- 0478/11 J25 Q3 ▪ 4 marks
- 0478/12 J25 Q2 ▪ 9 marks
- 0478/13 J25 Q1 ▪ 12 marks
- 0478/12 M25 Q2 ▪ 17 marks
- 0478/11 N24 Q3 ▪ 11 marks
- 0478/11 N23 Q5 ▪ 14 marks
- 0478/12 N23 Q5 ▪ 5 marks
- 0478/12 J23 Q3 ▪ 10 marks

Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- // separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = "or words to that effect" – the wording need not match.

Question 3

0478/11 N25 ▪ Q3 ▪ 11 marks

A student has a portable device. He uses an on-screen keyboard to write messages to his friend.

(a) Explain how the text the student writes is converted to binary to be processed. **[3]**

Question 3

0478/11 N25 ▪ Q3 ▪ 11 marks

A student has a portable device. He uses an on-screen keyboard to write messages to his friend.

(b)(i) State the amount of RAM the device has in mebibytes (MiB). **[1]**

(b)(ii) State the amount of RAM the device has in tebibytes (TiB). Your answer can be given rounded to 3 decimal places. **[1]**

Question 3

0478/11 N25 ▪ Q3 ▪ 11 marks

A student has a portable device. He uses an on-screen keyboard to write messages to his friend.

(c) Explain why the portable device needs RAM. **[3]**

Question 3

0478/11 N25 ▪ Q3 ▪ 11 marks

A student has a portable device. He uses an on-screen keyboard to write messages to his friend.

(d) The device has a fingerprint scanner to allow the student to unlock the portable device.

Circle only **three** terms that can be used to describe the fingerprint scanner.

- authentication
- biometric
- malware
- parity check
- firewall
- input device

Question 3

- output device
- storage device

[3]

Solution 3

(a)

Mark scheme

- Any three from:
- ▪ A character set is used
- ▪ ... such as ASCII/Unicode
- ▪ Each character has a unique binary value that it is converted to

Solution 3

(b)(i)

Mark scheme

- 4096

(b)(ii)

Mark scheme

- 0.004 // 0.0039(0625)

Solution 3

(c)

Mark scheme

- Any three from:
- ▪ To store data/instructions that are currently in use
- ▪ To store software/programs that are currently in use
- ▪ For volatile storage // to store data temporarily
- ▪ To allow data to be accessed directly by the CPU/processor // To allow data to be stored closer to the
- CPU/processor

Solution 3

(d)

Mark scheme

- Authentication
- Biometric
- Input device

Question 5

0478/13 N25 ▪ Q5 ▪ 7 marks

Text, images and sound are represented as binary to be processed by a computer.

(a) Complete the table by writing the missing terms and descriptions about representing text, images and sound as binary.

Term	**Description**
character set	
	This is the number of samples taken each second when recording sound.
pixel	
resolution	
	This is the number of bits used to represent a colour in an image.

Question 5

[5]

Question 5

Term	Description
character set	....
.....	This is the number of samples taken each second when recording sound.
pixel	....
	.....

Question 5

resolution	....
.....	This is the number of bits used to represent a colour in an image.

[5]

Question 5

0478/13 N25 ▪ Q5 ▪ 7 marks

Text, images and sound are represented as binary to be processed by a computer.

(b) The size of an image file is 1000 bytes.

Give the size of the image file in bits. **[1]**

Question 5

0478/13 N25 ▪ Q5 ▪ 7 marks

Text, images and sound are represented as binary to be processed by a computer.

(c) The size of a sound file is 4096 mebibytes (MiB).

Give the size of the file in gibibytes (GiB). **[1]**

Solution 5

(a) Worked steps

One mark for each correct term or description, so read the completed rows first: they show exactly how much detail earns a mark.
The vocabulary the table draws on:

Text

- **Character set** — stores all the characters and their unique binary values.
- **ASCII** — 7 or 8 bits per character, enough for 128 or 256 characters.
- **Unicode** — more bits per character, enough for the characters of every language.

Sound

- **Sampling** — measuring the amplitude of the analogue wave at regular intervals.
- **Sample rate** — how many samples are taken each second.

Solution 5

- **Sample resolution** — the number of bits used to store each sample.

Images

- **Pixel** — the smallest component of an image.
- **Resolution** — the number of pixels, as width $\times$ height.
- **Colour depth** — the number of bits used to store each pixel's colour.

Two pairs are routinely swapped, and both are worth fixing in your mind by what they measure:

- **Sample rate** is *how often*; **sample resolution** is *how finely*.
- **Resolution** counts pixels; **colour depth** counts bits per pixel.

Solution 5

Write descriptions in the same shape as the ones already printed. A description that merely renames the term — "colour depth is the depth of the colour" — earns nothing. **Mark scheme**

- One mark for each correct term or description
- Term
- Description character set
- This stores all the characters and their unique binary values sample rate
- This is the number of samples taken each second when recording sound.
- pixel

Solution 5

- This is the smallest unit/part of an image resolution
- This is the number of pixels that appear in an image/displayed on a screen // The number of pixels high by the number of pixels wide // the bit rate and sample rate of sound colour depth // bit depth
- This is the number of bits used to represent a colour in an image.

Solution 5

(b)

Mark scheme

- 8000 (bits)

Solution 5

(c)

Mark scheme

- 4 (GiB)
- 1
- October/November
- 2025

Question 3

0478/11 J25 ▪ Q3 ▪ 4 marks

An image is converted to binary to be represented by a computer.
Complete the table with the missing terms and definition about representing an image.

Term	**Definition**
	This is the smallest component of an image.
resolution	
	This is the number of bits used to create each colour in an image.
	This is additional data that is stored with an image that can provide information such as the time and date the image was taken.

Question 3

[4]

Question 3

Term	Definition
.....	This is the smallest component of an image.
resolution	....
.....	This is the number of bits used to create each colour in an image.
.....	This is additional data that is stored with an image that can provide information such as the time and date the image was taken.

[4]

Solution 3

Worked steps

One mark for each correct term or definition. The completed row shows the expected level of detail — match it.

The three terms this table is built from:

- **Pixel** — the smallest component of an image.
- **Image resolution** — the number of pixels in the image, given as width $\times$ height.
- **Colour depth** — the number of **bits** used to store the colour of each pixel.

Solution 3

Worked steps

The relationship between them is worth stating to yourself, because it is what the next question in this style always asks: **file size = width × height × colour depth**, which is why doubling either the resolution or the colour depth doubles the file.
The confusion to avoid is between **resolution** and **colour depth**. Resolution counts pixels; colour depth counts bits inside one pixel. A definition mentioning "the number of colours" belongs to colour depth — and specifically, n bits give 2^n colours.
A definition has to say something the term does not. "Resolution is how detailed the image is" is true and scores nothing; "the number of pixels, width by height" is the definition. **Mark scheme**

- One mark for each correct term or definition.

Solution 3

Worked steps

- Term
- Definition pixel
- It is the smallest component of an image.
- resolution
- The number of pixels high by the number of pixels wide // The number of pixels in an image colour depth // bit depth
- This is the number of bits that are used to create each colour in an image.
- metadata // header
- This is additional data that is stored with an image that can provide information such as the time and date the image was taken.

Question 2

0478/12 J25 ▪ Q2 ▪ 9 marks

A student has an image file stored on their computer.

(a) The image file was taken by a digital camera.

Tick (✓) **one** box to show whether a digital camera is an example of an input, output, process or storage device. **[1]**

- **A** input
- **B** output
- **C** process
- **D** storage

Question 2

0478/12 J25 ▪ Q2 ▪ 9 marks

A student has an image file stored on their computer.

(b)(i) Give the size of the image file in kibibytes (KiB). **[1]**

(b)(ii) State the number of nibbles in 1 byte. **[1]**

Question 2

0478/12 J25 ▪ Q2 ▪ 9 marks

A student has an image file stored on their computer.

(c)(i) State what is meant by a colour depth of 32 bits. **[1]**

(c)(ii) The colour depth of the image file is changed to 64 bits.
Explain what effect this change has on the image file. **[2]**

Question 2

0478/12 J25 ▪ Q2 ▪ 9 marks

A student has an image file stored on their computer.

(d) The student uses lossless compression to compress the image file.
Explain how the image file is compressed using lossless compression. **[3]**

Solution 2

A input ✓

B output

C process

D storage

Answer: **A**

Question 1

0478/13 J25 ▪ Q1 ▪ 12 marks

A student records himself singing a song for his music project. The recorded sound is converted to binary to be processed by a computer.

(a) Give **one** input device the student can use to record the song. **[1]**

Question 1

Term	Description
.....	This is the measurement of the height (amplitude) of a sound wave taken at regular time intervals.
sample rate	....
sample resolution	....

[3]

Question 1

0478/13 J25 ▪ Q1 ▪ 12 marks

A student records himself singing a song for his music project. The recorded sound is converted to binary to be processed by a computer.

(b) The student uses sound editing software to edit the recorded sound.

Tick (✓) **one** box to show whether sound editing software is an example of application, security, system or utility software. **[1]**

- **A** application software
- **B** security software
- **C** system software
- **D** utility software

Question 1

0478/13 J25 ▪ Q1 ▪ 12 marks

A student records himself singing a song for his music project. The recorded sound is converted to binary to be processed by a computer.

(c)(i) Convert the **two** binary numbers to denary numbers.

00011001 10110100 **[2]**

(c)(ii) Convert the **two** binary numbers to hexadecimal numbers.

00011001 10110100 **[2]**

(c)(iii) A logical right shift of two places is performed on the binary number 10100100. Give the binary number that would be stored after the logical shift has taken place. **[1]**

Question 1

0478/13 J25 ▪ Q1 ▪ 12 marks

A student records himself singing a song for his music project. The recorded sound is converted to binary to be processed by a computer.

(d) The two's complement 8-bit binary integer 11001001 is also stored.

Convert the two's complement 8-bit binary integer to denary. Show all of your working. **[2]**

Question 1

0478/13 J25 ▪ Q1 ▪ 12 marks

A student records himself singing a song for his music project. The recorded sound is converted to binary to be processed by a computer.

(e) The table contains terms and descriptions about the process of converting analogue sound to binary. Complete the table with the missing term and descriptions.

Term	Description
	This is the measurement of the height (amplitude) of a sound wave taken at regular time intervals.
sample rate	
sample resolution	

Question 1

[3]

Solution 1

(a)

Mark scheme

- Microphone

Solution 1

(b)

Mark scheme

- A

Solution 1

(c)(i) **Worked steps**

Write the place values above the bits — **128 64 32 16 8 4 2 1** — and add the ones.

- 0001 1001 $= 16 + 8 + 1 =$ **25**
- 1011 0100 $= 128 + 32 + 16 + 4 =$ **180**

Solution 1

Note the second answer is 180, not a negative number: these are **plain** binary integers, not two's complement. Only part (d) says two's complement, and only then does the leading bit carry a negative place value.

Mark scheme

- 25
- 180

Solution 1

(c)(ii) Worked steps

Group the bits in **fours from the right** and convert each nibble, using the weights 8 4 2 1 inside it.

- 0001 1001 $\rightarrow$ 0001 = 1, 1001 = 9 $\rightarrow$ **19**
- 1011 0100 $\rightarrow$ 1011 = 11 = B, 0100 = 4 $\rightarrow$ **B4**

Solution 1

Do not go through denary. Hex and binary line up nibble to digit because $16 = 2^4$, so this is a lookup, not a calculation — and going via denary is where 180 becomes B4 incorrectly.

Mark scheme

- 19
- B4

Solution 1

(c)(iii)

Mark scheme

- 00101001

Solution 1

(d) Worked steps

The leading bit is 1, so `1100 1001` is negative. **Flip and add one**:

1. Invert: `0011 0110`
2. Add one: `0011 0111`
3. Read it: $32 + 16 + 4 + 2 + 1 = \mathbf{55}$
4. Restore the sign: $\mathbf{-55}$

Two marks — one for the **method** and one for the **answer** — so the flip and the add-one both belong on the page.

Solution 1

The check that catches a slip: add your answer's stored form to the positive form and the eight bits should come out zero, with the carry falling off the end.

Mark scheme

- One mark for correct method of working e.g. flip and add 1
- One mark for correct answer
- -55

Solution 1

(e) **Worked steps**

Each row of the table is a **term and its description**, and one mark is given for each missing cell — so read the row that is complete to see the level of detail expected. The vocabulary of analogue-to-digital sound conversion:

- **Sampling** — measuring the amplitude of the analogue wave at regular intervals.
- **Sample rate** — how many samples are taken per second, measured in hertz.
- **Sample resolution** — the number of bits used to store each sample.
- **Analogue-to-digital converter (ADC)** — the hardware that performs the conversion.

Solution 1

The two that are confused with each other are **rate** and **resolution**: rate is *how often*, resolution is *how finely*. Both increase the file size and both improve accuracy, but they are different measurements and a description mentioning "bits per second" belongs to neither. **Mark scheme**

- One mark for each correct missing term or definition.
- Term
- Description
- (sound) sampling/sample
- This is the measurement of the height (amplitude) of a sound wave at regular time intervals.

Solution 1

- sample rate
- The number of samples recorded each second sample resolution
- The number of bits that are used to record each sample

Question 2

0478/12 M25 ▪ Q2 ▪ 17 marks

An artist creates an image on a computer.

(a) State what is meant by the colour depth of an image. **[1]**

Question 2

0478/12 M25 ▪ Q2 ▪ 17 marks

An artist creates an image on a computer.

(b) Describe the relationship between the resolution of the image and the file size of the image. **[2]**

Question 2

0478/12 M25 ▪ Q2 ▪ 17 marks

An artist creates an image on a computer.

(c)(i) Explain the reasons why the artist chose lossless compression instead of lossy compression to compress this image file. **[3]**

(c)(ii) Identify one lossless method of compressing an image.

Describe your chosen method.

Description **[3]**

Question 2

0478/12 M25 ▪ Q2 ▪ 17 marks

An artist creates an image on a computer.

(d)(i) Explain how a file is broken down into packets and transmitted over a network. **[5]**

(d)(ii) The packets can use many different methods of data transmission to travel.

Complete and annotate the diagram to show the difference between serial full-duplex transmission between two computers and parallel simplex transmission between two computers.

Serial full-duplex transmission:

Computer 1	Computer 2

Question 2

Parallel simplex transmission:

Computer 1	Computer 2

[3]

Solution 2

(a)

Mark scheme

- Any one from:
- ▪ Number of bits used to represent each/a/one colour
- ▪ Number of colours that can be represented

Solution 2

(b)

Mark scheme

- Any two from:
- ▪ The higher the resolution the more pixels
- ▪ The higher the resolution the more bits to store
- ▪ The higher the resolution the larger the file size

Solution 2

(c)(i) Mark scheme

- Any three from:
- Examples:
- ▪ Lossless will retain all parts of the image // lossless does not delete any data // The artist does not want any of the image to be lost when downloaded
- ▪ Lossy will reduce the quality
- ▪ ... because the artist wants to provide the detailed image
- ▪ Image may be small in file size anyway
- ▪ ... server has enough space to store the image

Solution 2

- ... download time is not excessive

Solution 2

(c)(ii)

Mark scheme

- 1 mark for naming, max 2 for describing, for example:
- ▪ Run-length encoding
- ▪ Repeating pixels of one colour are identified // patterns are identified
- ▪ ... and indexed // put into a table // assigned a value
- ▪ ... as the number of repetitions and the colour code

Solution 2

(d)(i) Mark scheme

- Max 5 overall
- Any three from:
- ▪ Data is split into fixed size packets
- ▪ The data is the payload
- ▪ Each packet is given a header
- ▪ ... example of header data e.g. Destination IP, packet number, hop number
- ▪ Each packet has a trailer
- ▪ ... example of trailer data e.g. error checking method

Solution 2

- Any three from:
- ▪ Router directs each packet towards its destination
- ▪ Routes selects the most efficient path
- ▪ Each packet can take a different path
- ▪ Packets can arrive out of order
- ▪ ... after the last packet has arrived, they are reordered

Solution 2

(d)(ii)

Mark scheme

- The completed diagram showing:
- ▪ Parallel simplex having multiple wires and serial having one wire
- ▪ Serial full-duplex going both ways at the same time
- ▪ Parallel simplex only going one way
- For example:

Question 3

0478/11 N24 ▪ Q3 ▪ 11 marks

A user enters text into a computer system, using a keyboard.
An American standard code for information interchange (ASCII) character set is used to convert the text to binary.

(a) Identify **one** other character set that could be used to convert the text to binary.**[1]**

Question 3

0478/11 N24 ▪ Q3 ▪ 11 marks

A user enters text into a computer system, using a keyboard.

An American standard code for information interchange (ASCII) character set is used to convert the text to binary.

(b)(i) Convert the **two** denary ASCII numbers to binary.

65 109 **[2]**

(b)(ii) Convert the **two** denary ASCII numbers to hexadecimal.

65 109 **[2]**

Question 3

0478/11 N24 ▪ Q3 ▪ 11 marks

A user enters text into a computer system, using a keyboard.

An American standard code for information interchange (ASCII) character set is used to convert the text to binary.

(c)(i) Convert the binary ASCII number to denary. **[1]**

(c)(ii) Convert the binary ASCII number to hexadecimal. **[1]**

(c)(iii) A logical right shift of two places is performed on the binary ASCII number 01111001.

Give the binary number after the logical right shift of **two** places is performed. **[1]**

Question 3

0478/11 N24 ▪ Q3 ▪ 11 marks

A user enters text into a computer system, using a keyboard.

An American standard code for information interchange (ASCII) character set is used to convert the text to binary.

(d) The character 'T' is represented by the binary ASCII number 01010100.

The character 't' is represented by the binary ASCII number 01110100.

Add the **two** binary numbers using binary addition. Give your answer in binary. Show all your working. **[3]**

Solution 3

(a)

Worked steps

- **Unicode**

ASCII was named in the question, so the other character set the syllabus wants is Unicode. Its distinguishing feature, if a reason is wanted: it uses more bits per character — 8, 16 or 32 — so it can represent the characters of every language, where ASCII covers 128 or 256.

Mark scheme

- Unicode

Solution 3

(b)(i)

Worked steps

Denary to binary by subtracting place values — 128, 64, 32, 16, 8, 4, 2, 1.

- $65 = 64 + 1 = 0100\ \ 0001$
- $109 = 64 + 32 + 8 + 4 + 1 = 0110\ \ 1101$

Keep them **eight bits wide**, padding with leading zeros: ASCII is stored in a byte, so 1000001 is the right value in the wrong format.

Mark scheme

- ▪ (0)1000001
- ▪ (0)1101101

Solution 3

(b)(ii)

Worked steps

Take the binary from part (b)(i) and group it in fours — do not convert from denary again.

- `0100 0001` → 4, `1` → **`41`**
- `0110 1101` → 6, `D` → **`6D`**

`1101` is $8 + 4 + 1 = 13 =$ **D**. Reusing the binary you already have is both quicker and safer than a second conversion from denary.

Mark scheme

- 41
- 6D

Solution 3

(c)(i)

Worked steps

Add the place values of the 1 bits — **128 64 32 16 8 4 2 1** written above the digits.

For this character the answer is **121**.

The check that costs one line: convert the same binary to hexadecimal as well (part (c)(ii)) and confirm the two agree — $7 \times 16 + 9 = 121$. ✓ Any disagreement means one of the two conversions slipped, and you will know which by re-reading the nibbles.

Mark scheme

- 121

Solution 3

(c)(ii)

Worked steps

Split the eight bits into **two nibbles** and convert each, using the weights 8 4 2 1 inside a nibble.

For this character the answer is **79**.

Do **not** go via denary. Hex and binary line up nibble to digit because $16 = 2^4$, so this is a lookup rather than a calculation — and the denary detour is where the errors come from.

Mark scheme

- 79

Solution 3

(c)(iii)

Mark scheme

- 00011110

Solution 3

(d) Worked steps

Add the two ASCII codes column by column from the right, carrying at 2.
Three marks: **one for the working** — the carries written in — and **one for each correct nibble**.
Write the carries in their own row above the columns, and keep the digits aligned vertically. The working mark does not depend on the answer being right, so it is the one to secure first.

Solution 3

Check by converting both codes to denary, adding there, and comparing with your binary total. 'T' is 84 and 't' is 116, so the sum should be 200 — and 200 needs eight bits exactly, so watch whether a ninth appears.

Mark scheme

- One mark for correct working, for example: carries
- One mark for each correct nibble.
- 1 1 1 1
- 0 1 0 1 0 1 0 0
- 0 1 1 1 0 1 0 0
- 1 1 0 0 1 0 0 0

Question 5

0478/11 N23 ▪ Q5 ▪ 14 marks

5 A musician is recording herself playing the music for a song on the piano.

(a) Explain how the analogue sound is recorded and converted to digital.

Question 5

(b) State **two** ways that the accuracy of the recording could be increased.

Question 5

[2]

(c) The musician compresses the sound file using lossless compression instead of lossy compression.

Explain why the musician would choose to use lossless compression instead of lossy compression.

Question 5

(d) The musician types the words for the song into a document.

Two character sets that can be used when converting text to digital are the American standard code for information interchange (ASCII) and Unicode.

Explain the differences between the ASCII character set and the Unicode character set.

Solution 5

(a) Mark scheme

- Any five from:
- –
- (The analogue sound is) recorded using a microphone
- –
- The sound wave is sampled
- –
- ... measuring the height/amplitude
- –

Solution 5

- Each amplitude has a unique binary value
- —
- The sample rate is set
- —
- ... that is the number of samples taken per second
- —
- The sample resolution is set
- —
- ... that is the number of bits used for each sample
- —

Solution 5

- Each sample taken is converted to binary
- 5

Solution 5

(b)

Mark scheme

- Two from:
- –
- Increase the sample rate
- –
- Increase the sample resolution
- 2

Solution 5

(c) Mark scheme

- Any three from:
- –
- They want to be able to edit the original sound file
- –
- They want the highest sound quality for the file // They want the sound to be closest to the original recording
- –
- ... using lossy would reduce the sound quality

Solution 5

- —
- ... using lossy will permanently remove some of the data // no data will be permanently removed with lossless
- 3

Solution 5

(d) Mark scheme

- Any four from (MAX 3 for ASCII/Unicode alone):
- –
- ASCII has limited/fewer characters // Unicode has a more characters
- –
- ASCII covers a limited set of languages/fewer languages
- –
- Unicode includes many/more languages/emojis
- –

Solution 5

- ASCII requires 7/8 bits per character
- –
- Unicode requires up to 16/32 bits per character
- –
- ASCII has 128/256 characters
- –
- Unicode has 65 536/4 294 967 296 characters // approx. 60/70 thousand/4 billion characters
- 4
- 0478/11

Solution 5

- October/November 2023

Question 5

0478/12 N23 ▪ Q5 ▪ 5 marks

5 A band is recording their new song. They need to consider the sample rate and sample resolution of their recording.

(a) Give **one** benefit of using a higher sample rate to record the song.

Question 5

(b) Give **one** drawback of using a higher sample rate to record the song.

Question 5

(c) Describe what is meant by sample resolution.

Question 5

(d) The band wants to compress the sound file, but they do **not** want any data to be permanently removed.

Identify the compression method that should be used.

Solution 5

(a)

Mark scheme

- Any one from:
- –
- The recording of the song is more accurate/closer to original
- 1

Solution 5

(b)

Mark scheme

- Any one from:
- –
- The file size will be increased
- –
- The file will require more storage space
- 1

Solution 5

(c) Mark scheme

- Any two from:
- –
- The number of bits that are used per sample
- –
- ... that provides the variation in amplitude that can be stored for each
- sample // defines the number of different amplitudes that can be recorded
- –
- ... that determines how quiet/loud the sounds are that can be recorded

Solution 5

- —
- Example e.g. 16-bit
- 2

Solution 5

(d)

Mark scheme

- —
- Lossless
- 1
- 0478/12
- October/November
- 2023

Question 3

0478/12 J23 ▪ Q3 ▪ 10 marks

3 When keys are pressed on a keyboard, the text is converted to binary to be processed by the computer.

(a) Describe how the text is converted to binary to be processed by the computer.

Question 3

(b) Text that is input into a computer can be stored in a text file.

A text file can be compressed using lossless compression.

(i) State what effect this has on the file size.

Question 3

(ii) Describe how lossless compression compresses the text file.

Question 3

(iii) Give **two** reasons why the text file may have been compressed.

Question 3

[2]

Solution 3

(a) Mark scheme

- Any three from:
- ▪
- A character set is used
- ▪
- ... such as Unicode/ASCII
- ▪
- Each character has a unique binary value
- 3

Solution 3

(b)(i)

Mark scheme

- ▪
- It reduces the file size
- 1

Solution 3

(b)(ii) Mark scheme

- Any four from:
- ▪
- A compression algorithm is used
- ▪
- ... such as RLE/run length encoding
- ▪
- Repeating words/characters/phrases are identified // Patterns are identified
- ▪

Solution 3

- ... and indexed
- ▪
- ... with number of occurrences
- ▪
- ... with their position
- 4

Solution 3

(b)(iii) Mark scheme

- Any two from:
- e.g.
- ▪
- To save storage space
- ▪
- To make it quicker to transmit
- ▪
- To make it small enough to attach to an email

Solution 3

- ▪
- To reduce the bandwidth needed to transmit
- 2