

1(a)	1 mark for each correctly connected change box, max 3 marks
1(b)	1 mark per bullet point, max 2 marks • Each character has a unique code • Each character in the text is replaced sequentially / in order by its code
1(c)	1 mark per bullet point, max 2 marks • ASCII uses 7 / 8 bits Unicode can use many more / up to 32 bits • Unicode can represent a wider range of characters including different languages

7(a)	1 mark per point, max 2 marks e.g. • The learning experience could be improved • ... by identifying students who are struggling • and employing more personalised learning • There could be early Intervention • ... to determine which students require extra support • Teachers and students could understand the challenges better • ...and identify optimal times for learning • There could be privacy concerns • students / teachers could be uncomfortable with constant surveillance • ... students might not want their data / actions passed to third parties • There could be Mental Health concerns • due to constant monitoring and pressure • contributing to student stress and anxiety
7(b)	1 mark for the working 1 mark for the correct answer Working: $(4000 \times 3000 \times 30 \times 16) / (8 \times 1000 \times 1000 \times 1000)$ $/// (4000 \times 3000 \times 30 \times 2) / (1000 \times 1000 \times 1000)$ Answer: 0.72 gigabytes
7(c)	1 mark for the name 2 marks for the matching description, max 3 marks • Parity Byte Check • a parity bit is added to each byte to make the number of 1s match the parity, odd or even • each byte can be checked on receipt and request to be resent if the byte does not match parity • Parity Block Check • a bit is added to each byte, but a parity byte is also set for each block • the location of an error can be found using vertical and horizontal parity • Checksum • A calculation is made from the data and transmitted with the data • The receiver performs the same calculation and compares with received checksum to see if they match

3(a)	1 mark for each correct answer <table border="1"> <thead> <tr> <th data-bbox="368 152 983 219">Statement</th><th data-bbox="983 152 1318 219">Answer</th></tr> </thead> <tbody> <tr> <td data-bbox="368 219 983 315">The term for the smallest element that makes up an image.</td><td data-bbox="983 219 1318 315">pixel</td></tr> <tr> <td data-bbox="368 315 983 412">The largest number of different colours that can be represented with a bit depth of 8 bits.</td><td data-bbox="983 315 1318 412">256 // 2⁸</td></tr> <tr> <td data-bbox="368 412 983 508">The term for the dots per inch (dpi) when an image is displayed.</td><td data-bbox="983 412 1318 508">Screen resolution</td></tr> </tbody> </table>	Statement	Answer	The term for the smallest element that makes up an image.	pixel	The largest number of different colours that can be represented with a bit depth of 8 bits.	256 // 2⁸	The term for the dots per inch (dpi) when an image is displayed.	Screen resolution
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3(b)(i)	1 mark each to max 2 • A wider range of characters can be represented • so characters from more languages can be represented • and symbols such as emojis can be used								
3(b)(ii)	1 mark for: 10,094								
3(b)(iii)	1 mark for: 8,512								

1(a)(i)	1 mark for correct working: e.g. $2000000 * 16 / (8 * 1000 * 1000)$ 1 mark for answer: 4MB																
1(a)(ii)	1 mark each Image: - There will be fewer shades of colour available - so the image does not match the original as detail is lost Image file: - Fewer bits are used to store each pixel - so less data is stored, therefore the file size is reduced																
1(b)	1 mark for each correct term: <table><tr><th>Description</th><th>Sound term</th></tr><tr><td>the number of times the amplitude is measured per time interval</td><td>Sampling rate</td></tr><tr><td>the number of bits used to store each amplitude measurement</td><td>Sampling resolution</td></tr><tr><td>the type of sound wave before it is recorded by a computer</td><td>Analogue</td></tr></table>	Description	Sound term	the number of times the amplitude is measured per time interval	Sampling rate	the number of bits used to store each amplitude measurement	Sampling resolution	the type of sound wave before it is recorded by a computer	Analogue								
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1(c)(i)	1 mark each to max 2 8 / 16 / 32 / bits per character - Represents $2^8 / 2^{16}$ / etc. characters - Represents every language and other characters such as emojis																
1(c)(ii)	1 mark for each correctly completed space <table><tr><th>Character</th><th>Denary</th><th>8–bit Binary</th><th>Hexadecimal</th></tr><tr><td>!</td><td>33</td><td>0010 0001</td><td>21</td></tr><tr><td>L</td><td>76</td><td>0100 1100</td><td>4C</td></tr><tr><td>ü</td><td>252</td><td>1111 1100</td><td>FC</td></tr></table>	Character	Denary	8–bit Binary	Hexadecimal	!	33	0010 0001	21	L	76	0100 1100	4C	ü	252	1111 1100	FC
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7(a)(i)	1 mark for each correct definition Colour depth: - the number of bits used to represent a colour // the number of colours that can be represented in an image File header: - stores data about the image file / metadata
7(a)(ii)	1 mark for each correct explanation Image quality: - Decreasing resolution means details within the image are lost because there are fewer pixels // Increasing resolution means the image is more detailed because there are more pixels File size: - Decreasing the resolution will decrease the file size because there are fewer pixels therefore less data // Increasing the resolution will increase the file size because there are more pixels therefore more data
7(a)(iii)	1 mark for correct method For example: Run-Length Encoding
7(b)	1 mark for each correct definition Property: - an attribute of a drawing object // data about a shape // defines one aspect of the appearance of a drawing object Drawing list: - all the drawing objects/shapes in an image // stores the commands/descriptions / mathematical equations required to draw each object

2(d)(i)	1 mark each: - Image is made of pixels and each pixel has one colour - Each colour has a unique binary code Code for the colour of each pixel is stored in sequence
2(d)(ii)	1 mark each to max 2: - List of objects in the drawing - A list that stores the command/description/equation required to draw each object - Properties of each object e.g. the fill colour, line weight/colour

2(d)(iii)	1 mark each to max 2: • Dedicated connection to the headset // not sharing bandwidth • Already fast connection that can transmit the data without slowing • Video may already be a small file size and does not need further reduction • Video is not saved so storage is not an issue in the headset
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