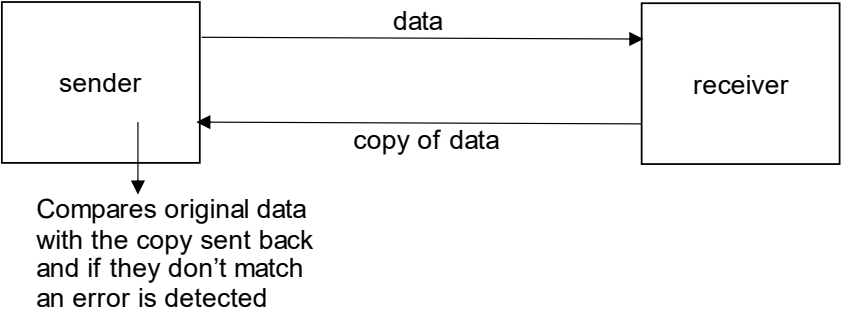


2(a)	Any two from: - Resolution // number of pixels - Colour depth // bit depth - Quality // detail - Metadata
2(b)(i)	Router
2(b)(ii)	(Packet) header
2(c)	Any three from: - It has 128 bits - Hexadecimal - Separated by colons 8 groups of digits - Each group is 4 digits - Consecutive groups of 0s can be represented by :: once
2(d)	Any three from: The diagram shows: (Data being sent to the receiver) and a copy sent back from the receiver to the sender - Sending device comparing the original data and the copy - If original data and copy don't match an error is detected  <pre> graph LR S[sender] -- data --> R[receiver] R -- copy of data --> S S --> C[Compares original data with the copy sent back and if they don't match an error is detected] </pre>
2(e)(i)	C
2(e)(ii)	Asymmetric

1(a)	D
1(b)	2048
1(c)(i)	(Data) Compression
1(c)(ii)	Any one from: - Less bandwidth required to transmit the file - Less storage space needed to store the file - To meet email file size limit - To use less data allowance

1(a)	B
1(b)	One mark for correct example. Two marks for matching explanation. • RAM • To store data/instruction that is 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 • ROM • To store the BIOS • To store the bootstrap/bootloader • To store start-up instructions • To store the firmware • For non-volatile storage // to store data permanently • To store data/instructions that should not change (unless needed) • Cache • To store frequently used instructions/data • For volatile storage // to store data temporarily
1(c)(i)	One mark for valid working, for example: $128 + 32 + 8 + 4 + 2 + 1$ One mark for correct answer: 10101111
1(c)(ii)	• 0001 0101 • 0010 1101 • 0000 1001 0001
1(d)	One mark for each correct nibble. One mark for method of working, for example: carries. One mark for identification of overflow. $ \begin{array}{r} 1 \\ 11100011 \\ + 11001100 \\ \hline 1 \quad 10101111 \end{array} $
1(e)	One mark for correct working, for example: flip and add One mark for correct denary. –114

2(a)	The file size will be reduced
2(b)	Any two from: • It will be under the file size limit for the email • It will be uploaded/transmitted/downloaded faster • It will take less storage space (on computer) • It will use less data allowance (if mobile data used) • Requires less bandwidth
2(c)	Any three from: • Data will be permanently removed • ... and that could be important/necessary data • (The report will have text in it and) lossy is not suitable for text files • ... as it will damage/corrupt the file • The report may have images in it and the quality of these will be reduced
2(d)(i)	Character set
2(d)(ii)	Any two from: • It can represent more characters • It can represent emojis/symbols • It can represent more languages
2(d)(iii)	Each character requires more storage space
2(e)(i)	• originator's address • destination address • packet number
2(e)(ii)	C
2(e)(iii)	Router
2(f)(i)	• A copy of the data is sent back to the employee's device/sender • The employee's device/sender compares the data sent to the data received back • If the original and the copy do not match, an error has occurred
2(f)(ii)	Any two from: • The checksum is calculated from/using the data • ... using the same algorithm • ... so, if the values are different the data must be different
2(g)(i)	Any one from: • To keep it secure • The data is sensitive/confidential • To make it meaningless

2(g)(ii)	Any one from: • They both use a key • They both scramble the data // both make the data meaningless • They both turn plain text into cypher text
2(g)(iii)	Any two from: • Symmetric uses <u>one/public</u> key whereas asymmetric uses <u>two/public and private</u> keys • Symmetric can send the key with the data whereas asymmetric does not • Symmetric decrypts the data using the same key whereas asymmetric decrypts the data using a different key • Symmetric is less secure than asymmetric

1(a)	8
1(b)	2048
1(c)	nibble

2(a)	One mark for each correct definition: • The sample rate is the number of samples taken in a second/per time unit • The sample resolution is the number of bits per sample
2(b)	• Lossy compression
2(c)(i)	Any two from: e.g. • Destination/receivers (IP) address • Packet number • Originator's/senders (IP) address
2(c)(ii)	Any five from: • Data is broken/split/divided into packets • Each packet (could) take a different route • A router controls the route/path a packet takes • ... selecting the shortest/fastest available route/path • Packets may arrive out of order • Once the last packet has arrived, packets are reordered • If a packet is missing/corrupted, it is requested again

3(a)	One mark each: 8 bytes = 16 nibbles 512 KiB = 0.5 MiB 4 GiB = 4096 MiB 1 EiB = 1024 PiB
3(b)	Any three from: • Currently running data • Currently running (application) software • Currently running instructions • Currently running parts of OS • Currently running utility software
3(c)	Any two from: • For non-volatile/permanent/long-term storage of files/data • To store data that is not currently required by the CPU • To store data to transfer it to another computer