Unit 4: Exchanging Data
(4a. Compression, Encryption and Hashing, AS Content)

Marks: /13

Answer **all** the questions.

1. The website of a school allows visitors to download JPG, MP3, MPEG and PDF files.

   The video clip is compressed using lossy compression.

   Explain why lossy compression is suitable for a video clip, but not suitable for a text document.

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   [3]

2. Two types of compression are lossy and lossless.

State which type of compression is most appropriate for each of the following and explain why it is appropriate.

(i) Downloading the source code of a large program

Type of compression ----------

Explanation ----------

---[3]

(ii) Streaming a large video file

Type of compression ----------

Explanation ----------

---[3]

3. Kofi uses his computer to record an audio file of himself playing his guitar.

He emails his recording to a record label. He uses lossy compression to produce the music file.

Explain **two** reasons why using lossy compression is beneficial.

1

2

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[4]

END OF QUESTION PAPER

Question			Answer/Indicative content	Marks	Guidance
1			• When the file is compressed some detail / data / quality / resolution is lost… • … which is not noticeable in the video file / video still viewable with lower quality • … but would make the text file unreadable / lose meaning or comprehension	3	*The first bullet is for the idea that something is lost in the compression process.* *The second bullet is for the idea that the video file is still usable with this loss.* *The third bullet is for the idea that the text file is not usable.*
			Total	3	
2		i	• Lossless compression • The code has to be exactly as it was originally written • … or else it will not work.	3	Explanation must follow from the type of compression given. ?Examiner's Comments?? Middle ability candidates were largely able to show their understanding of lossless and lossy compression by identifying which was to be used in the scenarios given, and stronger candidates were able to also justify why. It was pleasing to see significantly better performance on this topic than in previous sessions, suggesting that centres have heeded to the advice given in previous reports.
		ii	• Lossy compression • Achieves higher compression / smaller file size / faster streaming than lossless • Video can still be viewed at lower quality (from the data compressed).	3	?Examiner's Comments ?? When candidates were justifying the use of lossy compression for the large video, most stated the fact that the loss of detail was relatively inconsequential but only the most able candidates went on to add that in addition it provides better compression ratios than lossless to give a full justification.
			Total	6	
3			Lossy means the decompressed file is not identical to the original… …the difference is unlikely to be noticed by humans Lossy will decrease the file size … … so it can be sent via e-mail	2	1 mark for each bullet. (1 mark for identification of the effect, one mark for an explanation)
			Total	4	

Note on exam paper:
All of these questions come from GCSE papers, the level of knowledge for this section is the same at AS & GCSE.