

Data Representation

1.2 Text, sound and images

- 1** A student has a sound file that is too large to be stored on their external secondary storage device. The student compresses the sound file to make the file size smaller.

The compression method used reduces the sample rate and the sample resolution of the sound file.

- (a) State what is meant by the sample rate and sample resolution.

Sample rate

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Sample resolution

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[2]

- (b) Identify which type of compression has been used to compress the sound file.

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..... [1]

- 2** 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.

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..... [3]

- 3 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.

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..... [5]

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

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2 [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.

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..... [3]

- (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.

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- 4 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.

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

..... [1]

- (c) Describe what is meant by sample resolution.

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..... [2]

- (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.

..... [1]

- 5 A photographer takes an image with a digital camera. The photographer sets the resolution and colour depth for the image.

- (a) State what is meant by the image resolution.

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..... [1]

- (b) State what is meant by the image colour depth.

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..... [1]

- (c) Give **one** benefit of increasing the colour depth of the image.

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..... [1]

- (d) The photographer compresses the image using a method that permanently reduces the colour depth and resolution of the image.

Identify which compression method the photographer uses.

..... [1]

- (e) One benefit for compressing the image is to reduce the storage space it uses.

Give **two** other benefits of compressing the image.

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[2]

- 6** An image has a 16-bit colour depth and a resolution of 1000×1750 pixels.

- (a) State what is meant by a 16-bit colour depth.

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..... [1]

- (b) The resolution of the image is changed to 750×1500 pixels.

Give the effect this will have on the file size of the image.

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..... [1]