Data Representation

1.2 Text, sound and images

Marking Scheme

1

Question	Answer	Marks
(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	**1**

2

Question	Answer	Marks
(a)	Any **three** from: • A character set is used • … such as Unicode/ASCII • Each character has a **unique binary** value	**3**

3

Question	Answer	Marks
(a)	Any **five** from: – (The analogue sound is) recorded using a microphone – The sound wave is sampled – … measuring the height/amplitude – 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 – Each sample taken is converted to binary	**5**
(b)	**Two** from: – Increase the sample rate – Increase the sample resolution	**2**
(c)	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 – … using lossy will permanently remove some of the data // no data will be permanently removed with lossless	**3**
(d)	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 – 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**

4

Question	Answer	Marks
(a)	Any **one** from: – The recording of the song is more accurate/closer to original	1
(b)	Any **one** from: – The file size will be increased – The file will require more **storage** space	1
(c)	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 – Example e.g. 16-bit	2
(d)	– Lossless	1

5

Question	Answer	Marks
(a)	– The dimensions of an image // Number of pixels wide by number of pixels high	1
(b)	– The number of bits used to represent each/a colour	1
(c)	Any **one** from: – A greater range of colours can be seen/used – Image will be closer to the actual content of the image/real life – The image will have more detail	1
(d)	– Lossy	1
(e)	Any **two** from: – Quicker to transmit/upload/download – Not as much bandwidth needed to transmit file – To fit in limitation of file size on e.g. email	2

6

Question	Answer	Marks
(a)	16 bits used to represent **each** colour in the image	1
(b)	The file size will decrease	1