MODULE C DATA REPRESENTATION · C10

Representing sound: mark scheme

20 marks · Cambridge 0478 syllabus 1.2.2

How to use. One mark per creditworthy point up to the maximum shown. **/** separates alternative words; **//** separates alternative answers. Words in (brackets) are not needed for the mark. Cambridge 0478 uses "sample resolution"; accept "bit depth". Accept "quality" for accuracy.

QUESTION	ANSWER	MARKS	GUIDANCE
1(a) 0478 1.2.2	The number of samples taken in a second	**1**	Accept per second. Do not accept the frequency of the sound wave.
1(b) 0478 1.2.2	The number of bits per sample // used to store each sample	**1**	Accept bit depth. Do not accept number of bits in the file.
2(a) 0478 1.2.2	True False True False	**4**	1 mark per row, in this order. Two ticks in a row = 0 for that row.
3(a) 0478 1.2.2	32	**1**	Working: $2^5 = 32$. Do not accept 25 or 10.
3(b) 0478 1.2.2	More bits per sample so more (different) values/levels can be stored // each sample is closer to the actual amplitude/height of the wave	**1**	16 bits gives $2^{16} = 65{,}536$ values against 32.
4(a) 0478 1.2.2	Sample rate increased: more accurate, file size increases Sample resolution decreased: less accurate, file size decreases Sample resolution increased: more accurate, file size increases Sample rate decreased: less accurate, file size decreases	**4**	1 mark per row; both ticks must be correct.

QUESTION	ANSWER	MARKS	GUIDANCE
5(a) 0478 1.2.2	Any five from: sound (wave) is analogue the sound wave is sampled the amplitude/height of the wave is measured at set/regular time intervals each sample is converted to / stored in binary sample rate is the number of samples taken per second a higher sample rate gives a more accurate recording // larger file sample resolution is the number of bits per sample a higher sample resolution gives a more accurate recording // larger file	**5**	max 5. Credit each effect once for sample rate and once for sample resolution. Accept "closer to the original sound" for more accurate. Do not credit "the frequency is measured".
6(a) 0478 1.2.2	Reduce the sample rate // reduce the sample resolution	**1**	Must state the direction. Do not accept compression.
6(b) 0478 1.2.2	The tracks will be less accurate // lower quality // sound less like the original	**1**	Must follow from the change in (a).
6(c) 0478 1.2.2	The length / duration of the track	**1**	Accept number of seconds. File-size calculations (syllabus 1.3.2) are practised in B8.

Total: 20 marks