01 Table 1 shows four stages in converting sound into a digital form.

Show the correct order for the stages by labelling them with the numbers 1– 4 (1 being the first stage).

[3 marks]

Table 1

Stage	Order (1 – 4)
binary representation of level stored	4
microphone picks up sound waves	1
value read at specific point and rounded to a level	3
converted to an electrical analogue signal	2

1 correct = 1 mark; 2 correct = 2 marks; all correct = 3 marks

02.1 A sound engineer is recording a singer.

The engineer is using a sampling rate of 4000 Hz and a sample resolution of 4 bits. What is the minimum file size of a 7 second recording? Your answer should be given in bytes.
You should show your working.

[4 marks]

Remember: this is a non-calculator paper

4000 x 4 = 16,000 [1 for multiplying by 4 or 4000 – even if incorrect]

16,000 x 7 = 112,000 bits [1 for multiplying by 7 – even if incorrect]

112,000 / 8 = 14,000 [1 for dividing by 8 – even if incorrect]

Answer: 14,000 – accept 14kB

02.2 The sound engineer currently uses a sample resolution of 4 bits which enables a sample to be stored as one of 16 different bit patterns. She wants to increase the number of bit patterns available from 16 to 32. Shade one lozenge which shows the minimum sample resolution (in bits) she can choose that will allow her to do this..

[1 mark]

5 bits – this question is about binary numbers. You can represent 16 binary numbers (0-15) with 4 bits; to be able to represent 32 numbers you need 5 bits – 0 to 31.