0 1   A sound engineer is recording a singer.

0 1 . 1   Describe why the sound must be converted to a digital format before it can be stored on a computer system.

[2 marks]

_____

_____

_____

_____

0 1 . 2   The sound engineer is using a sampling rate of 2000 Hz and a sample resolution of 4 bits. What is the minimum file size of a 5 second recording? Your answer should be given in **bytes**.

You should show your working.

[4 marks]

_____

_____

_____

_____

_____

_____

Answer: _____

0 1 . 3 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]

A 3 bits ⬭

B 5 bits ⬭

C 8 bits ⬭

D 16 bits ⬭

0 1 . 4 Shade **one** lozenge to show which of the following correctly states the effects of increasing the sampling rate.

[1 mark]

A Decreases both the quality of the recording and the file size ⬭

B Has no effect on the quality of the recording or the file size ⬭

C Improves the quality of the recording and has no effect on file size ⬭

D Improves the quality of the recording and increases the file size ⬭

Turn over for the next question

0 2 . 1   The size of a sound file is calculated using the following formula:

size (in bits) = sampling rate * sample resolution * seconds

To calculate the size **in bytes**, the number is divided by **8**

The algorithm in **Figure 12**, represented using pseudo-code, should output the size of a sound file in **bytes** that has been sampled 100 times per second, with a sample resolution of 16 bits and a recording length of 60 seconds.

A subroutine called `getSize` has been developed as part of the algorithm.

Complete **Figure 12** by filling in the gaps using the items in **Figure 11**.

You will not need to use all the items in **Figure 11**.

[6 marks]

Figure 11

bit	byte	getSize	OUTPUT
rate	res	RETURN	sampRate
seconds	size	size + 8	size * 8
size / 8	size MOD 8	SUBROUTINE	USERINPUT

Figure 12

```
SUBROUTINE getSize(_____, _____, seconds)

         _____ ← sampRate * res * seconds

     size ← _____

         _____ size

ENDSUBROUTINE


OUTPUT  _____(100, 16, 60)
```

0 3 . 1 Explain how a sound wave is converted so that it can be stored in a computer.

[3 marks]

_____

_____

_____

_____

_____

0 3 . 2 A student has recorded a 30 second digital sound track using a sample rate of 44 000Hz. 8 bits have been used to store each sample taken.

Calculate the file size **in kilobytes** of the digital sound track.

You should show your working.

[2 marks]

_____

_____

_____

Answer _____ kB

0 4   Analogue sound must be converted to a digital form for storage and processing in a computer.

0 4 . 1   Define the term **sample resolution**.

[1 mark]

0 4 . 2   State **one** disadvantage of a high sample resolution.

[1 mark]

0 4 . 3   A 50-second sound has been recorded at a sample rate of 40 000 Hz.
Two bytes have been used to store each sample of the sound.

Calculate the file size of the sound file in **megabytes**.

Show your working.

[2 marks]

Answer_____megabytes

Turn over for the next question

0 5 . 1 When a sound wave is converted to a digital form it is sampled. The sampling rate is measured in hertz (Hz).

Define the term **hertz**.

[1 mark]

_____

_____

0 5 . 2 A sampling rate of 20 000 Hz and a sample resolution of four bits is used to make a digital recording of a sound that lasts 50 seconds.

What is the minimum file size of the recording in megabytes (MB)?

You should show your working.

[3 marks]

_____

_____

_____

_____

_____

Answer _____ MB

0 6   A sound engineer is recording a singer.

0 6 . 1   Describe why the sound must be converted to a digital format before it can be stored on a computer system.

[2 marks]

0 6 . 2   The sound engineer is using a sampling rate of 2000 Hz and a sample resolution of 4 bits. What is the minimum file size of a 5-second recording? Your answer should be given in **bytes**.

You should show your working.

[4 marks]

0 6 . 3 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]

A   3 bits   ⬭

B   5 bits   ⬭

C   8 bits   ⬭

D   16 bits   ⬭

0 6 . 4 Shade **one** lozenge to show which of the following correctly states the effects of increasing the sampling rate.

[1 mark]

A   Decreases both the quality of the recording and the file size   ⬭

B   Has no effect on the quality of the recording or the file size   ⬭

C   Improves the quality of the recording and has no effect on the file size   ⬭

D   Improves the quality of the recording and increases the file size   ⬭