

Please check the examination details below before entering your candidate information

Candidate surname				Other names			
Centre Number				Candidate Number			

Pearson Edexcel Level 3 GCE

Wednesday 4 June 2025

Morning (Time: 2 hours 15 minutes plus 10 minutes setting up time)

Paper reference **9MT0/41**

Music Technology

Advanced

COMPONENT 4: Producing and Analysing

You must have: Pearson audio/MIDI files, headphones or monitor speakers, digital audio workstation (DAW) and MIDI keyboard.

Total Marks

Setting up time

- Open a new project in your DAW using 16 bit/44.1 kHz sample rate.
- Save the project as '**comp4_your candidate number**' (e.g. **comp4_1234**) in the folder designated by your centre.
- Set the metronome to **80 bpm**.
- Import 'bass.wav' to a new track in your DAW, aligned with the beginning of bar 1.
- Ensure that the bass guitar is audible and plays in time with the metronome. The bass guitar begins bar 2, beat 1.
- You must not open the paper until instructed to do so by the invigilator.

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- Save your audio files for Questions 1, 2, 3 and 5 within the 2 hours 15 minutes examination time.
- You must ensure that the left and right earpieces of your headphones are worn correctly.
- Access to a calculator or calculator software is not permitted.
- Access to the internet or local network is not permitted.

Information

- The total mark for this paper is 105.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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SECTION A

Answer ALL questions. Write your answers in the spaces provided.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Question 1 is about the bass guitar and acoustic guitar parts.

1 Listen to the bass guitar part you have imported.

(a) (i) Identify how the bass guitar was captured.

(1)

- ☐ A Ambient microphone
- ☐ B Close microphone
- ☐ C DI
- ☐ D MIDI

(ii) Give **two** characteristics of the bass guitar that support your answer in part (a)(i).

(2)

1

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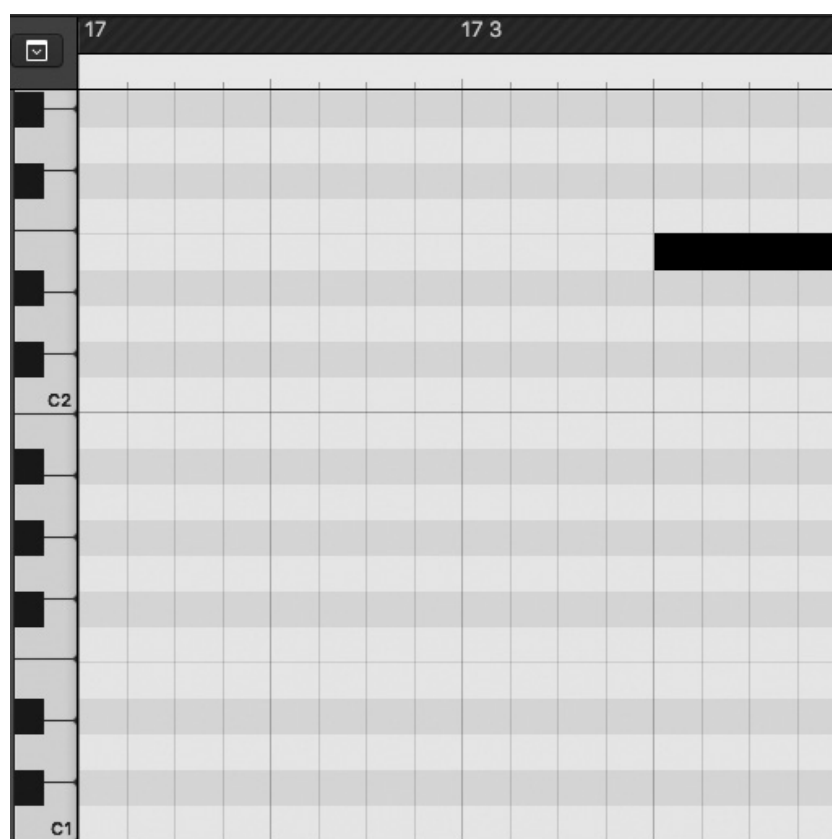
2

.....



- (b) Draw the missing notes of the bass guitar part for bar 17 on the piano roll editor below.

(2)



- (c) Import 'acoustic guitar mic.wav' to a new track in your DAW. The beginning of this audio track should be aligned with the start of bar 1. The acoustic guitar begins just before the start of bar 2.

In bar 17, the guitarist played a wrong chord. Correct the performance mistake in bar 17. The roots of the chords are given in the bass guitar part.

(5)

Bounce/export the completed acoustic guitar part as a single 16 bit/44.1 kHz stereo .wav file to the designated folder on your computer.

Name it 'q1_ your candidate number' (e.g. q1_1234).

- (d) Import 'acoustic guitar DI.wav' to a new track in your DAW. The beginning of this audio track should be aligned with the start of bar 1. The acoustic guitar begins at the start of bar 2.

The file is bars 1–13. You should not use this audio in your final mix.

Compare the microphone signal with the DI signal.

(4)

(Total for Question 1 = 14 marks)



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QUESTION 2 BEGINS ON THE NEXT PAGE.



Question 2 is about the drum part.

2 Import the MIDI file 'drums.mid' to a new track in your DAW. Align the part so that the drums begin playing at the start of bar 2.

- (a) Complete the table below to give the velocity in decimal and in binary of the highest and lowest velocity values in bar 2.

	Velocity in decimal	Velocity in binary
Highest velocity	(1)	(1)
Lowest velocity	(1)	(1)

- (b) The notes in the MIDI file have been assigned to the incorrect sounds. Using an acoustic drum kit, assign the notes to the sounds listed below to form a folk style drum part. You must not change the rhythm.

- Kick drum
- Snare
- Closed hi-hat in bars 2–13 and 22–25
- Ride cymbal in bars 14–21
- High tom
- Mid tom
- Crash cymbal

(7)

Bounce/export the completed drum part as a single 16 bit/44.1 kHz stereo .wav file to the designated folder on your computer.

Name it 'q2_ your candidate number' (e.g. q2_1234).

(Total for Question 2 = 11 marks)



Question 3 is about the synth part.

3 Import the MIDI file 'synth.mid' to a new track in your DAW. Align the part so that the synth fills begin playing at the start of bar 14.

- (a) Import 'synth example.wav' to a new track in your DAW. The file illustrates how bars 17–18 of the synth part should sound. You should not use this audio in your final mix.

Create a synth sound that matches the timbre 'synth example.wav' in the following ways:

- octave
- waveform
- polyphony
- portamento
- amplitude envelope
- filter
- LFO
- no effects.

(8)

- (b) In bar 20, there is a rhythm error. Correct the rhythm error in bar 20 so that the synth plays the same rhythm as the other even numbered bars.

(1)

Bounce/export the completed synth part as a single 16 bit/44.1 kHz stereo .wav file to the designated folder on your computer.

Name it 'q3_ your candidate number' (e.g. q3_1234).

(c) Figure 1 below shows a sound wave.

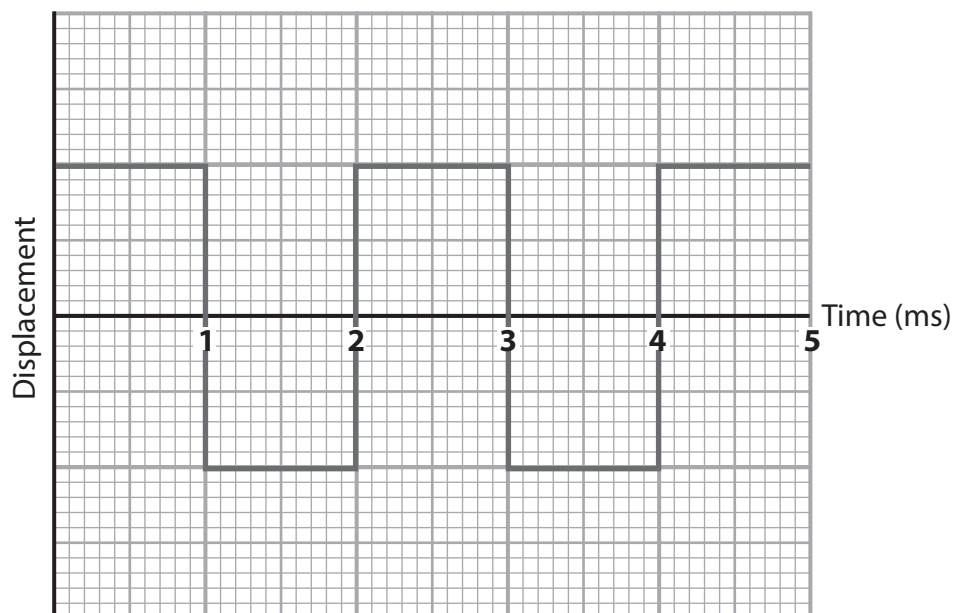


Figure 1

(i) Identify the waveform.

(1)

(ii) State the period of the wave in ms.

(1)

..... ms

(iii) State the period of the wave in s.

(1)

..... s

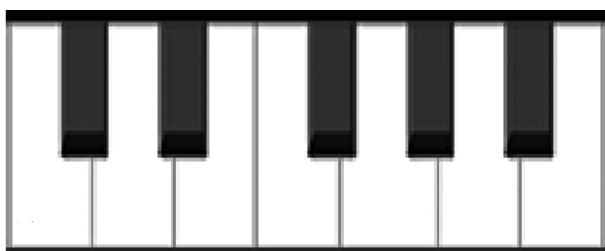
(iv) Calculate the frequency of the wave in Hz.

(1)

..... Hz

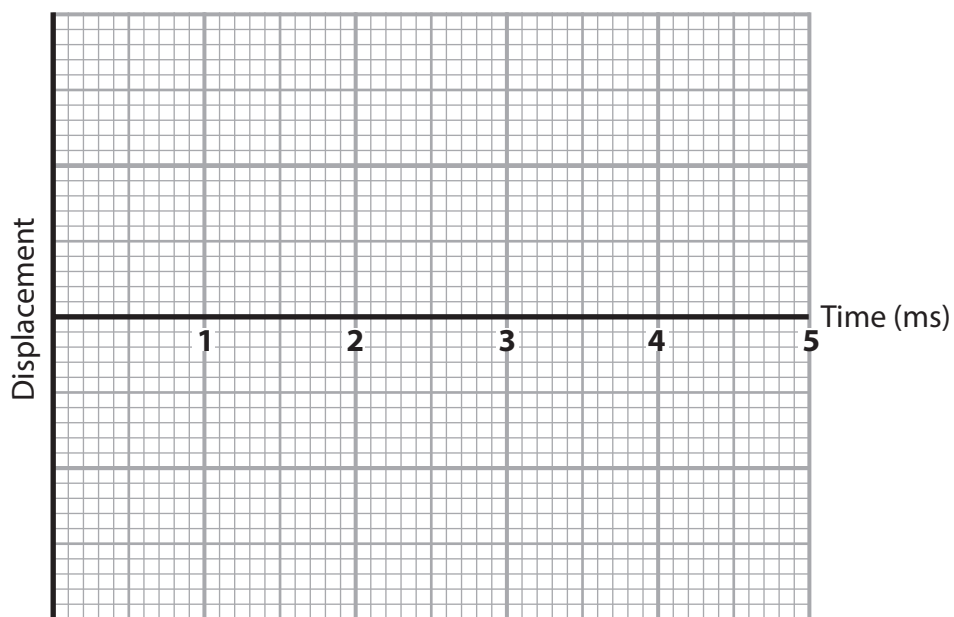
(v) Draw the approximate pitch of the waveform on the keyboard below.

(1)



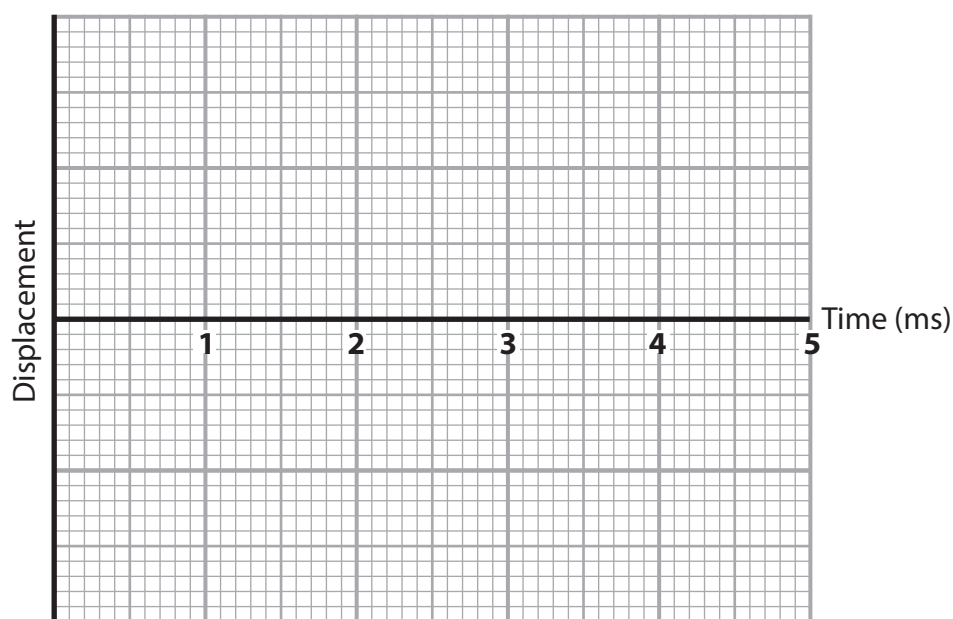
(vi) On the graph below, draw the same wave as in Figure 1, but louder.

(1)



(vii) On the graph below, draw the same wave as in Figure 1, but an octave lower.

(1)



(d) Compare how quantize is used on the drum part and the synth part.

(4)

(Total for Question 3 = 20 marks)

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Question 4 is about the vocal part.

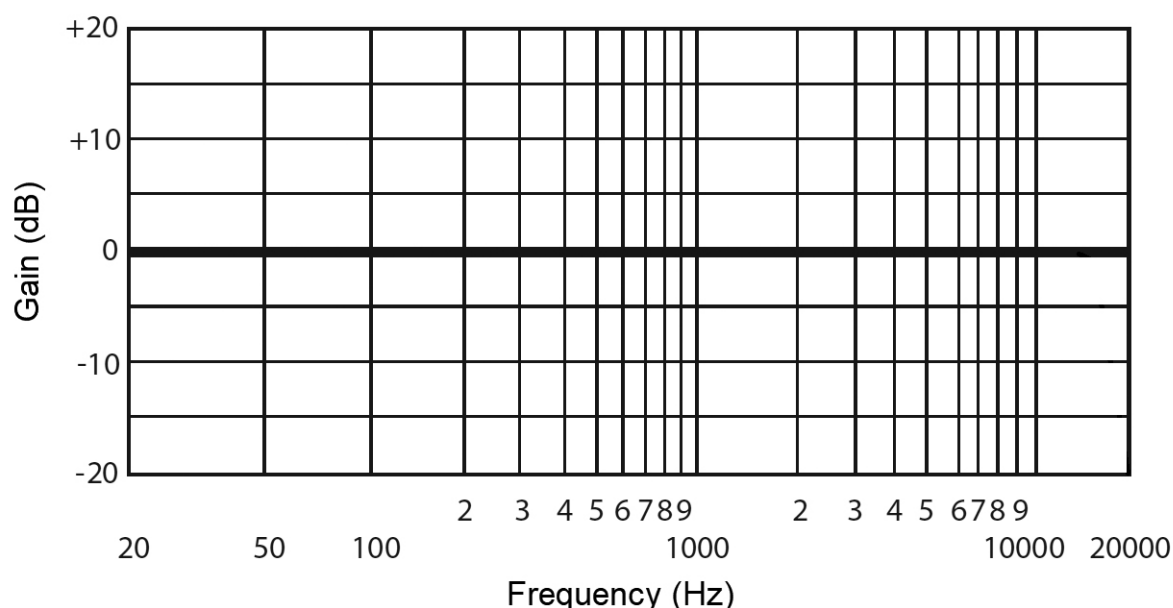
- 4 Import 'vocal.wav' to a new track in your DAW. This track is the lead vocal. Ensure that the beginning of this audio track is aligned with the start of bar 1. The vocal begins at the end of bar 2.

- (a) Pitch correction has been used on the vocal. Describe the use of pitch correction on the vocal in bars 6–19.

(2)

- (b) A high shelf boost has been applied to the vocal to make it brighter. On the graph below, draw the high shelf boost on the vocal.

(2)



- (c) The vocal was captured using a condenser microphone. As well as the high shelf boost, an HPF was also present.

From bar 6, analyse:

- the capture of the vocal
- how the characteristics of the recording have been affected by the EQ.

(8)

Handwriting practice area with horizontal lines.



- (d) (i) Identify which **one** of the following best describes what an analogue-to-digital converter does.

(1)

- ☐ **A** Converts binary code to varying voltage
- ☐ **B** Converts sound to a varying voltage
- ☐ **C** Converts varying voltage to binary code
- ☐ **D** Converts varying voltage to sound

- (ii) The image below shows the signal flow from the singer to the DAW. Draw an arrow to indicate where in the signal chain the analogue-to-digital converter is.

(1)



(Source: © A-R-T/Shutterstock)
(Source: © AlexRoz/Shutterstock)
(Source: © Passiflora/Shutterstock)

- (iii) Describe how increasing the sample rate and bit depth improve the sound quality.

(2)

Increasing sample rate

.....

Increasing bit depth

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(Total for Question 4 = 16 marks)



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QUESTION 5 BEGINS ON THE NEXT PAGE.



- 5 You should now have the following tracks in your DAW: bass guitar, acoustic guitar mic, drums, synth, vocal.
- (a) Apply double tracking to the acoustic guitar throughout.
- Pan each acoustic guitar part hard left and hard right.
- (3)
- (b) The vocal in the intro is already compressed. Compress the vocal from bar 5, 'The rain used to trouble me' until the end of the song.
- Ensure that all parts of the vocal can be heard above the other parts.
 - Ensure that the vocal does not get buried or jump out of the mix.
- (3)
- (c) The word 'love' at the end of bar 20 is an incorrect pitch. Retune 'love'.
- (3)
- (d) Apply reverb to the vocals.
- Apply reverb to the dry vocals from the end of bar 5, 'The rain used to trouble me' until 'my love' in bar 22. Match the reverb of bar 5 for the vocals through to bar 22.
 - In bars 2–5, the vocal appears to come closer with a reverb fade effect. In bars 22–25, recreate the reverb fade effect, but with the vocal getting more distant by the end of bar 25.
- (6)
- (e) Balance the levels of the mix.
- (3)
- (f) Top and tail.
- Remove any noise at the beginning and end.
 - Create a natural sounding fade at the end.
- (3)



(g) Produce a final stereo mix.

- Ensure that the mix output is at as high a level as possible.
- It should be free from distortion.
- Do not limit or compress the mix output.
- Ensure that the beginning and the end of the music are not cut off.
- Ensure that silences at the beginning and at the end are 1 second long.

(3)

Bounce/export the completed mix as a single 16 bit/44.1 kHz stereo .wav file to the designated folder on your computer.

Name it 'q5_ your candidate number' (e.g. q5_1234).

(Total for Question 5 = 24 marks)

TOTAL FOR SECTION A = 85 MARKS

SECTION B

Answer Question 6. Write your answer in the space provided.

- 6** Open a new project in your DAW using 16 bit/44.1 kHz sample rate.

Set the metronome to 120 bpm.

Import 'Q6.wav' to a new track in your DAW, aligned with the beginning of bar 1.
You should not use this audio in your question 5 final mix.

Listen to the analogue style drum sounds:

- Bar 1 is a bass drum
- Bar 2 is a snare drum
- Bar 3 are hi-hats
- Bar 4 are tom drums
- Bar 5 is a flex-a-tone
- Bars 7–10 are the drum sounds combined into a pattern.

Analyse how these drum sounds were made using synthesis.

(20)

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(Total for Question 6 = 20 marks)

TOTAL FOR SECTION B = 20 MARKS
TOTAL FOR PAPER = 105 MARKS

