Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel Level 3 GCE

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: Figure 1 for Question 6 (enclosed), 2022 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/44.1kHz 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 **75 bpm**.
- Import 'drums.wav' to a new track in your DAW, aligned with the beginning of bar 1.
- Ensure that the drums are audible and play in time with the metronome. The drums begin at the start of bar 2.
- 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, 3, 4 and 5 within the 2 hour 15 minute 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 drum part.

1 Listen to the drums that you have imported. 'drums.wav' is MIDI programmed.

(a) Identify the type of drum kit.

(1)

☒ **A** 1980s drum machine

☒ **B** Jazz drum kit

☒ **C** Latin drum kit

☒ **D** Rock drum kit

(b) Identify the most appropriate quantise value for the hi-hat.

(1)

☒ **A** 1/64

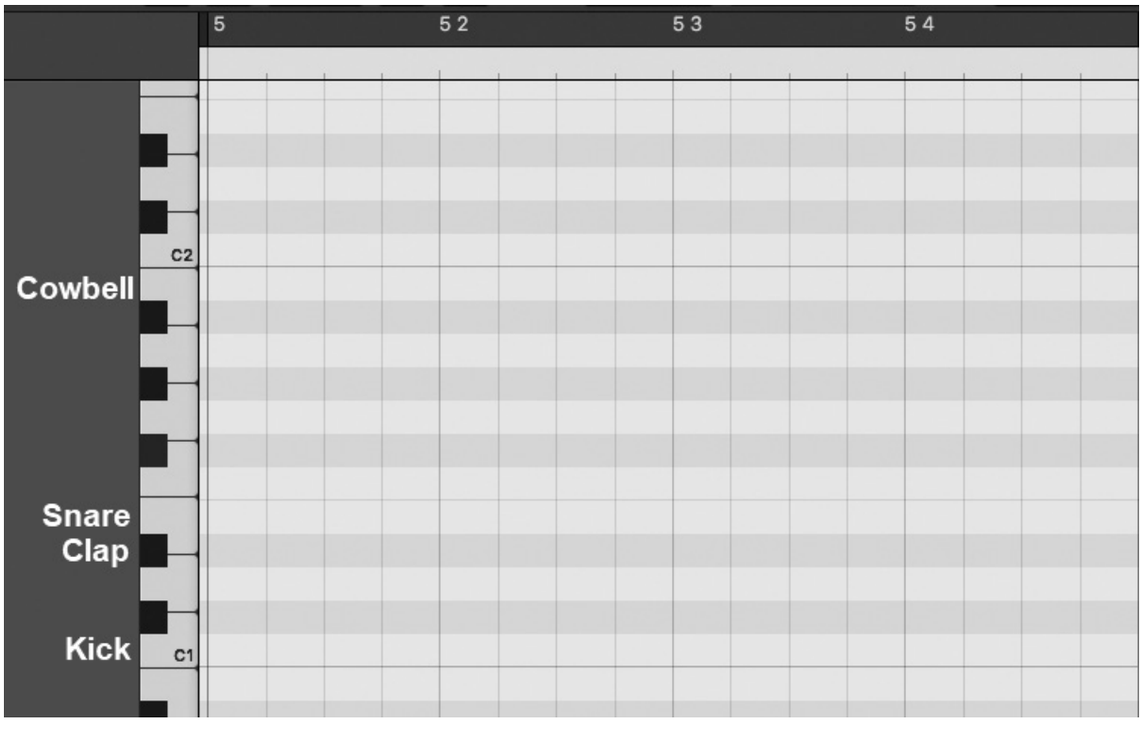
☒ **B** 1/32

☒ **C** 1/16

☒ **D** 1/12

(c) (i) Draw the kick, clap, snare and cowbell part for bar 5 on the piano roll editor below.

(4)



(ii) When programming MIDI drums, state why the length of the notes makes no difference to the sound.

(1)

.....

.....

(iii) Note velocity has a range of 0–127. State how many bits MIDI uses to represent these values.

(1)

.....

(iv) All drum sounds have note velocity of 98. Calculate the value of 98 in binary.

(1)

.....

(d) In bars 15–19 of 'drums.wav' there is some distorted vocal.

(i) Identify the type of distortion added to the vocal.

(1)

- ☒ **A** Bit crusher
- ☒ **B** Hard clipping
- ☒ **C** Soft clipping
- ☒ **D** Valve guitar amplifier

(ii) Remove the distorted vocal whilst leaving the drum part unchanged.

(5)

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

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

(Total for Question 1 = 15 marks)

Question 2 is about the bass part.

2 Import 'bass.wav' to a new track in your DAW. The beginning of this audio track should be aligned with the start of bar 1. The bass begins at the start of bar 4.

(a) Describe how this bass part would translate when playing back on an internal mobile phone speaker.

(3)

(b) Explain why the envelope settings cause a click in bar 25.

(2)

(Total for Question 2 = 5 marks)

Question 3 is about the piano part.

3 Import 'piano.wav' to a new track in your DAW. The beginning of this audio track should be aligned with the start of bar 1. The piano begins at the start of bar 4.

(a) The piano in bars 4–5 has three inserts.

(i) The first insert increases the piano's sustain. Identify the processor.

(1)

- ☒ **A** Chorus
- ☒ **B** Compressor
- ☒ **C** Reverb
- ☒ **D** Tremolo

(ii) The second insert detunes the piano and gives the mono piano stereo width. Identify the processor.

(1)

- ☒ **A** Chorus
- ☒ **B** Compressor
- ☒ **C** Reverb
- ☒ **D** Tremolo

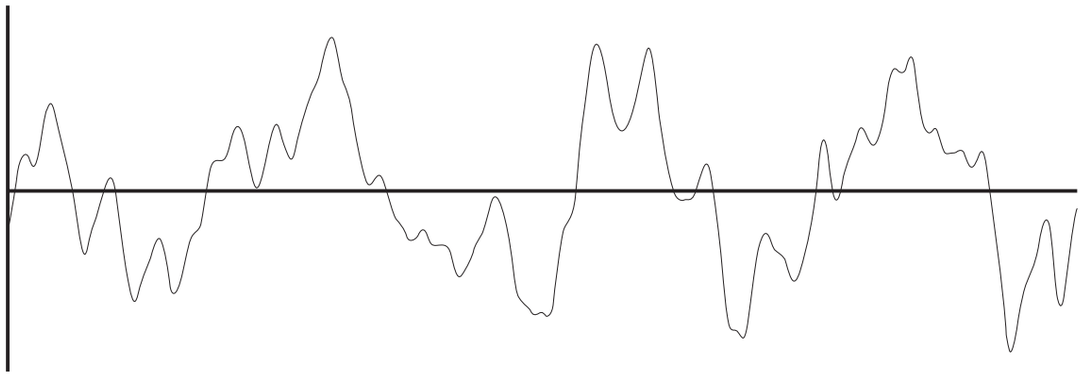
(iii) The third insert is distortion. The graph below shows the waveform of piano before distortion in bar 4.

- Label the axes.

(2)

- On top of the original waveform, draw the change in the waveform shape once distortion has been added.

(2)



(b) Recreate the same piano sound as bars 4–5 for the whole piano part.

(7)

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

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

(Total for Question 3 = 13 marks)

Question 4 is about the rap vocal and the scratch vocal.

4 Import 'rap vocal.wav' to a new track in your DAW. This track is the rap vocal part. Ensure that the beginning of this audio track is aligned with the start of bar 1. The vocal begins during the third beat of bar 3.

(a) Compression is used on the rap vocal.

(i) A compressor reduces dynamic range. Give a reason why the recording engineer compressed the rap vocal.

(1)

.....

(ii) State a disadvantage of compressing the rap vocal.

(1)

.....

(iii) The compression settings are:

- Threshold: -30dB
- Ratio: 10:1
- Knee: hard
- Gain make-up: 10dB

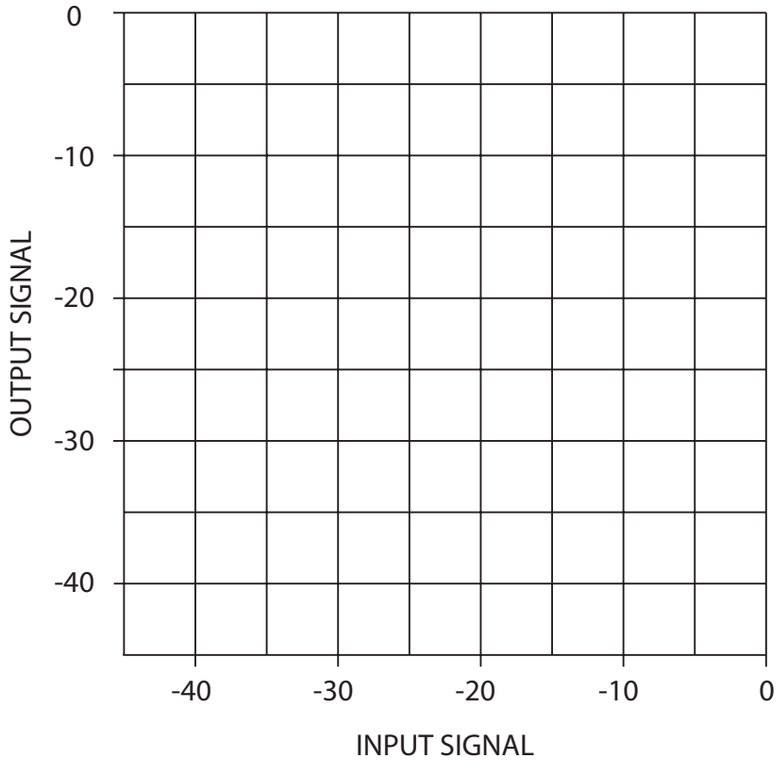
On the graph below:

- Label the units on the axes.

(2)

- Draw the response curve of the compressor.

(5)



(b) The rap vocal was captured using a handheld microphone. A high shelf EQ boost was added.

Analyse the capture and how the characteristics of the recording have been affected by the EQ.

(8)

(c) Import 'break up with your girlfriend extract.wav' to a new track in your DAW. The file is an extract of 'break up with your girlfriend, i'm bored' by Ariana Grande. You should not use this whole file in your final mix.

(i) The file was downloaded from iTunes using AAC, and then converted to wav. State how the conversion from AAC to wav affects the file.

(1)

☒ **A** File size is decreased.

☒ **B** Sound quality is significantly improved.

☒ **C** Sound quality is significantly reduced.

☒ **D** There is no significant difference in sound quality.

(ii) The original tempo of 'break up with your girlfriend, i'm bored' was 85 bpm. The tempo of 'break up with your girlfriend extract.wav' has been reduced to 75 bpm. Identify the processor that has been used to decrease the tempo.

(1)

☒ **A** Pitch correction

☒ **B** Pitch shift

☒ **C** Quantise

☒ **D** Time stretch

(iii) Import 'scratch vocal example.wav' to a new track in your DAW. The file illustrates how bar 29 of the scratch vocal part should sound. You should not use this audio in your final mix.

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

Create a scratch vocal part.

- Using 'break up with your girlfriend extract.wav', sample the sung phrase "You without me" ensuring that no other instruments are present.
- Use 'scratch vocal.mid' to trigger the sample.
- The sample must play the pitch and rhythm as illustrated in 'scratch vocal example.wav'.
- Match the pitch bend range with 'scratch vocal example.wav'.

(9)

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

Name it 'q4_ your candidate number' (e.g. q4_1234).

(Total for Question 4 = 28 marks)

5 You should now have the following tracks in your DAW: drum, bass, piano, rap vocal and scratch vocal.

(a) Remove the noise in bars 1–3 of the rap vocal.

(2)

(b) Apply automated panning to the scratch vocal.

- Only bars 20–21 should be affected; all other bars should be panned to the centre.
- Bar 20 should be panned hard left.
- Bar 21 should be panned hard right.

(3)

(c) Gate the piano.

- Only bars 12–18 should be affected.
- The kick, snare and clap should trigger the side chain of the gate so that the piano plays in time with them.
- The hi-hat and cowbell should not trigger the side chain.

(3)

(d) Create a double tracked backing vocal for the phrases "stage fright" and "take flight" in bars 26 and 28.

- The words of the backing vocal should be the same as the lead vocal.
- Pan each backing vocal part hard left and hard right.
- Apply a short reverb to the backing vocals.
- Ensure that the lead vocal is still present in the centre.

(5)

(e) Listen to the vocal delay in bar 11. Recreate the same delay on "message like" in bar 19.

(5)

(f) Balance the levels of the mix.

(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 do not exceed one second.

(3)

Bounce/export the completed mix as a single 16 bit/44.1kHz 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 Figure 1 shows a bass guitar pedal board. Evaluate the suitability of pedal settings for a funk bass guitar.

(20)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

(Total for Question 6 = 20 marks)

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

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

Pearson Edexcel Level 3 GCE

Time 2 hours 15 minutes
plus 10 minutes setting up time

Paper reference **9MT0/41**

Music Technology

Advanced
COMPONENT 4: Producing and Analysing
Figure 1 for Question 6

Do not return Figure 1 with the question paper.

Turn over ▶

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Figure 1


CHECK
ATTACK
FREQ
SENS
OUTPUT
GUITAR IN
EXP/CTL
BASS IN
Dynamic Wah
AW-1
CHECK
LEVEL
EQ
BALANCE
GAIN
MIN MAX
CUT BOOST
HIGH
LOW
DRY OD
MIN MAX
OUTPUT
INPUT
Bass
OverDrive
ODB-3
50 120 400 500 800 4.5k 10k Level
OUTPUT
INPUT
Bass
Equalizer
GEB-7
COMP
OUTPUT
INPUT
Compressor
CP-1