Examiners' Report
Principal Examiner Feedback

Summer 2024

Pearson Edexcel GCE
Music Technology (9MT0)
Paper 04

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9MT0/04 2025 Principal Examiner's Report to Centres

This report should be read in conjunction with the published mark scheme.

Examiners received work that scored across the full range of marks, so the exam differentiated well across the expected ability range, reliably measuring the candidate's ability level. Most candidates excelled in some areas more than others; they did not perform uniformly across the whole paper.

For the practical work for this unit, LWT worked well again this year. Usually, work was well labelled and easy for examiners to locate. Centres are reminded that files should be submitted as a ZIP file in the format "[centre name]_[centre number]_[candidate name]_[candidate number]." (e.g. *AnySchool_66666_FredBloggs_1234*).

Please take care when uploading candidate work. Some centres supplied incorrect submissions such as:

- not uploading work for some candidates
- uploading the question paper files in addition to or rather than the candidate's answers
- including DAW files (please don't include DAW files because these cannot be assessed on this unit).

Candidates are advised to listen back to their bounces during their exam in their entirety using media player software like QuickTime to ensure they play back as expected. They should do this whilst they still have time to spare to make any changes if it hasn't worked as they expected.

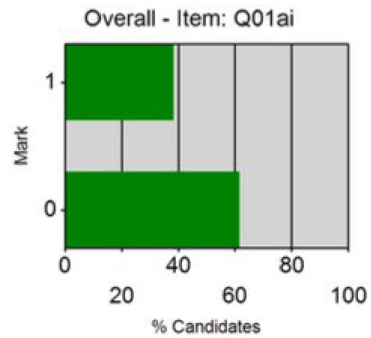
Issues with candidate bounces included:

- incomplete bounces, i.e. bars missing. Very commonly in question 3, the candidate only bounced from bar 14 to the end of bar 22. Some candidates cut the note in bar 22 and couldn't gain full credit for Q3(b).
- bounces at the wrong speed, so the candidates could not receive credit for correct rhythm of the drums in Q2 and the synth part in Q3.
- metronome left on. Therefore, for example, synth attacks and glitches could not be credited.
- bouncing with other parts; a few candidates included the bass with their acoustic guitar in Q1, meaning glitches could not be assessed as the acoustic guitar wasn't soloed.

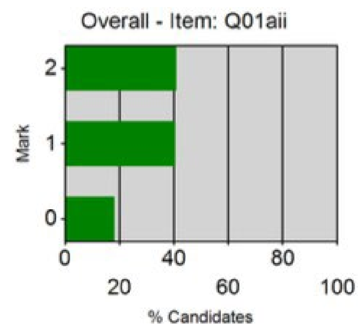
Other than for question 5, candidates are advised to bounce the whole track from bar 1 to the end, which ensures that they have included all of the work they need to.

Question 1

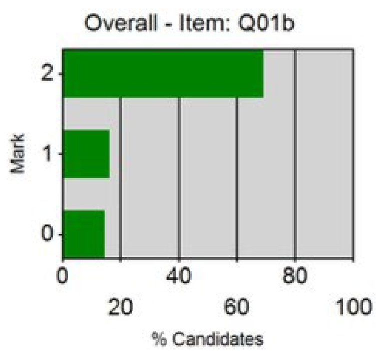
Q1(a)(i) Most candidates answered C (DI), which was incorrect; the bass part was MIDI sequenced. This may have led them to approach their answer to Q1(a)(ii) differently as they were giving two characteristics of a DI'd bass part. This meant that they usually missed out some of the simpler answers to do with sequencing e.g. same velocities / quantised.



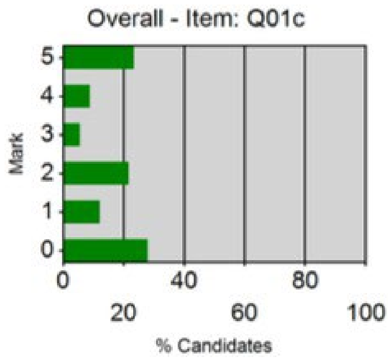
Q1(a)(ii) Most candidates achieved at least one mark here. Common marks that gained credit were for referring to lack of hiss / noise, lack of reverb, or the fact the notes were the same velocity / volume. As identified above, responses were influenced by Q1(a)(i). Some candidates relied on their rote learning to give characteristics of a bass guitar recorded via DI and did not identify features of the MIDI sequenced audio stimulus.



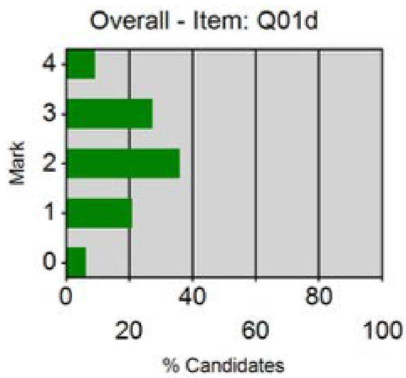
Q1(b) The wide majority of candidates did very well on this question; this demonstrates that candidates are confident in using their DAW software to help them problem solve. Candidate sometimes drew notes with lengths that were too short but that had the correct starting points; this led to a mark of a maximum of 1.



Q1(c) This task was met with mixed success. A small percentage of candidates achieved a seamless edit. Many attempted to correct the error using pitch correction, which introduced unwanted artefacts, normally from bar 17 onwards, and did not solve the problem. To gain any credit, candidates had to make an attempt at *editing* the audio, not just adding pitch correction or effects. Others took a chord from a different part of the track and edited it into place, but timing issues sometimes affected the strumming pattern. Those awarded full marks removed the incorrect chord entirely, replaced it with the correct one, ensured the strumming pattern was accurate, and created a smooth transition with no glitches.

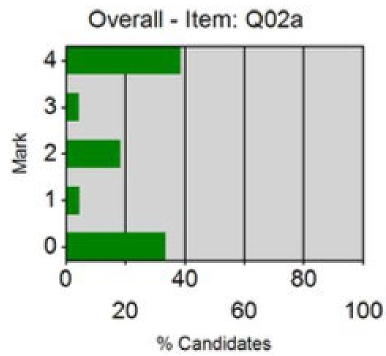


Q1(d) A common answer was that the DI *'sounds cleaner'* - candidates needed to be more specific to gain credit, for example by stating that the DI had *'less noise'*. Some candidates made more general comments such as *'The DI has less of the sound of the strings',* which did not gain credit. A surprising number of candidates thought that the DI was brighter than the microphone track. The most common marks awarded were for the fact the mic sounded 'full', there was less ambience on the DI track and there was less noise on the DI.



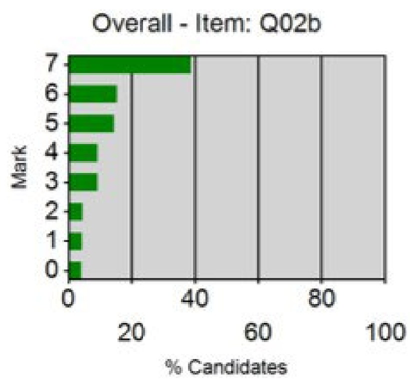
Question 2

Q2(a) Several candidates scored half marks because they had misidentified one of the initial velocity values; a smaller number misidentified both values. Clearly most candidates are now comfortable with decimal to binary conversion, and there were very few blanks. Common mistakes were candidates reversing the numerical order of binary or adding 0s to the end of the binary velocity. A few candidates wrote the velocity value after a decimal point (e.g. 0.97 or 0.23). The question clearly differentiated between those with a clear understanding of how to find MIDI data in their DAW and converting this to a binary value from those who did not. This year, candidates seemed to find it harder to find the correct velocities, perhaps showing that they were less confident in using their DAW's list editor.



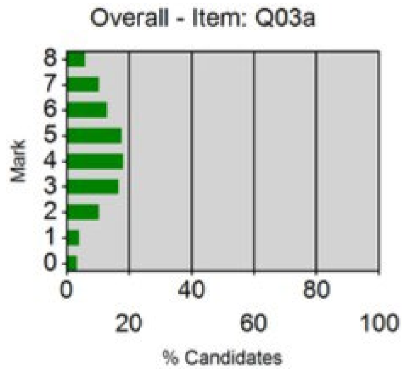
Q2(b) The majority of candidates completed this task accurately. Some were confused by the tom fills, occasionally getting the high and mid toms the wrong way around or mixing up the toms and the crash. Sometimes, candidates mixed up all of the drum parts so e.g. the kick drum played when the hi hat should have which produced an unmusical response. Candidates are reminded to consider whether the drum part they have created makes musical sense in the context of the song.

When candidates moved sections of the sequence as blocks, timing errors were sometimes introduced—shifting whole parts forwards or backwards by a beat or more. Nearly all candidates correctly selected an acoustic drum kit.



Question 3

Q3(a) For this question, candidates had to create a synth sound based on an audio example; they were given bars 17 and 18. There was a great spread of marks, indicating that it differentiated effectively between candidates. Some candidates incorrectly left the example audio in the mix. Only a small number of candidates achieved full marks.



The most common errors overall were:

- the synth had polyphony which cause note overlaps (the example is monophonic)
- addition of stereo processing e.g. reverb added
- attack too fast on amplitude envelope
- no audible portamento

Pitch – the wide majority of candidates correctly matched the octave to the example. By far the most common error was the pitch being an octave too high or an octave too low. One or two lost the mark as their oscillators had significant detuning, rendering the synth slightly out of tune in a way which became intrusive in the final mix.

Waveform – most candidates used a square, triangle or sawtooth waveform. Around 10% used sine waves, which lacked the required upper harmonics but conversely did score a mark below for filtering, as by nature, a sine wave is dull sounding. There seemed to be many fewer MIDI piano sounds this year compared to previous years.

Polyphony – the most common issue was not correcting the polyphony, resulting in overlapping notes and compromised envelopes, scoring zero in both areas. Only the top 10-15% of candidates switched the timbre to monophonic to avoid this.

Portamento – some candidates applied portamento but it was relatively common for this to be missing. Around 50% of candidates were able to apply subtle portamento to their synth timbre to create gradual movement between the notes.

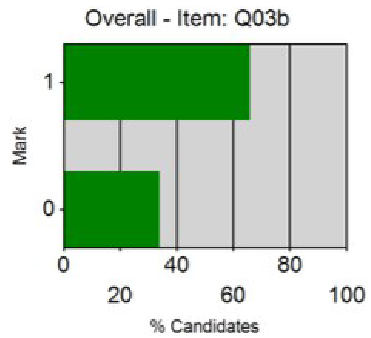
Envelopes – interestingly, only the very top performing candidates were able to match the amplitude envelope correctly. Attack time being too short, causing a hard attack not present on the synth example was the most common error, but it was also very common for the amplitude envelope to be unassessable due to the note overlaps caused by the polyphonic timbre.

Filter – the majority of candidates were able to use a low pass filter to remove some of the brightness to match the dull tone of the synth example. Candidates who chose a sine wave for the timbre gained credit here as by nature, the timbre is dull. Where candidates did not achieve this mark, it was usually due to the cutoff frequency being too high, resulting in a tone that was significantly brighter than the synth example

LFO – the wide majority of candidates managed to add subtle movement to the sound using an LFO. Whilst the example has an LFO controlling cutoff frequency, examiners gave credit for LFOs that modulated the volume or pitch to give tremolo or vibrato as long as they were holistically similar to the example audio. Some candidates were unsuccessful due to the rate being too slow, or the depth being too high, meaning that the effect was no longer subtle.

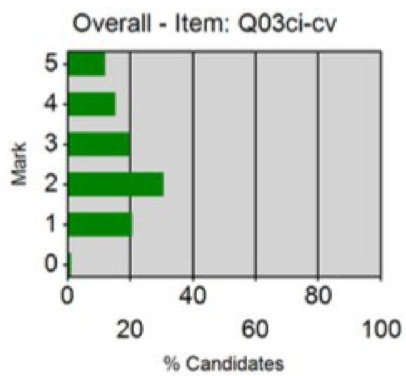
Effects – a significant number of candidates included stereo elements, most commonly reverb or modulation effects. The example was mono, so if the synth sound they created had stereo elements, candidates could not gain credit here.

Q3(b) Most candidates corrected the note timing. A small number misread the question and attempted to copy and paste a different bar, leading to pitch errors. The majority of candidates were able to successfully correct the rhythm of this part without introducing additional errors. Some candidates did not correct the rhythm error, and some candidates introduced a pitch error because the final note was in the wrong octave. Some candidates chopped off the end of their bounce which meant that pitch and rhythm could not be assessed, scoring 0.



Q3(c)(i-v) This set of five linked questions produced a good, even spread of marks. There were some confident responses that were fully correct, often complete with written-out working showing they knew the formula to find frequency from the period, and the pitch was correctly given, sometimes even correctly noting it was slightly sharp. On the other hand, many were unclear about how many milliseconds in a second. A tiny proportion didn't recognise the wave type and scored 0.

Examiners allowed 'error carried forward' marks for part (iii) onwards; so if candidates had got part (ii) incorrect but their answer for part (iii) was correct for their response, marks were awarded.



(i) The vast majority of candidates (97%) correctly identified the square wave.

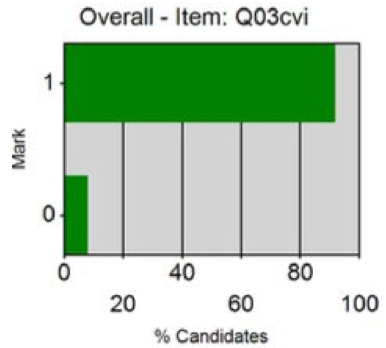
(ii) Most candidates were able to state the period in ms (67%), although 1ms was a common incorrect answer. It is likely that these students did not know that period was the time taken for one full wave cycle.

(iii) A common incorrect answer was 0.02s, demonstrating that candidates thought that there were 100ms in 1s. 40% of candidates scored a mark for this question.

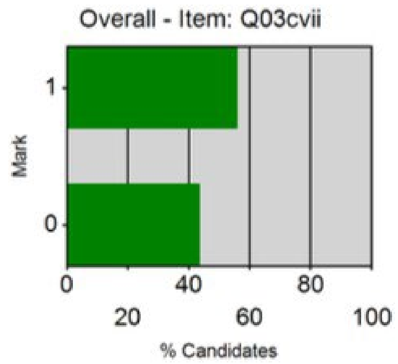
(iv) There were many incorrect answers for the frequency in Hz, and they were often incorrect in terms of the answer given in (iii). 35% of candidates scored a mark for this part of the question.

(v) This question was designed to stretch the most able candidates and thus was often left blank; there were a few answers that agreed with the value given in (iv) but some candidates seemed to guess a frequency. 22% of candidates scored a mark for this question; examiners awarded a mark for a pitch of B if they got part (iv) correct. As above, error carried forward was allowed for part (iv), so examiners awarded 1 mark for the correct pitch derived from the candidate's frequency in part (iv) if it was 30Hz or higher.

Q3(vi) It was very common for candidates to get both of the graphs for parts vi and vii correct. The majority of candidates were able to correctly draw a louder wave. Very few drew a wave that had a different pitch or had a DC offset. Some candidates only drew one cycle of the wave so did not score credit.

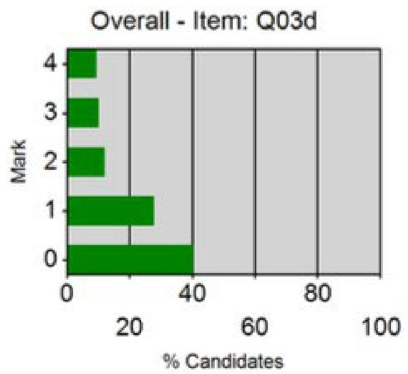


Q3(vii) Around half of candidates drew a wave with double the period.



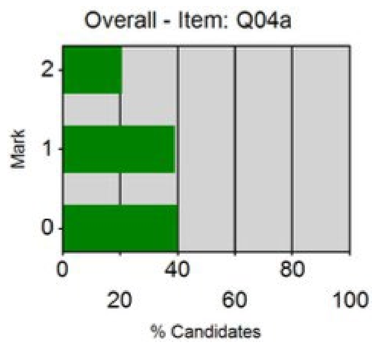
Q3(d) This question elicited a variety of responses. A very common misconception that likely had its roots in rote learning was that the drums were strictly quantised and sounded mechanical. In fact, on the recording, the drums are groove quantised with the guitar. Another common misconception was that the drums were quantised to a small resolution e.g. 1/64 to maintain the loose timing, which is incorrect. In fact, it was the synth part that was hard quantised.

There were numerous general descriptions of ‘quantise’, which sometimes showed a lack of understanding. A lot of responses discussed note lengths as opposed to positioning and whether notes overlapped or not, and many focused on differing note velocities rather than timing. The most common correct point was noting a 1/8 or 1/16 value for the synth.

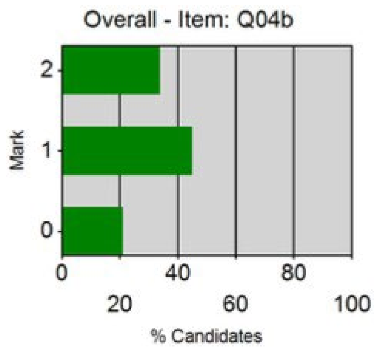


Question 4

Q4(a) Marks were fairly spread here; it was common for candidates to give a description of pitch correction, which did not answer the question. In the vocal part, the pitch correction was subtle, in line with the folk style of the song. A surprising number of candidates thought that the pitch correction was 'extreme' and sounded 'robotic', or that a fast response time would be suitable. However, most candidates identified that the pitch correction was light and that it made it sound natural. Fewer mentioned the response time / tolerance / vibrato.



Q4(b) Those who scored full marks had clearly demonstrated their knowledge of how to draw a high shelf boost. Sometimes candidates drew the cutoff frequency too low or too high or went over 10dB of boost.



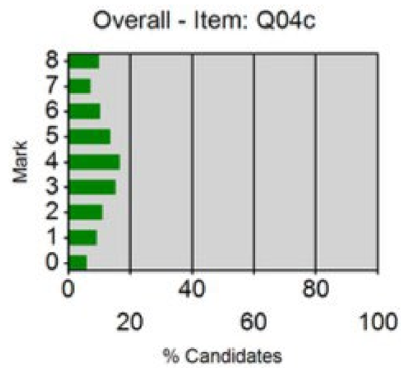
Q4(c) In this question, candidates were asked to analyse two aspects of the vocal part, namely its capture, and how the characteristics of the recording were affected by EQ.

They were given in the question that an HPF was present, and in the previous question that a high shelf boost was present. Candidates often didn't answer the whole question, either writing more about EQ and missing some easier marks to do with capture, or by not linking their points to either EQ and thus limiting the credit the examiner could award.

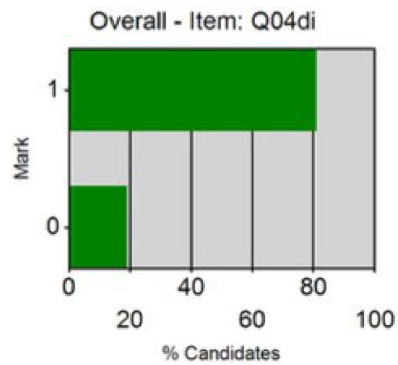
Candidates who scored 8 marks addressed both capture and EQ; in their response, EQ was properly referenced to HPF and high shelf boost meaning that their answers often maxed out.

Most candidates scored credit for demonstrating their understanding of the frequency response and polar pattern of a condenser microphone. Many identified that it was a close-mic recording with a pop shield and correctly analysed the impact on room reverb and plosives. It was common for candidates to incorrectly state that pop filters reduced high frequency noise such as sibilance. A few of the best answers discussed the importance of setting the correct recording level to capture the widest dynamic range yet avoid distortion.

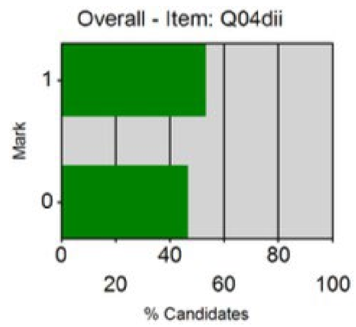
Although many understood that the HPF would cut unnecessary low frequencies, only a few fully analysed the impact of the filters on the vocal track. Some candidates thought that the high shelf boosted the high notes in the singing so that was why they were louder; this is a misconception - making an incorrect link between the pitch of the singing and the frequency content. Candidates commonly wrote that the high shelf made the vocal *'bright'* or *'boosted the high frequencies'* but candidates were given this information in the previous question and thus scored no credit for just repeating the question.



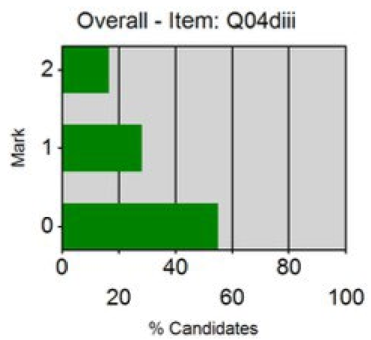
Q4(d)(i) Most candidates answered C (*'Converts varying voltage to binary code'*) correctly. You could see from candidates' handwritten notes that they normally did this through elimination.



Q4(d)(ii) Just over half of candidates were able to identify the ADC; those that scored 0 tended not to attempt this question. A few students drew an arrow pointing to the microphone or the computer. A few others drew arrows that pointed to the cables rather than the ADC itself.



Q4(d)(iii) Responses for this question were mixed; many candidates simply gave descriptions of the terms ‘sample rate’ and ‘bit depth’. Sometimes candidates mixed up sample rate and bit depth, linking sample rate to improved accuracy of amplitude measurements and bit depth to frequency. Those that gave correct and focused answers that answered the question achieved both marks.

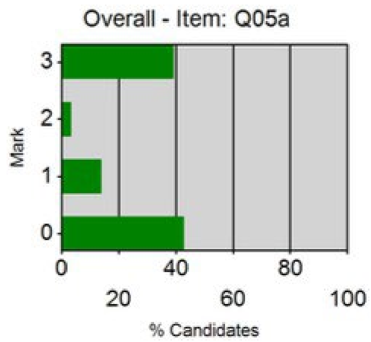


Question 5

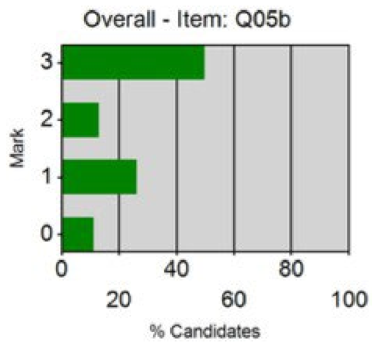
This question had a range of editing, processing, and effects-based tasks to cater for a wide range of candidate ability. For example, Q5(c) was targeted at lower grade candidates, and Q5(d) was targeted at high grades for full marks though lower grade candidates could also score some marks.

Candidates should answer the questions and not add other creative panning, dynamic processing, EQ and effects not specified in the question because such extra processing could mask the questions that are being assessed.

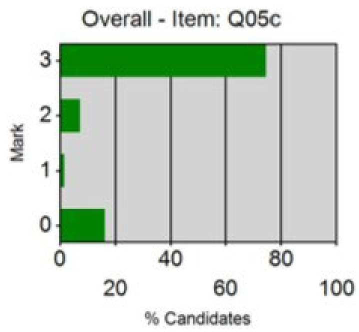
Q5(a) As in previous years, candidates found recreating the doubletracking effect challenging. Few managed to create a wide ADT effect. Some produced a narrow doubling effect, only noticeable when phase inverting a channel. Many candidates did not attempt the process or simply duplicated the guitar part on another channel, increasing its volume instead of creating the intended effect. A few candidates tried to use the Acoustic Guitar DI track to create doubletracking, but as this track stopped abruptly at bar 14, so did the doubletracking.



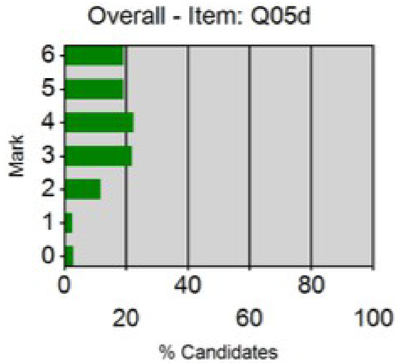
Q5(b) The wide majority of candidates successfully applied compression to the vocal part, which made the dynamic range in the verse and the chorus more even. Most candidates applied some form of compression. However, many failed to set a sufficiently low threshold or use a high enough ratio, resulting in there still being some pronounced peaks in the verse and chorus. In the vocal question paper audio, there are pronounced peaks at bars 14-15 and 18-19, and there are dips at bar 6 and 17. Some candidates added additional compression to bars 2–5, which were already compressed, highlighting the importance of paying attention to the bar number ranges in the question.



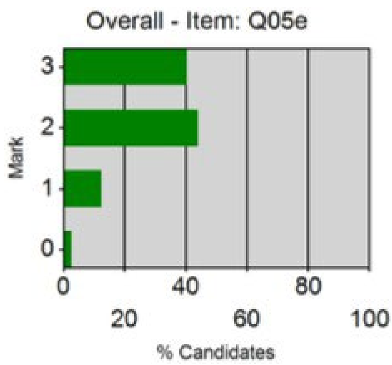
Q5(c) Almost all candidates achieved full marks for this task, successfully correcting the pitch of the designated word without introducing unwanted artefacts. A few candidates corrected the note to the wrong pitch.



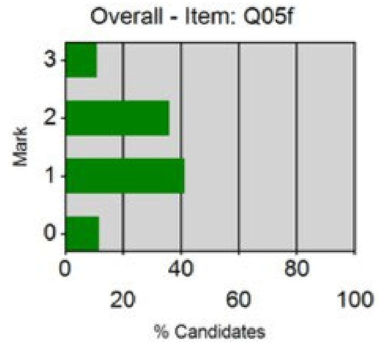
Q5(d) This question led to a spread of marks, and targeted a spread of grades including A* for the last mark. In general, the majority of candidates added reverb to the vocal in bar 5-22 and from bar 22-25. However, most candidates struggled to create the distance effect where the dry signal fades out. Some candidates faded the vocal without adjusting the wet / dry balance, while others faded the dry signal but not fully to -∞. Those awarded full marks created a musical fade-out, leaving only the wet signal by bar 25. A few candidates applied a mono reverb rather than stereo. Some candidates automated the length of the reverb time / RT60, perhaps as this had featured on a previous paper - indicating the importance of listening carefully, and responding to the specific musical material you have in front of you.



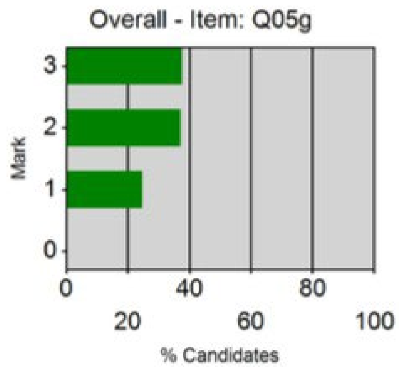
Q5(e) The stems are deliberately mastered at wildly varying volumes to ensure that the candidate needed to listen (rather than look at fader positions) to earn credit. Many candidates achieved a good balance and achieved 3 marks. Some candidates scored 2 marks because one part was under or over balanced. Most commonly, the synth was too loud in the chorus, masking the vocal part. In the stems, the bass track is loud, so candidates often mixed the bass quite loud in the mix.



Q5(f) Candidates often struggle to successfully top and tail their mixes for 9MT0/01 and 9MT0/02 so this question was designed to support them in completing these tasks. Many candidates did not fully remove the noise from the start of the track, perhaps failing to zoom in or listen carefully and thus leaving residual noise. When the drums were out of sync, examiners could not assess the first mark here as the drums masked the noise. Aggressive edits sometimes resulted in clipped strums at the start or truncated tails. Many candidates removed the noise successfully and added a fade at the end, but few achieved a musical fade-out between bars 27–29. Often, fades were too abrupt or ended early – before bar 27.



Q5(g) Many candidates achieved full marks for this, submitting a clean final mix. Sometimes, if candidates had not achieved a successful fade in Q5(f), they cut the tail, which impacted their mark here. Some tracks included more than one second of silence at the start or end. In rare cases, audio or MIDI parts were not aligned correctly (usually the drum part which tended to start a bar early) because candidates had not carefully followed the instructions in the question paper. This led to sync issues.

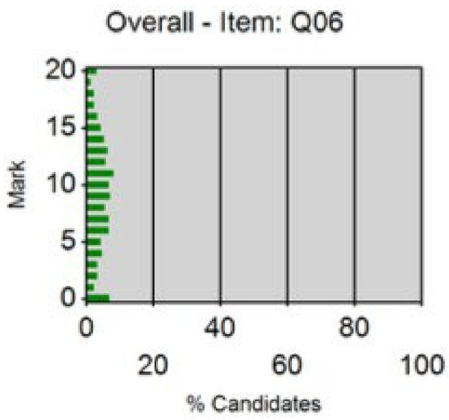


Question 6

This question was designed to differentiate across all of the grades, including A*.

Fewer candidates this year structured their answers in AO3 / AO4 tables. This was a wise decision; as was the case in previous years, candidates are not good at identifying an AO3 or 4 point themselves. Candidates are better off not troubling themselves with AO3 and AO4 and just enjoying demonstrating their understanding and analysis.

More candidates used subheadings to divide up their answer this year, and answers tended to be structured so they went through each part of the drum kit. This was a successful approach and is valuable exam technique. The most successful candidates were precise with their use of technical vocabulary and were able to demonstrate an impressive depth of knowledge, often receiving a lot of credit for a single, well constructed sentence. The graph below shows that there were some 0 mark answers; these candidates likely ran out of time.



Headlines

- Many candidates correctly identified the waveform for each element of the drum kit, but many lost marks by offering two choices, for example *'the toms were made from either a sine wave or a square wave'.* This is what an examiner would refer to as 'SONC' or 'split option / no credit'. Essentially, the candidate has offered two contradictory points in their response, so neither can gain credit.

- In describing the amplitude envelope, many marks were gained by identifying that most of the instruments had a fast attack, but a common misunderstanding was that the sustain part of the envelope is a measure of time rather than a level.

- Sometimes, candidates used confused terminology like *'low attack'*; in this case, it isn't clear whether the number is low (so the attack is fast), or the attack is slow.

- On the whole, the impact of high pass filters and low pass filters were well understood. However, there were some difficulties differentiating between the filter sweep on the snare and the use of the pitch envelope on the toms and the flexatone.

- The best answers demonstrated understanding of how the fast attack caused clicks on the bass drum and how this impacted the sound, and also correctly analysed the sonic features of the flexatone.