Mark Scheme (Results)

Summer 2019

Pearson Edexcel GCE
Music Technology (9MT0)
Paper 04: Producing and Analysing

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Summer 2019
Publications Code 9MT0_04_1906_MS
All the material in this publication is copyright
© Pearson Education Ltd 2019

General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

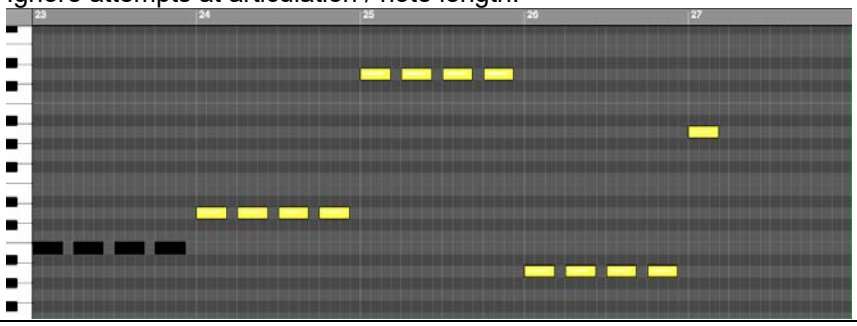
Question Number	Answer	Mark
1(a)(i)	Hum / buzz / ground loop / interference (1) Hiss / white noise (1) Finger movement (1)	1

Question Number	Answer	Mark
1(a)(ii)	Any two of the following: Turn off lights (1) DI box (1) not just “DI” Pre-amp (1) Ground lift (1) Changing position/angle of bass player (1) Turn up bass guitar to full (1) Balanced cable / XLR (1) Humbucker/noiseless pickups (1) Use a shorter cable (1) Keep electrical cables away from jack lead (1) Isolated power supply (1) Ask performer to not move fingers as much (1)	2

Question Number	Answer	Mark
1(b)(i)	Noise/sound is removed/ reduced (1) below (1) the threshold. OR If the threshold is higher, more noise/sound is cut (2).	2

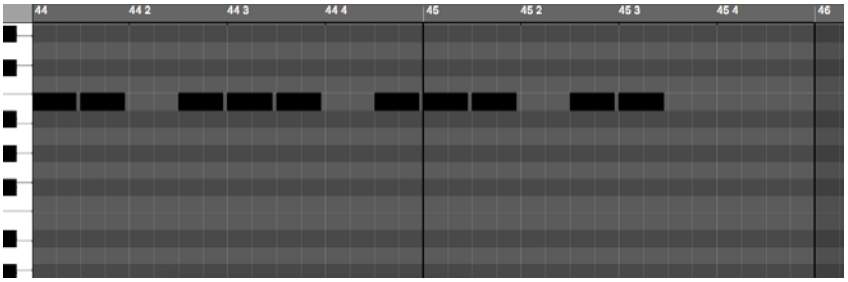
Question Number	Answer	Mark
1(b)(ii)	If noise is loud/similar to bass (1), a high threshold would be needed (1) so some of the bass will be cut (1). Whilst the bass is playing, the noise will still be present (1); the gate won’t cut out noise when the bass is playing (1). Long attack/ lack of look ahead could cut off the starts of notes (2). Long release could leave noise in (1). Short release could cut the ends of notes off (2) Short attack/release could cause clicks (1). The bass has been compressed (1).	2

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>1(c)</td><td>Ungated hum will be most audible in the intro and in the rests in the verse and chorus riff.
<table>
<tr><td></td><td>Gating the bass guitar.</td></tr>
<tr><td>3</td><td>Hum removed with no bass cut similar to ‘MS q1.wav’.</td></tr>
<tr><td>2</td><td>Gating on nearly all rests but some noise left in (candidate C).
OR
Attack/release too short causing clicks.
OR
Hum removed with some bass cut.</td></tr>
<tr><td>1</td><td>Gating on a few rests with most noise left in (candidate B).
OR
Intrusive gating (including notes missing)
OR
Just noise in bars 2-3 is removed.
OR
Gating but additional noise introduced.</td></tr>
<tr><td>0</td><td>There is no audible gating.</td></tr>
</table>
Award 0 if the bass is not soloed.
Max 1 if metronome is switched on.</td><td>3</td></tr>
</table>

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>1(d)</td><td>1 mark for each correct pitch (4)
1 mark for the correct rhythm throughout (1)
Ignore attempts at articulation / note length.
 
</td><td>5</td></tr>
</table>

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>1(e)</td><td>Listen to the bass bars 44-45.

All pitches correct in 44:1-45:2 (1)
All rhythm correct in 44:1-45:2 (1)
45:3 has correct pitch and rhythm (1)

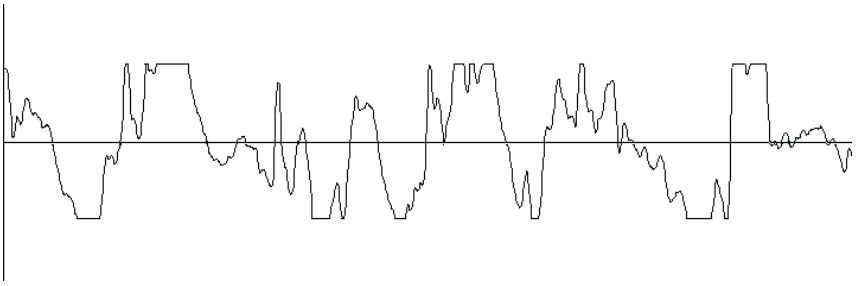
<table>
<tr><td></td><td>Assessment of glitches in the bass guitar</td></tr>
<tr><td>2</td><td>Any glitches, clicks or audible crossfades < ‘MS q1.wav’</td></tr>
<tr><td>1</td><td>Some glitches, clicks < B.
OR
Audible crossfades.</td></tr>
<tr><td>0</td><td>Intrusive glitches, clicks or crossfades >= candidate B.
OR
Extra notes after 45:3:3 or notes missing.
OR
Bar 41 changed.
OR
Not soloed.</td></tr>
</table>
Max 1 for clicks if distortion on the bass.
 

Award 1 mark if the candidate completed the correct pitch and rhythm for bars 44-45 using other sounds/synth.</td><td>5</td></tr>
</table>

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>2(a)</td><td>
<table>
<tr><th>Velocity in decimal</th><th>Velocity in binary</th></tr>
<tr><td>113</td><td>01110001</td></tr>
<tr><td>65 (1)</td><td>01000001 (1)</td></tr>
<tr><td>114 (1)</td><td>01110010 (1)</td></tr>
</table>
Allow rows to be swapped.
</td><td>4</td></tr>
</table>

Question Number	Answer	Mark
2(b)	Modulation/ CC1 (1) Damper / sustain / hold/ CC64(1) Pitchbend (1) Tempo (1) Time signature (1) Key (C major) (1) Text event (1) Track name (1) Instrument name (1) End position (1)	3

Question Number	Answer	Mark
2(c)	1 mark for each correctly assigned drum sound that plays the correct rhythm, in sync throughout. To award both the crash and the ride, they must be distinct and the crash more crash-like than the ride. Max 3 if there are additional drums. Max 4 is the drum kit is not acoustic. Max 4 for poor balance. If the drums are not soloed, or metronome is switched on, then assess what can be heard clearly.	5

Question Number	Answer	Mark
3(a)+(b)	Y-axis: Voltage / V / displacement (1) Allow volume / level / amplitude / dB Accept appropriate digital numbering: e.g. 0-65535 X-axis: m / cm / mm / s / ms / time (1) 2 marks for correctly clipped waveform 1 mark partially clipped waveform, e.g. not all peaks clipped, or some clipped peaks higher than others, out of phase/doesn't follow the original waveform closely 0 marks for a square wave or similar wrong waveform 	2+2

Question Number	Answer	Mark
3(c)	The dynamic range is reduced (1) Allow "compressed".	1

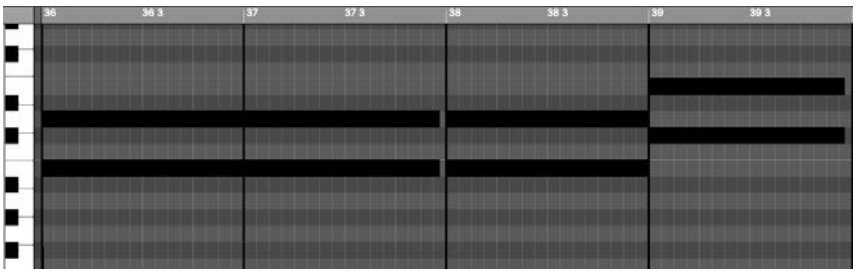
Question Number	Answer	Mark
4(a)(i)	Pitch Correction / Autotune / flex pitch / Melodyne (1) Not “pitchshift”.	1

Question Number	Answer	Mark
4(a)(ii)	(Unwanted) sonic material caused by editing / processing / digital process (1). A sound introduced that wasn’t in the original signal (1). Allow any explained reference to aliasing (1). Not noise picked up from capture.	1

Question Number	Answer	Mark
4(b)	Turn down headphones / monitoring (1) Use closed headphones (1) Ensure headphones are snugly fitted (1) In ear monitors (1) Not “ask singer to sing louder”. Not just “turn down volume”.	2

Question Number	Answer	Mark
4(c)(i)	**C** Sine	1

Question Number	Answer	Mark
4(c)(ii)	294*2 / 294+294 (1) 588 (Hz) (2) Award 2 for 588 with no working.	2

Question Number	Answer	Mark
(d)	Pitch: 1 mark for each correct pitch present in bar 36-39: D (1) B (1) in 36-38 E (1) C# (1) in 39 Sample editing: Sample sound is correct on all notes (1). Timing is correct, i.e. starts have been truncated correctly (1). Sample is correct note length on all notes and has no clicks or intrusive pitch bending that would be audible with lead vox present (1). Bars 40-43 have been copied from 36-39 (1). The lower vocal part must be panned left, the upper part must be panned right. (1) If the part is not soloed or the metronome is left on, then clicks cannot be assessed; timing and truncation can only be assessed if clearly audible. Award 1 mark if candidate completed the correct pitch and rhythm for bars 36-39 in all parts using other samples/sounds/vocoder.  	9

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>4(e)</td><td>1 mark for each feature to a maximum of 4 (AO3).

<table>
<tr><th>AO3</th><th>AO4</th></tr>
<tr><td>Cardioid (1)
Picks up sound from front (and sides) / rear rejection (1)</td><td>Less reverb / spill / noise (1)
Reduces feedback (1)
Some reverb picked up from the sides (1).</td></tr>
<tr><td>(Free field) mostly flat frequency response (1)</td><td>Condenser microphone because good high frequency response (1)
Little colouration of the source in the mid-range (1)</td></tr>
<tr><td>Pronounced low frequency boost in the near field / if mic is close (1)</td><td>Proximity effect (1).
Could be used to warm up vocals (1).
This boost is still significant in the mid-range which is the vocal range (1).
Could make vocals sound boomy (1).</td></tr>
<tr><td>(In the free field) the low frequency response tails off (1)</td><td>Reduce rumble (1)
Reduce plosives (1)
Vocals wouldn’t be too affected by the loss of low frequencies because it’s below the range of vocals (1).
Remove muddiness (1)
Allow HPF (1)</td></tr>
<tr><td>Increased sensitivity in the upper mids / high frequency (1)</td><td>Presence peak (1)
Adds brightness/clarity/air to vocals (1)
Could increase sibilance (1)
Bring vocals forward in the mix (1)</td></tr>
<tr><td>Dip in response higher than 16kHz (1)</td><td>Air band dip (1)
Very small / only by 3dB dip (1)
Right on the extremity of human hearing so may not even be audible (1).</td></tr>
<tr><td>Graph accurate to +/- 2dB (1)</td><td>Measurement error of testing equipment (1)</td></tr>
</table>
</td><td>8</td></tr>
</table>

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>5(a)</td><td>Bar 11 is a good place to listen.
<table>
<tr><th></th><th>Management & control of vocal reverb</th></tr>
<tr><td>3</td><td>Vocal reverb is similar to ‘MS q5 mixed.wav’</td></tr>
<tr><td>2</td><td>Use of reverb with some misjudgements, e.g. too wet/dry
OR
Reverb bypassed in some parts of the track</td></tr>
<tr><td>1</td><td>There is vocal reverb but:
Reverb affects guitar or bass
OR
A serious misjudgment</td></tr>
<tr><td>0</td><td>There is no audible evidence of reverb on the vocal.
No mix present on CD.</td></tr>
</table></td><td>3</td></tr>
</table>

Question Number	Answer	Mark
5(b)	Mono delay (1) Semiquaver feel delay time (1) Send amount ≈30%-100% and feedback≈30% (1) Max 2 if: • delay is not present throughout • delay is not present on the snare. Max 1 if delay affects other parts.	3

Question Number	Answer	Mark
5(c)	Bar 10 is a good place to listen. Mono tremolo (1) ≈Triplet quaver feel tremolo (1) Depth of effect matches bar 4 tremolo (1) Max 2 if: The effect is not present throughout. OR There are glitches / audible join either side of bar 4. OR Bar 4-5 has double the amount of tremolo because the candidate’s tremolo hasn’t been bypassed in bar 4-5. Max 1 if there are other effects.	3

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>5(d)</td><td>Listen to 1:02-1:06.

<table><tr><th></th><th>Management & control of vocal gating</th></tr><tr><td>3</td><td>Keyed gate:
Vocal plays simultaneously with the bass and the reverb isn’t gated.</td></tr><tr><td>2</td><td>Keyed gate:
The rhythm is correct, but gated vocal too short.
OR
Audible join when gate is bypassed at 33-34 or 35-36.
OR
Reverb is gated.
OR
Release too long.</td></tr><tr><td>1</td><td>Keyed gate:
BUT
Other bars are affected
OR
Incorrect rhythm</td></tr><tr><td>0</td><td>There is no audible evidence of keyed gating on the vocal.
No mix present on CD.</td></tr></table></td><td>3</td></tr>
</table>

Question Number	Answer	Mark
5(e)	This is best heard in bar 20. Distortion (1) distortion matches bar 43 (1) Pitchshift up an octave (1) Balance and pan of dry and effected signal match bar 43 (1) 20-42 affected (1) No clicks, glitches or volume changes at the end of bar 19 or end of bar 42 AND candidate distortion does not double up in bar 43 (1) If distortion isn’t panned hard enough and dry isn’t in the centre as two separate signals, then only award distortion and distortion amount.	6

Question Number	Answer	Mark
5(f)		3

	Balance and blend On CD ROM: Guitar quietest Vocals moderate Bass loudest
3	Balanced and blended across all parts of the mix. Vocals blend with guitar.
2	Most tracks are balanced with some masking. A few misjudgements, e.g. guitar too quiet.
1	Balanced so that one track is barely audible, or one track is too dominant. E.g. 'MS q5 unbalanced' OR Additional tracks. OR Volumes of tracks are erratic OR Parts are missing in sections IGNORE previously assessed work: e.g. wrong drums, wrong backing vocals
0	No mix on CD OR One track missing

Question Number	Answer	Mark
5(g)		

	Presentation of mix
3	Beginning and end of mix does not cut out music or tails. The beginning and end have less than 1 second of silence. The mix output is near normalised with no distortion.
2	Beginning and end of mix do not cut out. The beginning and/or end have a silence of greater than one second. OR The mix output is too low OR is compressed OR there is some slight distortion OR is louder than “q5 mixed”. OR Cut delay/reverb/drum tail before 47:1.
1	Obviously chopped start or ending (not including tails). OR The mix output is unacceptably low or too high (distorted) OR excessive use of mix compression causes pumping OR Metronome has not been turned off. OR Any part is noticeably out of sync (including backing vocal sync) / out of tune / missing OR Any additional intrusive processing / panning IGNORE previously assessed work: e.g. backing vocals incorrect stereo tremolo on the guitar bass incorrect at 44-45
0	No mix present on CD.

Question Number	Answer	Mark
6	**AO3 (5 marks)/AO4 (15 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. Responses that demonstrate only AO3 without any AO4 should be awarded marks as follows: • Level 1 AO3 performance: 1 mark • Level 2 AO3 performance: 2 marks • Level 3 AO3 performance: 3 marks • Level 4 AO3 performance: 4 marks • Level 5 AO3 performance: 5 marks **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include:	20

AO3	AO4
LFO	
Low frequency oscillator.	
	Delay time is the time before the LFO is applied / LFO starts instantaneously on every note.
Rate is the frequency of the LFO. Hz.	Below 20Hz.
	LFO always applied, not via mod wheel.
DCO	
Digital controlled oscillator.	Stable pitch.
Vibrato.	Some vibrato could be added to create more movement.
Pulse wave on. Pulse width modulation.	LFO assigned to pulse width modulation. Give some movement to the sound / stop pad sounding static / accept flange/chorus/detuning. The LFO is on medium so the pulse width modulation would be a similar rate to a string section playing vibrato.
Saw wave off.	If this was switched on, there would be more power / thicker.
Sub oscillator adds an octave below. Square wave sub oscillator.	This would give the pad more weight, filling the mix. Cause low mid congestion / clash with the bass.
White/pink noise.	Unpitched. A little white noise would be good for a pad. Some white noise could have made the pad more 'breathy'/gritty/thicken.
HPF	
High pass filter / cuts low frequencies / low cut filter.	HPF off preventing the pad sounding thin. (Turning up HPF) to thin the pad would reduce low mid congestion.
VCF	
Voltage controlled filter.	
Low pass filter / LPF. Cutoff frequency.	Remove the high frequencies. Warmer / less harsh. A less bright sound would sit further back in the mix.
Resonance.	The high resonance will emphasise the (cutoff) frequency. High resonance will emphasise movement in the filter. This could be intrusive in a busy mix because a pad should sit behind the other mix elements.
Filter envelope invert switch.	Positive. The cut off frequency will slowly rise instead of falling, giving it a softer attack.
Envelope.	There will be evolution in the filter, adding movement. The cutoff frequency will change (throughout each note).
Low frequency oscillator.	There will be no cyclic modulation in the filter cutoff. Some LFO could be added to the filter to give more movement.
Kybd is filter keyboard tracking.	The filter cutoff frequency rises with pitch, so that higher notes do not become dull. (Allow reference to velocity sensitivity to the filter).
VCA	
Voltage controlled amplifier.	The envelope doesn't affect volume / envelope is bypassed / would begin at full volume (although it may sound quieter because the filter cutoff is low). Sudden start/end would be inappropriate for a soft pad. Release is ignored.
ENV	

Envelope. Attack, decay, sustain, release.	The long attack means that the cutoff (accept volume) would start low and gradually rise. The long decay means that the cutoff (accept volume) would then fall slowly (to the sustain level). The low sustain level means that note ends would be dull (accept quiet/silent). Medium release mean that the cutoff (accept volume) would fade. Long attack/release suitable for sustained chords.
CHORUS	
	Chorus makes detuned/vibrato/phase copies of the original sound. Ensemble effect / thicker texture / warm. Chorus would add further movement to the sound to prevent it sounding static. Stereo. Mode II is more intense.
Analogue	
Analogue.	Description of analogue character, e.g. warm / phat filter. Smooth movement of LFO, filters and pulse width.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–4	• Demonstrates limited knowledge and understanding of production techniques/technology used, some of which may be misunderstood or confused. (AO3) • Shows limited analysis and deconstruction of production techniques/technology used with little attempt at chains of reasoning. (AO4) • Makes limited evaluative and/or critical judgements about the production techniques/technology used. (AO4) • Makes an unsupported or generic conclusion, drawn from an argument that is unbalanced or lacks coherence. (AO4)
Level 2	5–8	• Demonstrates knowledge and understanding of production techniques/technology used, which are occasionally relevant but may include some inaccuracies. (AO3) • Shows some analysis and deconstruction of production techniques/technology used with simplistic chains of reasoning. (AO4) • Makes some evaluative and/or critical judgements about the production techniques/technology used. (AO4) • Comes to a conclusion partially supported by an unbalanced argument with limited coherence. (AO4)
Level 3	9–12	• Demonstrates clear knowledge and understanding of production techniques/technology used, which are mostly relevant and accurate. (AO3) • Shows clear analysis and deconstruction of production techniques/technology used with competent chains of reasoning. (AO4) • Makes clear evaluative and critical judgements about the production techniques/technology used. (AO4) • Comes to a conclusion generally supported by an argument that may be unbalanced or partially coherent. (AO4)
Level 4	13–16	• Demonstrates detailed knowledge and understanding of production techniques/technology used, which are relevant and accurate. (AO3) • Shows detailed and accurate analysis and deconstruction of production techniques/technology used, with logical chains of reasoning on occasion. (AO4) • Makes detailed and valid evaluative and critical judgements about the production techniques/technology used. (AO4) • Comes to a conclusion, largely supported by a balanced argument. (AO4)
Level 5	17–20	• Demonstrates sophisticated and accurate knowledge and understanding of production techniques/technology used throughout. (AO3) • Shows sophisticated and accurate analysis throughout, and deconstructs production techniques/technology used with logical chains of reasoning throughout. (AO4) • Makes sophisticated and valid evaluative and critical judgements about the production techniques/technology used. (AO4) • Comes to a rational, substantiated conclusion, fully supported by a balanced argument that is drawn together coherently. (AO4)

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom