Mark Scheme (Results)

November 2021

Pearson Edexcel GCE
Music Technology (9MT0)
Paper 4: Producing & Analysing

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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.

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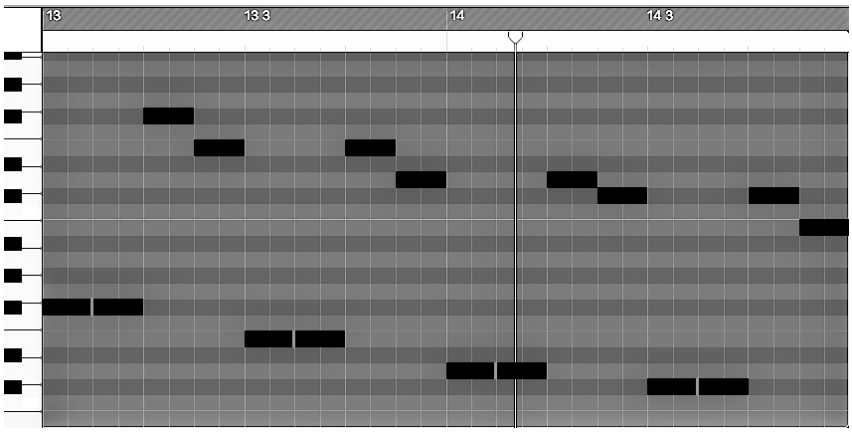
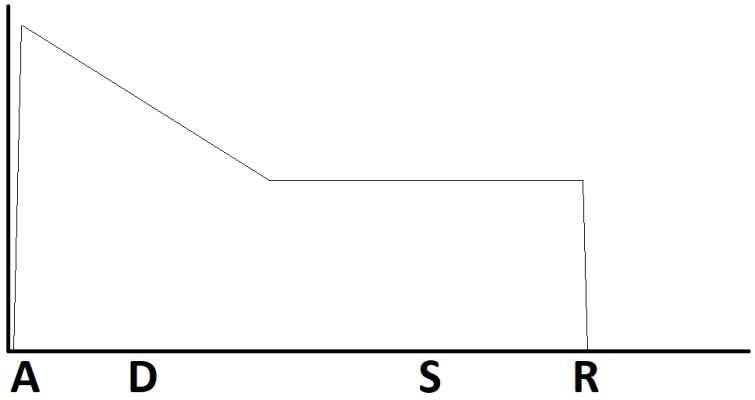
Question Number	Answer	Mark
1(a)	**B** 1/16 A is incorrect because 1/32 could move some notes more out of time. C is incorrect because the rhythm isn't triplets. D is incorrect because this would turn the semiquavers into quavers.	1

Question Number	Answer	Mark
1(b)	**C** 12 semitones A is incorrect because the pitch bends down an octave, not a tone. B is incorrect because the pitch bends down an octave, not a perfect fifth. D is incorrect because the pitch bends down an octave, not two octaves.	1

Question Number	Answer	Mark
1(c)(i)	<table><tr><th>Bar</th><th>Beat</th><th>Div</th><th>Tick</th></tr><tr><td>*14*</td><td>**1** (1)</td><td>**3** (1)</td><td>*161*</td></tr></table>	2

Question Number	Answer	Mark
1(c)(ii)	 1 mark for each correct beat.	4

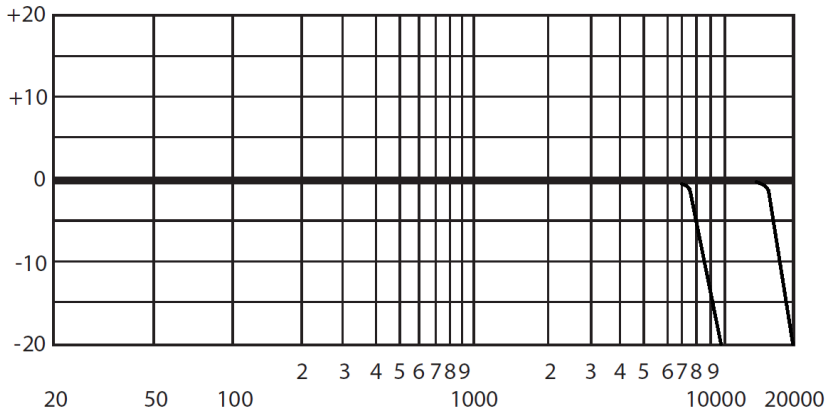
Question Number	Answer	Mark
1(d)	(i) Time/s/ms (1) Amplitude/volume/dB/gain (1) (ii) Attack almost instant or instant (1). Decay must decay in some way (1). Sustain could be any length, but must be flat and equal/ lower to what is shown in the diagram below (1). Release almost instant or instant (1). (iii) 1 mark for ADSR correctly labelled (1)  	7

Question Number	Answer	Mark
1(e)	QP: Bass shifted late 1 semiquaver + 50ish ticks 'MS q1.wav' shows the edit for full marks. The bass is in time during 23-24. (1) The bass is in time throughout all bars (1) The bass is playing the correct rhythm, including pitch bends in 23-24 (1) There are no glitches/changes in level at bar 23. Slight glitches must be quieter or equal to X (1) There are no glitches/changes in level at bar 25. The bar 25 bass note has been replaced. Slight glitches must be quieter or equal to Y (1) If the bass is not soloed/ metronome left on, only assess timing. If incomplete bass track bounced, assess from Q5 mix audio; max 1 mark.	5

<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>98</td><td>01100010</td></tr>
<tr><td>99 (1)</td><td>01100011 / 1100011 (1)</td></tr>
<tr><td>95 (1)</td><td>01011111 / 1011111 (1)</td></tr>
</table>
</td><td>4</td></tr>
</table>

Question Number	Answer	Mark
2(b)	With 7 bits, this means that there are 7 0s and 1s (1) 127 is 1111111 in binary (1). 2x2x2x2x2x2x2 / 2^7 =128 (1). There are 128 combinations of 7 0s and 1s (1). (0 is a value too which is why) the range is 0-127, not 1-128 (1). For a value greater than 127, another bit would be required (1).	2

Question Number	Answer	Mark
2(c)	1 mark for each correctly assigned drum sound that plays the correct rhythm, in sync throughout. Max 3 if there are additional drums. Max 4 if the kick, hats and snare are acoustic. Max 4 if the kit is unbalanced. Max 4 if the kick and snare are off centre. 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) Low pass / high cut (filter) (1). (b) Frequency/Hertz/Hz (1) Amplitude/volume/dB/gain (1) (c) Cutoff marked between -1dB and -5dB. (d) **Curve:** LPF (1) **Slope:** LPF is steep, not vertical curve that is steeper than 45º AND hits -20,with no resonance (1) (don't allow HPF) **Frequency:** LPF starts on x-axis 2kHz-10kHz (1) Max 1 if any additional boosts or cuts. 	7

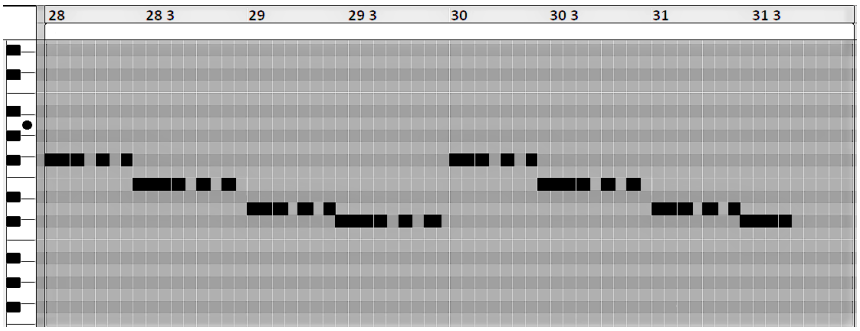
Question Number	Answer	Mark
4(a)	Hiss (1). Warm [accept any similar analogue descriptor] (1). Wow and flutter (1).	1

Question Number	Answer	Mark
4(b)	**D** Lossy compression (1) A is incorrect because bit crusher is an effect, not a form of data compression. B is incorrect because dynamic compression isn't a form of data compression. C is incorrect because AAC isn't lossless compression, it's lossy compression.	1

Question Number	Answer	Mark
4(c)	Smaller file size (1). Quicker upload/download speed/easier to stream (1).	1

Question Number	Answer	Mark
4(d)	**D** 256 kbps A is incorrect because 1kbps would create indecipherable noise. B & C are incorrect because there would be significant artefacts added to the audio file.	1

Question Number	Answer	Mark
4(e)	‘MS q3.wav’ shows the correct removal of noise. Mark: Removing noise in vocal at 0:05 and 0:40 3: Hiss and breath in bar 3 an 18 has been removed without cutting any of the words and no glitches. Similar to ‘MS q3.wav’ 2: Slight transient noise or glitches in either bar 3 or 18. 1: Intrusive longer noise or glitches in either bar 3 or 18. OR Parts of vocal cut out in either bar 3 or 18. OR Not soloed/metronome left on. 0: No attempt to cut out noise or a completely silent track.	3

Question Number	Answer	Mark
4(f)	Listen to 1:04. **Pitch and rhythm:** Bar 28: Correct rhythm, including the early beat 3 (1). F# (1) E (1) D (1) C# (1) Bars 30-31 are the same bar 28-29 of candidate's work (1). **Sample editing / pitch manipulation:** It has been edited with no clicks, has not been cut off and no timing issues due to the edits not being tight (1). No intrusive changes of pitch where pitch isn't been tracked accurately and panned hard left (1). Allow artefacts/change of tone caused by pitch processing. If not soloed, then assess pitch and rhythm but not sample editing. **Award 1 mark if candidate completed the correct pitch and rhythm for bars 36-39 in all parts using other samples/sounds.** 	8

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>4(g)</td><td>1 mark for each feature to a maximum of 4 (AO3). 1 mark for each analysis to a maximum of 4 (AO4).
e.g.
<table>
<tr><th>AO3</th><th>AO4</th></tr>
<tr><td>High ratio / ratio higher than 4:1 (1) low threshold (1)</td><td>Heavy compression (1).
Increases breath noise (1).
Increases reverb (1).
Increases hiss (1).
Controls wide dynamic range of vocal (1). For example “before” is brought up to match other words (1).
Helps vocal sit with narrow dynamic range of electronic backing track (1).
Increases average volume (1).
Increases RMS volume (1).</td></tr>
<tr><td>High gain make up (1)</td><td>To compensate for high gain reduction (1)</td></tr>
<tr><td>Attack slow (1)
Opto compressor (1)</td><td>Some transients aren’t fully controlled (1), e.g.”only”, “even”, “argue” (1).</td></tr>
<tr><td>Release fast (1)</td><td>Pumping (1) of reverb (1).</td></tr>
<tr><td></td><td>Slight distortion (1) Slightly brighter (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>Listen to the bass at 1:02 (just before second chorus)
<table>
<tr><th></th><th>Management & control of the bass panning automation</th></tr>
<tr><td>2</td><td>L – R as directed</td></tr>
<tr><td>1</td><td>R – L
OR
C – R
OR
L – C
OR
Not hard panned similar to X.
OR
Glitch / click on the edit</td></tr>
<tr><td>0</td><td>Erratic panning
AND/OR
Bass panned in a single position other than centre.
AND/OR
Bass does not reset to centre in bar 28.
AND/OR
Bass panned but other parts panned noticeably off-centre
OR
There is no audible panning automation on the bass.
OR
No mix present on CD.</td></tr>
</table></td><td>2</td></tr>
</table>

Question Number	Answer	Mark
5(b)	Distortion has been used (1) Drive and tone matches bar 32 (1) Level matches bar 32 (1)	3

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>5(c)</td><td>Listen to synth chords throughout.

<table><tr><th></th><th>Management & control of synth chords gating</th></tr><tr><td>3</td><td>Keyed gate:
Synth chords only play simultaneously with the bass.</td></tr><tr><td>2</td><td>Keyed gate:
The rhythm is correct, but gated synth chords too short or release too long / fades.
OR
The rhythm is correct, but glitches.</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 synth chords.
No mix present on CD.</td></tr></table></td><td>3</td></tr>
</table>

Question Number	Answer	Mark
5(d)	Listen to “coffee” at 0:16. Delay/reverb has been used (1) Delay is 1/4 note (1) Delay is one repeat and wet is quieter than dry (1) Reverb is added to the wet signal, not the dry signal (1). Reverb time is >4s and high send amount (1).	5

Question Number	Answer	Mark
5(e)	Listen to “head” at 1:01. The vocal has been extended in bar 26 (1). The pitch is C# (1). There are no clicks or glitches (1). The “D” of “head” is present (1). The “D” of “head” is at the start of bar 27 (1).	5

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>5(f)</td><td>On CD ROM:
bass quiet
vocals quiet
synth chords are loudest
drums are MIDI
<table>
<tr><td></td><td>Balance and blend</td></tr>
<tr><td>3</td><td>Balanced and blended across all parts of the mix. Vocals sit on top of mix and synth chords are equal or louder than candidate X.</td></tr>
<tr><td>2</td><td>Most tracks are balanced with some masking. A few misjudgements, e.g. bass under / drums under</td></tr>
<tr><td>1</td><td>Balanced so that one track is barely audible. E.g. chords <= ‘2020 MS task 3 unbalanced’.
OR
Not all of a track present affecting balance
OR
Additional tracks.
OR
Erratic volume changes.</td></tr>
<tr><td>0</td><td>No mix on CD
OR
Not all tracks present</td></tr>
</table>
Ignore previously assessed work e.g. synth chords gating, …</td><td>3</td></tr>
</table>

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>5(g)</td><td>
<table>
<tr><th></th><th>Presentation of mix</th></tr>
<tr><td>3</td><td>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.</td></tr>
<tr><td>2</td><td>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/bass tail
OR
Slightly out of sync drums by the end because tempo is incorrect by <1bpm</td></tr>
<tr><td>1</td><td>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 / out of tune / missing
OR
Any additional intrusive processing / EQ

IGNORE previously assessed work:
e.g. bass out of sync in bars 23-24</td></tr>
<tr><td>0</td><td>No mix present on CD.</td></tr>
</table>
</td><td>3</td></tr>
</table>

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. *Don't double credit points in italics.* Relevant points may include:	20

AO3	AO4
Figure 1 (multi-mic)	
Acoustics	
Large room.	Long pre-delay on reverb.
Some exposed concrete surfaces. Wooden floor. No acoustic treatment. Glass window.	Increase reverb. Not attenuating any specific frequencies e.g. bass trap. No diffusion.
Angled ceiling. Angled glass window.	Helps reduce standing waves.
Drummer facing away from control room window.	Live performance with band in the room. Difficult to communicate with the engineer in control room.
Carpet on the floor.	Absorb / stop reflections. Mostly high frequency absorption because not very thick.
Headphones.	Monitoring. Reduce spill from other instruments.
	Cables should be taped down to avoid trip hazard.
	Fairy lights may buzz.
Microphones	
Distance room mic (on far left of picture).	Captures the reverb/ambience of the room. There could be two to create stereo.
Pair of mics in front of kit. Placed in line with the toms. Spaced pair.	*Stereo. Overall picture of kit. Some reverb would be captured.* Gives a balanced picture of the kit/not cymbal heavy. Wide picture.
Overheads. X-Y pair.	*Stereo. Overall picture of kit. Some reverb would be captured.* Phase problems less likely than with a spaced pair.
Bass drum mic inside the drum.	Captures attack of beater hitting the skin. *Close mic. Less reverb.*
Snare drum has two mics.	One mic for capturing the top skin. One mic for capturing the rattle/snare. Top and bottom skin mic placement particularly prone to phase problems. *Close mic. Less reverb.*
One mic on each tom. *Dynamic microphone.* *Accept: Condenser microphone.*	*Close mic. Less reverb.* Microphones are front/end address (so are pointing in the correct direction). Accept: microphones are side address so are pointing in the wrong direction.
One mic on each cymbal.	*Close mic. Less reverb.*
High hat mic. Small diaphragm.	Not too close to avoid proximity effect / low frequency exaggeration. Above hi-hat to prevent air blasting. Good high frequency response.
Mic on amp. Not plugged in.	Probably not in use. If amps turned on they could generate background noise. Accept: amp could spill on to drum mics.
Mixing	
	More control over balance. *More control over EQ/compression/processing/FX on each drum.* Maybe not all mics used in mix.

AO3	AO4
Figure 2 (three mics)	
Acoustics	
Soft wall treatment. Small room. Drum kit in the corner.	Absorbs sound. Absorbs mid and high frequencies/ doesn't control bass frequencies. Dry/dead recording. Usually for this setup type (Glyn Johns) it would be in more reflective/large space. Short pre-delay. Accentuates low frequencies. Leads on the wall could rattle.
Microphones	
Glyn Johns technique.	
The side mic is close to the wall. The side mic is close to (floor) tom.	This could change the polar response. This could change the frequency response. Destructive interference/comb filtering from reflections. Too much tom could be picked up.
Overhead mic.	Correctly placed.
The side mic is closer to the snare than the overhead mic.	Mics should be equidistant from the snare. Delay between two mics. Phase problems. Comb filtering.
Bass drum mic outside of drum. Bass drum mic not in front of hole.	Sound would lack attack. Prevents air blasting. Large diaphragm for low frequency response.
Mixing	
	Pan the side and overhead mic to create stereo.
Fewer mics.	Fewer tracks in 1960s. *Less control over balance.* *Less control over EQ/compression/processing/FX on each drum.*

Both drummers	
Microphones (must be related to correct drum to be credited)	
Multiple microphones.	Phase needs to be checked between microphones. Phase problems solved by polarity/phase button on desk. Phase problems solved by moving microphones.
Condenser microphone.	Brighter / better high frequency response.
Dynamic microphone.	Cope with high SPL. Slow transient response. Helps control loud transients.
Shock mounts/cradle.	Reduces mechanically transmitted noise / rumble / vibrations.
Mics placed where they won't be hit.	
XLR / balanced cables.	Less noise. Long cable runs.
Moongel/ gaffa tape on the skins. Duvet in kick drum.	Reduces resonance/sustain.

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)