Pearson Edexcel

Mark Scheme (Results)

Summer 2022

Pearson Edexcel GCE

In Music Technology (9MT0)

Paper 4 Listening and analysing

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Summer 2022
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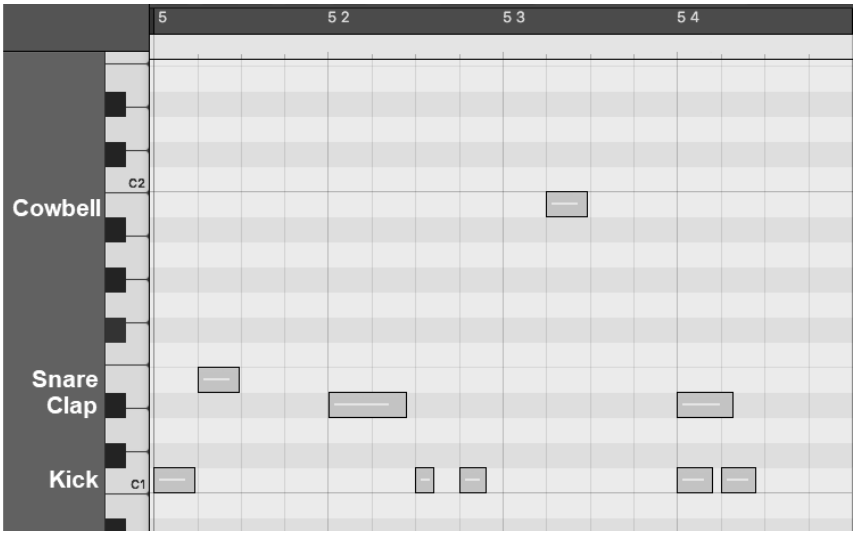
General Marking Guidance

- 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.

Question Number	Answer	Mark
1(a) Type 4	**A** 1980s drum machine B, C, D are incorrect because they are acoustic kits. It is an electronic kit on the recording.	**(1)**

Question Number	Answer	Mark
1(b) Type 4	**A** 1/64 B, C, D are incorrect because the smallest note value is 1/64 in the hi-hats.	**(1)**

Question Number	Answer	Mark
1(c) (i) Type 1	1 mark for each correct rhythm: kick on C clap on D# snare on E Cowbell on B  	**(4)**

Question Number	Answer	Mark
1(c) (ii) Type 1	One shot samples (1) Note off ignored (in drum samples) (1) The length is governed by the envelope not the MIDI data (1) NOT "drum sounds are short"	**(1)**

Question Number	Answer	Mark
1(c)(iii) Type 3	7 (1) 7 bits (1) Seven (1) Seven bits (1) Allow: 8 (1) 8 bits (1) Eight (1) Eight bits (1) Accept either 7 and/or 8 in a sentence.	**(1)**

Question Number	Answer	Mark
1(c) (iv) Type 3	1100010 (1) 01100010 (1) There might be some working out that needs to be ignored. Just mark the final answer which should be as above.	**(1)**

Question Number	Answer	Mark
1(d) (i) Type 4	**A** Bit crusher B, C, D are incorrect because these types of distortion would not create the digital pitched artefacts.	**(1)**

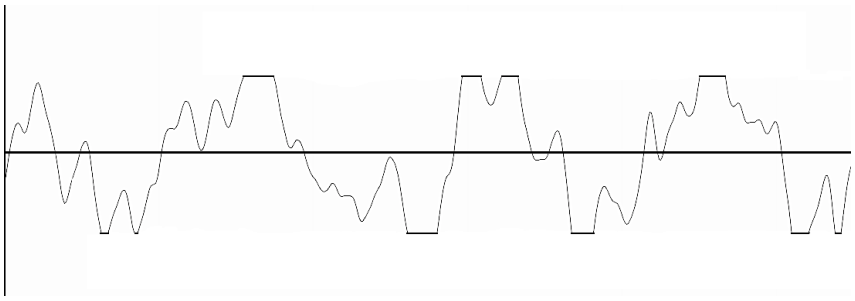
Question Number	Answer	Mark
1(d) (ii) Audio examiner	All noise removed from bars 16-19 and the drums are in time (1) Drums replaced with correct pattern in bars 15-16 (1) Drums replaced with correct pattern in bars 17-18 (1) Bar 19 is a single kick and hi-hat (1) The edit points have no click/glitch (1) e.g.: • end of 15 [only award if noise is fully removed from the end of bar 15] • 19:1:2:1 on bass drum edit • 20:1:1:1 Max 2 if further errors introduced to the drum part, e.g. 12-15 missing, bar 20 onwards out of sync If the part is not soloed or the metronome is left on, then clicks cannot be assessed; patterns can only be assessed if clearly audible.	**(5)**

Question Number	Answer	Mark
2(a) **Type 1**	It would sound tinny/thin/quiet (1) Bass/low frequencies wouldn't be reproduced (1) Below 100Hz-800Hz (1) Extra distortion could be introduced (1) No woofer / small speaker (1) Designed for human voice (1) The distortion on the original track creates mid/high frequencies (1) There are some mid/high frequencies that could be reproduced (1) Allow: Mono (1)	**(3)**

Question Number	Answer	Mark
2(b) **Type 1**	Release too short / 0ms (1) Cuts waveform mid-cycle / cuts waveform when it's not at 0 displacement / credit a diagram showing waveform cut mid-cycle (1)	**(2)**

Question Number	Answer	Mark
3(a) (i) Type 4	**B** Compressor A is incorrect because chorus doesn't increase sustain C is incorrect because there is no reverb on the piano D is incorrect because there is no cyclic change of volume	**(1)**

Question Number	Answer	Mark
3(a) (ii) Type 4	**A** Chorus B is incorrect because compression doesn't detune C is incorrect because there is no reverb on the piano D is incorrect because there is no cyclic change of volume	**(1)**

Question Number	Answer	Mark
3(a) (iii) Type 1	Y-axis: Voltage / V / displacement (1) Allow volume / level / amplitude / dB Accept appropriate digital numbering: e.g. 0-65535 X-axis: 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 	**(4)**

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>3(b)
Audio examiner</td><td>
In order to assess, ensure that the candidate's response is the same volume as the comparison tracks.

<table>
<tr><td></td><td>Compression</td></tr>
<tr><td>2</td><td>Piano has sustain similar to as MS q3.wav</td></tr>
<tr><td>1</td><td>Piano has more sustain than piano.wav
OR
Distortion isn't present throughout the sustain.</td></tr>
<tr><td>0</td><td>No clearly audible compression</td></tr>
</table>

<table>
<tr><td></td><td>Chorus</td></tr>
<tr><td>2</td><td>Piano has stereo and subtle detuning similar to MS q3.wav</td></tr>
<tr><td>1</td><td>Chorus is too deep / flange
OR
Chorus applied but mono signal
OR
Shifts pan position</td></tr>
<tr><td>0</td><td>No clearly audible chorus</td></tr>
</table>

<table>
<tr><td></td><td>Distortion</td></tr>
<tr><td>2</td><td>Piano is distorted similarly to MS q3.wav, i.e. distorted on the peaks but less so at the end of the sustain.</td></tr>
<tr><td>1</td><td>Distortion is too heavy/soft
OR
Too bright/dull
OR
Distortion isn't present throughout the sustain.</td></tr>
<tr><td>0</td><td>No clearly audible distortion</td></tr>
</table>

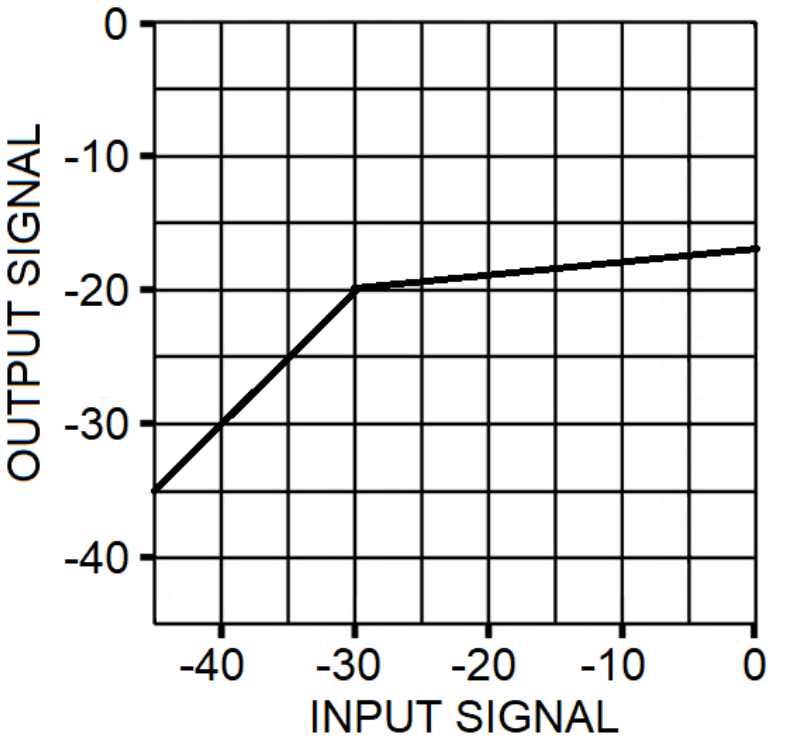
No intrusive clicks, glitches or volume changes at bar 6 AND candidate effects do not affect bars 4-5 AND no intrusive effects [allow some reverb] (1)

Award 0 for copy and pasted bars 4-5.

If no soloed, then max 1 for each of compression, chorus, distortion and then 0 for clicks/glitches.
</td><td>(7)</td></tr>
</table>

Question Number	Answer	Mark
4(a) (i) Type 1	Control the peaks (1) Keep volume consistent (1) Increase average/RMS level (1) Help vocal sit in the mix (1) NOT: reference to dynamic range because it's in the question.	**(1)**

Question Number	Answer	Mark
4(a) (ii) Type 1	Increase noise (1) Increase volume of breaths (1) NOT plosives More reverb (1) Increases sibilance (1) NOT: Lifeless / Pumping / Squashed / references to dynamics	**(1)**

Question Number	Answer	Mark
4(a) (iii) Type 1	 x-axis labelled dB (1) y-axis labelled dB (1) 1:1 line from y-axis to -30 input (1) [threshold mark] 10:1 line is flatter than the 1:1 line (1) [so any type of compression curve at least scores 1] 10:1 line from knee to 0 input (1) [accept any sloped line that fits within one box] Hard knee (1) Gain make up shown so that -30 input = -20 output (1) Allow kick at end of 10:1 line (as Logic shows). Award no marks if not a compression curve.	**(7)**

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>4(b)
Type 1</td><td>1 mark for each feature to a maximum of 4 (AO3). 1 mark for each analytic point (AO4).
Do not double credit repeats shown in italics.
Don't credit "High shelf EQ boost" because this is given in the question.
The AO3 and AO4 marks must be connected to the correct handheld mic or EQ. E.g. "Sibilance" must be connected to "High shelf EQ".
"Mic too close" must be linked to the AO3.
e.g.
<table>
<tr><th>AO3</th><th>AO4</th></tr>
<tr><td>Hand held microphone</td><td></td></tr>
<tr><td></td><td>Dynamic microphone (because handheld) (1)
Some vocal performers prefer handheld microphone / suits rap style (1)
Working the mic / closer and further away to control dynamics (1)</td></tr>
<tr><td>Cardioid (1)</td><td>Rejects reverb / noise (1)</td></tr>
<tr><td>Low frequency noise at the start (1)</td><td>Cable movement/vibration noise (1)
LF cut on EQ would remove this vibration (1)
Use a cradle (1)</td></tr>
<tr><td>Plosives (1)</td><td>Microphone too close / right up against mouth (1)
No pop shield (1)
SM58 built in pop shield (1) less effective because close to diaphragm (1)
LF cut would reduce plosives (1)</td></tr>
<tr><td>Low frequency heavy (1)</td><td>Microphone too close / right up against mouth (1)
Proximity effect (1)
LF cut would reduce proximity effect (1)</td></tr>
<tr><td>Headphone spill (1)</td><td>Increased with high shelf EQ boost (1)</td></tr>
</table></td><td></td></tr>
</table>

			Turn headphone volume (1)		
		Some reverb (1)	It must have been a very live room because microphone is so close (1)		
		High shelf EQ boost			
			Compensates for lack of high frequencies in dynamic microphone (1) Brighter/clearer/air (1) Cuts through mix (1) More sibilance / lip smacks (1) could be reduced by de-esser (1)		**(8)**

Question Number	Answer	Mark
4(c) (i) Type 4	**D** There is no significant difference in sound quality. A is incorrect because the file size increases. B and C are incorrect because the sound quality remains the same.	**(1)**

Question Number	Answer	Mark
4(c) (ii) Type 4	**D** Time stretch A is incorrect because this is used to tune parts. B is incorrect because the pitch of the song hasn't changed and the formants sound natural in the extract. C is incorrect because it's used to correct rhythmic errors.	**(1)**

Question Number	Answer	Mark
4(c) (iii) Audio examiner		

	Sample selection Whole phrase is present in 23, 27
3	'you without me' sample has been used throughout with: no instruments/drums present AND Pitch and rhythm are correct in chorus AND Sample triggers at correct time in verse
2	'you without me' sample has been used but: Instruments/drums OR Wrong pitch/rhythm in chorus
1	'you without' sample has been used throughout, but 'me' is missing
0	Wrong phrase used

	Pitch bend scratch effects 11:3:1-11:4:3 a good example of range on a long note; down an octave then back up to 0 19:1 a good example of range on a long note; down an octave
3	MIDI pitch bend matches MS q4.wav
2	MIDI pitch bend changes vox pitch with a wide pitch range
1	MIDI pitch bend changes vox pitch in some small way, i.e. 2 semitones
0	No MIDI pitch bend

Pitch & Rhythm (ignoring pitch bend/incomplete samples):
All pitches and rhythm are correct in bars 1-21 (1). [Bar 2-3 have no pitch bend to assess pitch without pitch bend present]
All pitches and rhythm are correct in bars 22-29 (1).

Sample editing:
No start/end clicks AND very short release AND stereo (1)
[note there is a glitch on “me” in the original sample]

****
****
If no marks are awarded above, award 1 mark if there has been an unsuccessful attempt at using the Ariana Grande song to play back the MIDI file or sample.

If q4.wav is incomplete, assess q5.

If the part is not soloed or the metronome is left on, then stereo/clicks cannot be assessed; timing and truncation can only be assessed if clearly audible.

Award 0 marks if candidate has used a MIDI timbre to play the MIDI file or Ariana Grande song not recognisable.

(9)

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>5(a)
Audio examiner</td><td>
<table>
<tr><td>Mark</td><td>Removing noise in vocal at 0:00-0:07.</td></tr>
<tr><td>2</td><td>Rumble and breaths in bars 1-3 has been removed without cutting any of the words and no glitches. Similar to ‘MS q5.wav’</td></tr>
<tr><td>1</td><td>Some noise is cut but:
Audible noise or glitches in bars 1-3.
OR
Parts of vocal cut out anywhere in the song.</td></tr>
<tr><td>0</td><td>No attempt to cut out noise.</td></tr>
</table>

Allow optional cut of breath in bar 4.

Award 0 if the vocal track is not loud enough to assess, or other parts are out of sync so mask the vocal track.</td><td>(2)</td></tr>
</table>

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>5(b)
Audio examiner</td><td>
<table>
<tr><td></td><td>Scratch vocal panning automation 0:57-1:04 (breakdown).</td></tr>
<tr><td>3</td><td>L – R as directed (allow tail if present at beginning of 21 to remain left musically)</td></tr>
<tr><td>2</td><td>R – L
OR
C – R
OR
L – C
OR
Audible moving panning of scratch vocal
OR
Not hard panned
OR
Glitch / click on the edit</td></tr>
<tr><td>1</td><td>Erratic panning
AND/OR
Scratch vocal panned in a single position other than centre.
AND/OR</td></tr>
</table>
</td><td></td></tr>
</table>

		Scratch vocal does not reset to centre in bar 23. AND/OR Scratch vocal panned but other parts panned noticeably off-centre	
	0	There is no audible panning automation on the scratch vocal. OR No mix present on CD.	**(3)**

Question Number	Answer		Mark
5(c) Audio examiner			
		Piano gating bars 12-18.	
	3	Keyed gate: Piano plays simultaneously with the kick, snare with every hit.	
	2	Keyed gate: Piano plays simultaneously with the kick, snare and clap but hi-hat/cow bell is also triggering the gate (low threshold). OR Piano plays simultaneously with the kick, snare and clap but some hits are missing (high threshold) or not clearly audible. OR The rhythm is correct, but glitches. OR Audible join when gate is bypassed at 11-12 or 18-19.	
	1	Keyed gate: BUT Other bars are affected OR Incorrect rhythm that isn't related to the drum part.	
	0	There is no audible evidence of keyed gating on the piano. No mix present on CD.	**(3)**

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>5(d)
Audio examiner</td><td>
<table>
<tr><td>Mark</td><td>Double tracking in vocal at 26-28.</td></tr>
<tr><td>2</td><td>There is a double tracked backing vocal on “stage fright” and “take flight” using phrases taken from earlier in the chorus or ADT effect. There are no clicks/ glitches. The backing vocals are the same volume or quieter than the lead vocal, and:
The parts are panned hard left and right.
OR
The parts are panned hard left then right.</td></tr>
<tr><td>1</td><td>An unsuccessful attempt at double tracking e.g.
Louder overall
OR
The lead vocal sounds panned to one side
OR
Wrong phrases used
OR
Wrong phrases double tracked
OR
Clicks/glitches present in double tracking.
OR
Backing vocals louder than lead vocals.
OR
Chorusing / flanging</td></tr>
<tr><td>0</td><td>No attempt to double track the rap.</td></tr>
</table>
</td><td></td></tr>
</table>

	<table><tr><td>Mark</td><td>Reverb on double tracking in vocal at 1:18 & 1:25.</td></tr><tr><td>2</td><td>Reverb similar to ‘MS q5.wav’ is on the double tracked backing vocals.</td></tr><tr><td>1</td><td>Reverb is on the backing vocal but: Reverb too wet OR Reverb too long OR Other phrases affected by reverb OR Only one phrase has reverb</td></tr><tr><td>0</td><td>No attempt to add reverb to the backing vocal</td></tr></table> There are stereo backing vocals present and the lead vocal is still present in the centre (1)	**(2)+(2)+(1)**

Question Number	**Answer**	**Mark**
5(e) Audio examiner	**Delay in bar 19.** Mono delay (1) crotchet delay time (1) Send amount ≈30%-90% and feedback≈60% AND no glitches/changes in volume/extra words (1) [should fill the gap before chorus] Delay is filtered with HPF/BPF/high shelf boost (1) Filter is HPF and cutoff matches ‘MS q5.wav’ (1) Max 2 if delay is present throughout. Max 1 if delay affects other parts.	**(5)**

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>5(f)
Audio examiner</td><td>On CD ROM:
bass quiet
vocals
piano loud
drums
scratch vocal is MIDI samples
<table>
<tr><th></th><th>Balance and blend</th></tr>
<tr><td>3</td><td>Balanced and blended across all parts of the mix. Vocals sit on top of mix and bass is similar to ‘MS q5.wav’</td></tr>
<tr><td>2</td><td>Most tracks are balanced with some masking. A few misjudgements, e.g. bass under / piano over</td></tr>
<tr><td>1</td><td>Balanced so that one track is barely audible. E.g. bass <= ‘MS q5 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. piano gating</td><td>(3)</td></tr>
</table>

<table>
<tr><th>Question Number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>5(g)
Audio examiner</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 “MS q5 mixed”.
OR
Cut vocal/bass tail</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. Vocal delay, drum edit</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 Type 1	**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** Do not double credit repeats shown in italics. 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
Compressor	
Compressor is first in the chain. Reduces dynamic range.	Prevents clipping of EQ pedal. One compressor knob gives easy application of compression. One compressor knob controls ratio / threshold / make-up gain. Adds sustain. Compression for slap bass.
EQ	
Graphic EQ. 7 bands. *Affects volume of different frequencies.*	In a performance situation, a good visual representation of the EQ curve.
Low frequencies boosted.	Could make the bass boomy/muddy. Large (overall) level increase. Could cause distortion. Could mask kick drum.
High frequencies cut.	Removes hiss. Hiss would be increased by the distortion. Removes attack/pluck. Removes fret noise. The bass will sound dull/muffled/warm. If slap technique used, timbre would be adversely affected.
(Level)	Unity gain. Level should be reduced to compensate (for increase in bass level). Compressor after EQ would control level increase.
Overdrive	
<u>Gain</u> adds distortion.	(High gain) very distorted. Adds harmonics. Adds higher frequencies / brighter. Gritty / grungy / dirty / harsher. Restores brightness/HF removed by EQ. (High gain) distortion unusual in funk.
Balance controls <u>wet</u>/dry mix.	There will be unprocessed/dry signal present alongside the distorted signal. Dry signal helps clarity of low frequencies. Common in bass guitar pedals to have both dry and distorted signal present while this would be unusual in electric guitar pedals.

EQ *affects volume of different frequencies.* Two band EQ. Low frequencies. High frequencies. Shelving.	Flat / EQ makes no difference. EQ shapes the signal after distortion. Reduction of high frequencies could reduce harshness of distortion. Reduction of high frequencies could emulate a speaker cabinet.
(Level) Output.	Distortion effect increases level. Level should be reduced to compensate. When pedal is bypassed there will be a drop in volume. High level would overload the dynamic wah.

Dynamic wah	
Band pass filter / low pass filter.	Wah is common in funk.
Attack is the time taken for the cut off frequency to rise.	Gradual wah effect on each note. Rising of cut off frequency / sweeping filter.
Freq is the cut off =frequency.	The starting cut off frequency before the filter opens. A medium setting means the starting cut off frequency will be in the range of most bass notes. Beginnings of notes won't be so heavily filtered that they don't sound.
Sens is the sensitivity to volume.	A medium setting means that most notes will have wah effect. Quiet notes may not trigger the wah. Depends on how hard the player hits strings
Incorrectly plugged in to guitar socket.	Not suited to bass guitar. Affects frequency response. Affects the frequency range of the wah effect. Could be deliberate to process more mid-high frequencies. Suitable for slap/funk.
Auto wah effect.	Nothing plugged into the expression pedal socket so there will be no manual control of the frequency.
	Wah after distortion in chain so wah filter works on distorted signal. Broad frequency range so wah filter has greater effect.

	Allow: EQ mids cut so wah less effective.
Cables/pedals	
Jack / TS. 1/4inch.	
Unbalanced.	Prone to hum/noise.
Short.	Reduces hum/noise.
Overdrive/EQ bypassed.	Pedals may be engaged or bypassed at any point in the performance.
	Signal flow starts with processing, then effects.
Output/effected signal sent to amp or DI.	

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)