

Mark Scheme (Results)

Summer 2014

GCE Music Technology (6MT04/01)
Paper 1: Analysing and Producing

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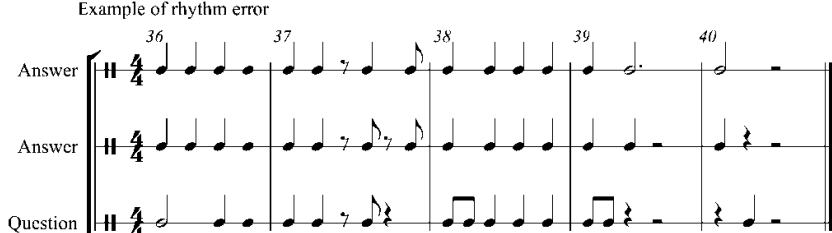
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General Marking Guidance


- 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	Question	Mark
1a	Listen to the drum part that you have imported. Quantise has been used to tighten the rhythm. Identify the most appropriate quantise value for this part. Put a cross in the correct box.	1
	Acceptable Answers	
	B 1/16	

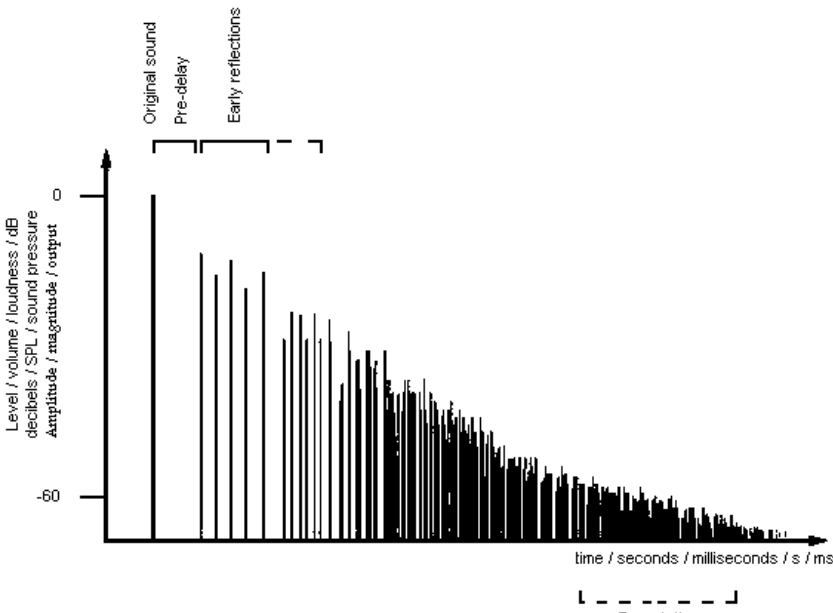
Question Number	Question	Mark
1b	Bars 36-40 of the kick drum are notated below with one rhythm error in each bar. Using the blank stave, correctly notate the kick drum rhythm for bars 37-40 , using rests as required. Bar 36 has been completed for you as an example.	4
	Acceptable Answers	
	<p>Example of rhythm error</p>  <p>Answer</p> <p>Answer</p> <p>Question</p>	
	1 mark for each complete bar. Allow either of the two answers above, or any combination of the two. Allow any note duration as long as the start points are in the correct place, and the bars add up correctly.	

Question Number	Question	Mark
1ci	Listen to bars 2-5 of synth 1. During beats 1 and 2 of each bar, which aspect of the sound is being automated?	1
	Acceptable Answers	
	B Pitch bend	

Question Number	Question	Mark
1cii	During beat 4 of each bar, which aspect of the sound is being automated?	1
	Acceptable Answers	
	A Filter cutoff frequency	

Question Number	Question	Mark
1di	Bars 27-31 of synth 1 are notated below. Fill in the four missing pitches (each marked by an asterisk).	4
	Acceptable Answers	
	<p>Actual</p>  <p>G B D B</p>	

Question Number	Question	Mark
1dii	In the score, what articulation marking is used?	1
	Acceptable Answers	
	C Staccato	

Question Number	Question	Mark
1e	<p>Reverb has been applied to synth 1 between bars 27-31. The graph below shows how the original sound and the reverb decays.</p> <p>(i) Label the two axes. Y-axis: level / volume / loudness / dB / decibels / SPL / sound pressure / amplitude / magnitude (1) X-axis: (reverb) time / seconds / s / milliseconds / ms (1) Apply SONC: e.g. (reverb) time and frequency on x-axis</p> <p>(ii) Label the pre-delay time. Indication of the gap between the original sound and the first reflection within the bracket (1)</p> <p>(iii) Label the early reflections. Any indication MUST be within the solid bracket. Only apply SONC if indication extends beyond the dotted bracket. (1)</p> <p>(iv) Label the reverb time (RT_{60}). Ignore start of reverb time. Clear indication of end of reverb time must fall anywhere in the dotted area between "u" in "Question" and "a" in "mark" in question paper. (1)</p>	5
Acceptable Answers		
		



Question Number	Question	Mark	
2(a)	Create a synthesiser sound that matches the timbre "synth 2 example.wav". <ul style="list-style-type: none"> • Ensure that the octave matches the example. • Use a saw wave without any added effects. • There should be no filtering. • Copy the envelope used in the example. 	4	
	Acceptable Answers		
	The given example was 0:46 – 0:56 (or an equivalent location for candidate responses with more/less silence at the start of the CD track).		
	"Chords" timbre Correct octave and pitches AND Saw wave timbre. Allow square or pulse AND a polysynth (1) <i>Award 0 if any FX are added.</i>		
	Fixed maximum LPF cutoff frequency and no resonance throughout the long chord at 0:46 (1)		
	Decay fades AND fast attack AND no portamento (1)		
	Zero release. (1) <i>Chorus should sound staccato</i>		
	If "chords" is not soloed or the metronome is switched on, assess what can be heard clearly.		

Question Number	Question	Mark										
2b	In the table below, identify the velocity of each note indicated in the first chord of bar 32 . An example has been given.	3										
	Acceptable Answers											
<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Pitch</th> <th>Velocity</th> </tr> </thead> <tbody> <tr> <td>A3</td> <td>123</td> </tr> <tr> <td>D4</td> <td>124 (1)</td> </tr> <tr> <td>E4</td> <td>125 (1)</td> </tr> <tr> <td>E5</td> <td>122 (1)</td> </tr> </tbody> </table>			Pitch	Velocity	A3	123	D4	124 (1)	E4	125 (1)	E5	122 (1)
Pitch	Velocity											
A3	123											
D4	124 (1)											
E4	125 (1)											
E5	122 (1)											

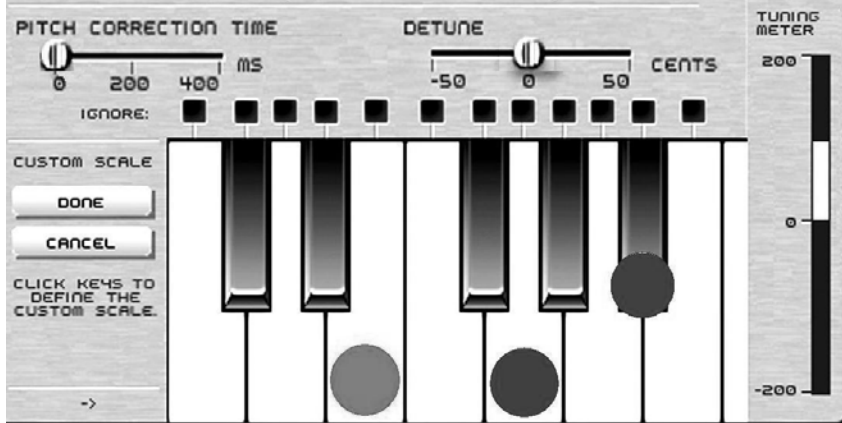
Question Number	Question	Mark
2c	Identify the highest pitch bend value in bar 18 .	1
	Acceptable Answers	
	52 / 6663 / 116 / 14855 / 81%	

Question Number	Question	Mark	
2d	In bar 19 , the chords play out of tune. Correct the MIDI programming error to ensure that the chords plays in tune throughout.	2	
	Acceptable Answers		
	Listen to the whole of the "chords" part. Check the verse, just after the break, at 0:32 (or an equivalent location for candidate responses with more/less silence at the start of the CD track).		
	Mark		Correcting pitchbend error
	2		Good – all pitches have been corrected
	1		An attempt has been made but not all pitches have been corrected OR there is a glitch where the pitchbend has been corrected
	0		The MIDI file has not been altered or additional errors introduced
	If "chords" is not soloed then assess what you can hear clearly up to max 1. If metronome is switched on with the soloed "chords" part then assess what can be heard clearly up to max 2.		

Question Number	Question	Mark	
2e	List four MIDI messages used in MIDI files.	4	
	Correct Answers		Acceptable Answers
	Note on Note off Pitch bend Controller System exclusive Aftertouch/ Channel pressurePolyphonic aftertouch / poly pressure Program change Song position pointer (not "position") Tempo Time signature		Note (only if Note on / Note off have not already been credited) Allow any valid controller name e.g. <ul style="list-style-type: none"> ○ Modulation ○ (Main channel) volume ○ Pan / panning / panorama ○ Balance ○ Expression ○ Foot Controller ○ Breath ○ Portamento time ○ Sustain / damper ○ Reverb / effects depth 1 ○ Chorus / effects depth 3 ○ Cutoff/brightness ○ Resonance / harmonic content ○ Attack ○ Release ○ Reset controllers Do not accept controller numbers.

Question Number	Question	Mark
3a	<p>The vocal was recorded with a condenser microphone using the switch settings shown in the table below. Identify the switches, describe what they do and explain why the settings have been selected for this recording. An example has been given.</p>	6
Acceptable Answers		
	Switch	Identify the Switch
	Polar response / pick-up pattern / polar pattern (1)	Describe what this switch does and explain why this setting has been selected Directional characteristics (1) Figure of 8 / Cardioid / Omni (1) Proximity effect (1) Changes level of ambience / reverb / noise / spill (1) Selects between capsules (1)
	Pad / attenuator / sensitivity switch (1)	Reduces / alters sensitivity of microphone / volume / gain (1) Reduces distortion (1) Recording loud sounds (1) dB (1) Vocals not loud / not high SPL / mic needs to be at max sensitivity (1)

Question Number	Question	Mark
3b	Using appropriate production and editing tools, replace the noisy end section of "vocal main.wav" with the corresponding section of "vocal end.wav".	4
Acceptable Answers		
Listen to the penultimate phrase " <i>I wanna dance with you</i> ". The edit point will be +/- 1s of the "y" in " <i>you</i> ". Approx 1:07.		
Mark	Preparation of vocal track — Removing unwanted noises	
4	Edit point is quieter than or equal to L.	
3	The edit is in time, but a click, glitch or phasing can be heard which is quieter than J.	
2	The edit is in time, but click louder than or equal to J is present or glitch / drop out similar to M	
1	The edit is more than a semi-quaver out of time and/or unmusical.	
0	No attempt at editing - the noise on the vocal is still audible.	
	If the vocal is not soloed, or metronome is switched on, then assess what can be heard clearly up to max 2.	

Question Number	Question	Mark
3c	<p>Pitch correction has been used on the vocals during bars 14-17 to create a robotic effect.</p> <p>(i) On the picture below, indicate the slider position for the "Pitch Correction Time" that has been used to create a robotic effect.</p> <p>(ii) A custom scale of three notes has been used to restrict the pitches the pitch correction will tune to. One of the notes (E) has been given as an example. Indicate the other two notes on the picture below.</p>	3
Acceptable Answers		
<p>(i) 0ms (allow middle of slider up to H in "pitch"). (1)</p> <p>(ii) Notes G and A# / Bb selected. See picture. (1 mark for each note) If >2 notes selected = SONC</p>		
		

Question Number	Question	Mark
4a	<p data-bbox="423 258 1232 415">What is EQ? Describe the following types of EQ found on a software plug-in: high pass filter; low shelf; band; high shelf; low pass filter. Give one practical use for each type. Describe the differences between parametric EQ and graphic EQ.</p> <p data-bbox="423 426 704 457">Acceptable Answers</p> <p data-bbox="423 489 1224 552"><u>Underlined technical terms must be spelt correctly (allow American spellings)</u></p> <p data-bbox="423 594 802 667">Description of EQ: <u>Equalisation / equalise</u> (1). Change volume of / boost or cut (1) <u>frequency / frequencies</u> (1) <u>Spectral mixing</u> (1)</p> <p data-bbox="423 825 1182 898">Description of where it can be found, e.g. PA system / mixer / hi-fi / car stereo / portable stereo (1)</p> <p data-bbox="423 940 932 1014">Frequency measured in <u>Hz / kHz</u> (1) Loudness measured in <u>dB</u> (1)</p> <p data-bbox="423 1056 1224 1129">Switch to bypass / turn each section on and off. (1) used to compare between before and after (1)</p> <p data-bbox="423 1171 1110 1245">Master output / makeup gain (1) to keep volume consistent between input and output (1).</p> <p data-bbox="423 1287 980 1318">Boosting could cause clipping / hiss (1).</p> <p data-bbox="423 1360 964 1392">Can affect phase / linear phase EQ (1)</p> <p data-bbox="423 1434 607 1465"><u>Analyser</u> (1)</p> <p data-bbox="423 1854 607 1885">For all EQs:</p>	16

Gain (1)

Cutoff / centre (frequency) (1) which is variable / sweepable (1).

Q / quality (1) slope / roll-off (1) measured in dB per octave (1) alters the bandwidth / range of frequencies affected (1). Resonance / resonant peak (1)

Applications must not be generalised. These would be too generalised for credit:

- removing background noise (because type of background noise not specified)
- makes mix bassier (because aspect/instrument in mix not specified)

For each graph: correct shape (1)

Labeled axes should not be credited for many graphs.

x-axis: Hz/Frequency (1). Appropriate numbers ranging from 20 to 20k (1)

y-axis: dB/volume/gain (1). Appropriate numbers: allow +-6 to +-40(1).

High pass filter

Removes / decreases low frequencies / cuts below F_c (1)

Credit any valid example of use: e.g. usually around 20-

120Hz / remove rumble / remove hum / plosives /

reduce proximity effect / telephone effect / dynamic

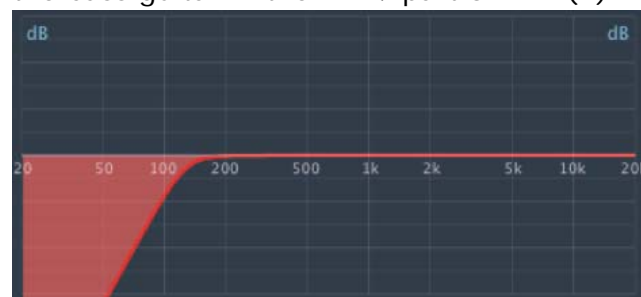
swells / filter sweeps / thin voices / crossover /

multiband processing / remove sub-bass / overheads to

remove kick drum boom / remove bass from reverb /

remove LF / LM from acoustic guitars / make space for

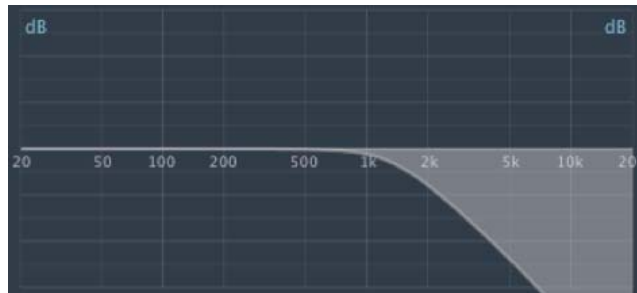
the bass guitar in the mix / part of BPF (1)



Low pass filter

Removes / decreases high frequencies / cuts above F_c
(1)

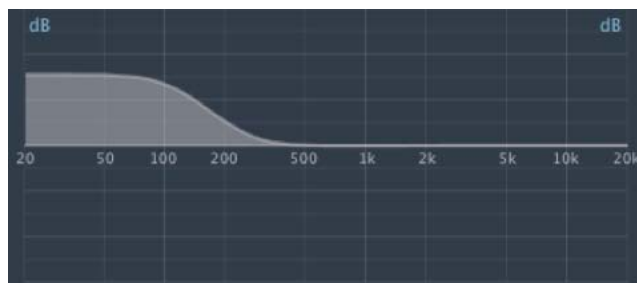
Credit any valid example of use: e.g. reduce hiss / filter sweeps / subby bass guitar / crossover / multiband processing / part of BPF / reduce spill from cymbals on kick mic (1)



Low shelf

Low frequencies / bass / $< 200\text{Hz}$ (1)

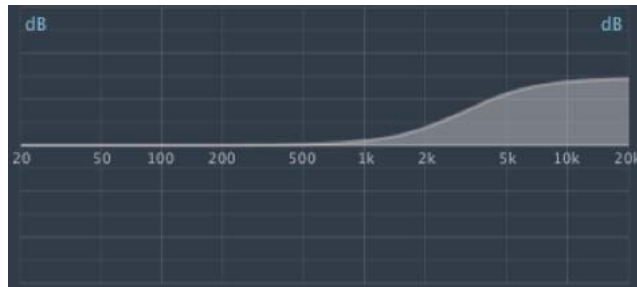
Credit any valid example of use: e.g. Bassier kick drum / bass guitar / loudness curve / increases perceived loudness (1)



High shelf

High frequencies / treble / >2kHz (1)

Credit any valid example of use: e.g. bring something (vocal / reverb / acoustic guitar) forward in the mix / clarity on overheads / correct lack of HF response from dynamic mics / gentle high-shelf boost for mastering / loudness curve / increases perceived (1)



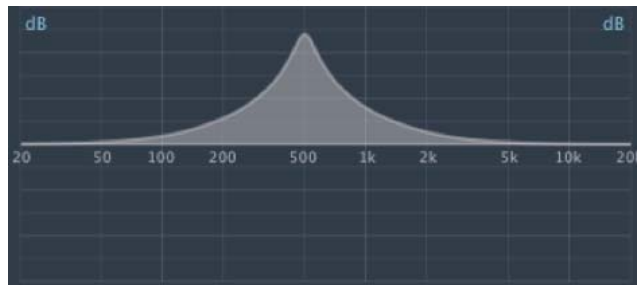
Band EQ (NOT BPF)

Mids (1)

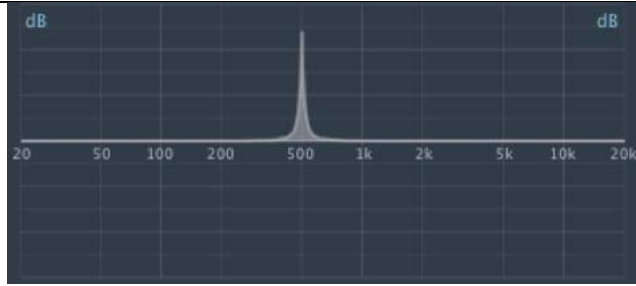
Notch filter (1)

Credit any valid example of use: e.g. cut to reduce a troublesome resonance or node / snare drum ring / boost at around 2kHz to bring out the beater of a kick drum / mid-band scoop on a distorted electric guitar / reduce LM to make mix less muddy / reduce sibilance (1)

Low Q = wide band (1):



High Q = narrow band (1):



Graphic EQ differences:

More bands (1)

Amps/pedals 5-10 bands (1)

Studio / PA use 25-31 bands (1)

3 bands per octave / 1/3 octave equaliser (1)

Fader / Slider (instead of knob) (1) for each frequency (1)

Positions of sliders resemble a graph of the frequency response (1)

Bands have fixed Q / bandwidth (1)

Bands have fixed frequency (1)

Normally used for live use (1) to correct the frequency response of a room / speaker system (1). Reduce feedback (1)

Question Number	Question	Mark
4b	<ul style="list-style-type: none"> Figure 1 shows an analogue subtractive synthesiser from the 1970s. Many of the controls are similar to those of a software synthesiser plug-in. Explain the function of the controls seen in figure 1. Identify the benefits of using subtractive synthesiser software rather than 1970s analogue technology. Figure 1 is provided on a supplementary page. 	16
	<p data-bbox="427 613 704 640">Acceptable Answers</p> <p data-bbox="427 646 1170 709"><i>Comments must relate to the correct control given in ITALICS.</i></p> <p data-bbox="427 747 1127 779"><u>Underlined technical terms must be spelt correctly</u></p> <p data-bbox="427 814 732 846">Voltage controlled (1)</p> <p data-bbox="427 882 586 913">Modulator</p> <p data-bbox="427 919 1154 982"><u>LFO / low frequency oscillator</u> (1) <u>sine, square</u> (both needed for mark 1) and <u>sample and hold</u> (1).</p> <p data-bbox="427 989 1105 1020"><i>RATE</i> is frequency (1) shown by flashing LED (1)</p> <p data-bbox="427 1026 1203 1089"><i>DELAY TIME</i> is the time taken for the LFO to begin after a note on (1).</p> <p data-bbox="427 1125 493 1157">VCO</p> <p data-bbox="427 1163 899 1194">(Voltage controlled) <u>oscillator</u> (1).</p> <p data-bbox="427 1201 545 1232">Pitch (1)</p> <p data-bbox="427 1239 1195 1281"><i>TUNE</i> is required because analogue synthesisers go out of tune / <i>POWER</i> needs to warm up to stay in tune (1).</p> <p data-bbox="427 1287 659 1318"><u>Fine / coarse</u> (1)</p> <p data-bbox="427 1325 1219 1388"><i>MOD</i> is the amount of LFO <u>applied to the pitch</u> (1) giving vibrato (1).</p> <p data-bbox="427 1394 1219 1457"><i>RANGE</i> = octave (1) measured in feet / like a pipe organ (1)</p> <p data-bbox="427 1463 1122 1526"><i>WAVEFORM</i> = <u>pink/white</u> (1) noise. <u>Saw, square,</u> (pulse) (both needed for mark 1).</p> <p data-bbox="427 1533 980 1564">Keyboard changes frequency / pitch (1)</p> <p data-bbox="427 1570 1187 1633"><i>PULSE WIDTH</i> is mark-space ratio (1) accept any clear explanation of mark-space ratio.</p>	

VCF

(Voltage controlled) filter (1).

Low pass filter / LPF (1) apply SONC if HPF / BPF also.

Removes high frequencies / more muffled / brightness

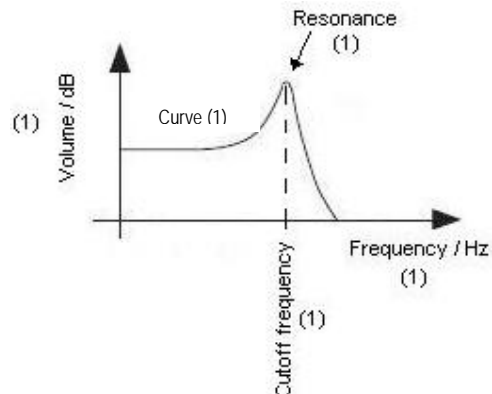
(1) **above** the CUTOFF FREQUENCY (1)

RESONANCE boosts the frequencies around the cutoff

frequency (1)

Max 5 for correctly labelled diagram:

Allow a curve without resonance.



Envelope can control the filter cutoff frequency (1). The envelope can be inverted (1). ENV FOL'R envelope follower (1)

MOD is the amount of LFO applied to the filter cutoff frequency (1) giving wah-wah / any description of filter changing over time (1).

VCA

(Voltage controlled) amplifier (1)

HOLD = the note stays on forever (1)

ENV = control how the volume changes over time (1).

GATE = envelope can be switched off (1).

Keyboard triggers gate (1)

ENV

Amplitude (1) Envelope (1)

Attack, decay, sustain, release (1)

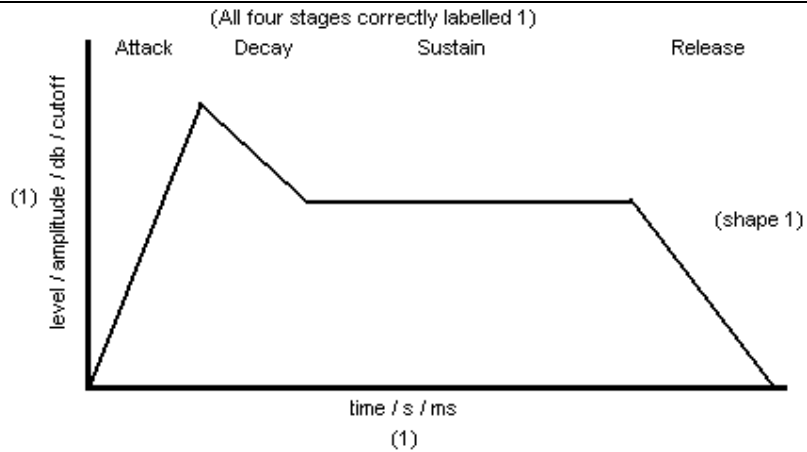
Credit written explanation or the graph to max 4

A = time taken for sound to reach maximum volume from 0 volume (1)

D = time taken for sound to reach sustain level from maximum (1)

S = level (held until note off) (1)

R = time taken for sound to reach zero after note off (1)



BENDER

Change the pitch (1) Change the filter cutoff frequency (1).

PORTAMENTO

Allows the pitch of the notes to slide into each other / glide (1).

Speed can be adjusted (1)

Benefits of plug-ins:

can be automated / MIDI controlled / sequenced (1)

velocity (1)

tempo sync LFOs / arpeggiators (1)

better signal to noise ratio (1)

presets / save sounds / new sounds over internet (1)

different settings on separate tracks / multiple use of the same plug-in with different settings (1)

stays in tune (1)

increased polyphony (1)

more envelope stages (1)

more types of waveforms (1)

more / multiple oscillators (1)

more filter types (1)

Other synthesis types (1) granular / additive / ring / AM / FM / wavetable / sample and synthesis / virtual modelling (1)

require less maintenance / no dirty pots / takes up less space / cheaper (1) (not less equipment / computer)

14 – 16	<p>An excellent response. Substantial and thorough with a perceptive and accurate commentary on the main points of the detailed assessment criteria.</p> <p>The response will be coherent in terms of structure. There will be an excellent understanding of technical issues.</p> <p>QWC: Very few syntactical and/or spelling errors may be found but these will not detract from the overall coherence. Excellent organisation and planning. All the skills required to produce convincing writing are in place.</p>
10 – 13	<p>A good response. Detailed and accurate commentary on the main points of the detailed assessment criteria. The response will be coherent on the whole and a good understanding of technical issues is shown.</p> <p>QWC: Few syntactical and/or spelling errors may be found but these will not detract from the overall coherence. Good organisation and planning. Almost all of the skills required to produce convincing writing are in place.</p>
6 – 9	<p>An acceptable response. There may be limited detail, but reference has been made to most of the main points in the detailed assessment criteria. The response will have some coherence, but may lack a sense of understanding of technical issues at times.</p> <p>QWC: Some syntactical and/or spelling errors may be found but overall the writing is coherent. Some organisation and clarity. Most of the skills needed to produce convincing writing are in place.</p>
2 – 5	<p>A limited response. Mention has been made of some of the main points on the detailed assessment criteria, but little reason has been given for them.</p> <p>The response will have limited coherence and little understanding of technical issues.</p> <p>QWC: Some syntactical and/or spelling errors are present. The writing will display some degree of organisation and clarity but this will not be sustained throughout the response. Some of the skills needed to produce convincing writing are in place.</p>
1	<p>A poor response with little reference to any relevant technologies.</p> <p>QWC: Frequent syntactical and/or spelling errors are present. The writing contains passages which lack clarity and organisation. A few of the skills needed to produce convincing writing are present.</p>

Question Number	Question	Mark
5(a)	<p>(a) Compress the vocals.</p> <ul style="list-style-type: none"> • The compression should suit the style of the music. • Ensure that all parts of the vocal can be heard above the other parts. • Ensure that the dynamics of the performance are level throughout and do not jump out of the mix. • Do not over compress the vocals. 	3
Acceptable Answers		
	<p>Management & control of the vocal dynamics This is best assessed in the intro and at 1:02 where there is a wide dynamic difference between each phrase.</p>	
3	All of the vocal is clearly audible, especially in the intro and at 1:02. Overall, the dynamic range is $\leq N$.	
2	All of the vocal is clearly audible, especially in the intro and at 1:02. Overall, the dynamic range is $\leq N$ but: Vocal noise $> J$ OR Transients $\geq J$ on "go crazy" (attack time too long on compressor)	
1	The vocals have audible compression \geq candidate K and the dynamic range is reduced, however some parts of the vocal are partially masked / uneven level OR Clearly audible volume automation	
0	No compression can be identified on the vocal; compression less than candidate K. OR No mix present on CD.	

Question Number	Question	Mark
5b	<p>(b) Apply an automated filter to the chords.</p> <ul style="list-style-type: none"> • Only bars 10-26 should be affected. • Use a low pass filter with a steep roll-off. • The cutoff frequency should be set low in bar 10, but the chords must still be clearly audible. • Gradually increase the cutoff frequency so that the effect continues to build until the end of bar 26. 	
Acceptable Answers		
Management & control of "chords" filtering		
	<p>3 The cutoff frequency of the low pass filter smoothly rises throughout the whole verse.</p>	
	<p>2 A variable low pass filter is used to create some sense of crescendo but: There could be an audible join between sections. OR First few notes masked because cutoff starts too low OR No sense of crescendo in second half of verse / cut off rises too quickly</p>	
	<p>1 A jerky or static low pass filter or low-shelving EQ is used that creates a noticeable contrast with the breakdown OR Other parts of "chords" are affected by the filtering. OR Other instruments are filtered, e.g. the candidate has also filtered the drums OR Wrong filter type</p>	
	<p>0 There is no clearly audible low pass filtering or low-shelving EQ on "chords". OR No mix present on CD.</p>	

Question Number	Question	Mark										
5(c)	<p>(c) Apply a mono delay effect to the vocals.</p> <ul style="list-style-type: none"> • Use a quaver synced delay. • Use 40% feedback so that the delay gradually fades. • The delay should be clearly audible. • Ensure that the delay is not intrusive. 	3										
Acceptable Answers												
Base any borderline decisions on "pump" at 0:30.												
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Question Number	Question	Mark
5(d)	Apply automated panning to the word "too" in bars 26-27 of the vocals . <ul style="list-style-type: none"> • The word "too" should move smoothly across the stereo field from right to left. • Ensure that all other vocal phrases are panned to the centre. 	
Acceptable Answers		
	Management & control of the vocal panning automation	
3	"too" pans from right to left in bars 26-27	
2	C – L OR L – R OR R – C OR late or early within "too"	
1	Erratic panning AND/OR Vocal panned in a single position other than centre. AND/OR The vocal does not reset to centre. AND/OR Other parts / instruments panned off centre	
0	There is no audible panning automation. OR No mix present on CD.	

Question Number	Question	Mark										
5(e)	Balance the mix. <ul style="list-style-type: none"> • The balance should suit the style of the music. • Ensure that all of the tracks can be heard clearly. 	3										
Acceptable Answers												
Candidates will need to bring up the level of the drums to score more than 1.												
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Question Number	Question	Mark
5(f)	Produce a final stereo mix. <ul style="list-style-type: none"> • Ensure that the mix output is at as high a level as possible. • It should be free from distortion. • Do not limit or compress the mix output. • Ensure that the beginning of the music and the reverb tail are not cut off. • Ensure that silences at the beginning and end do not exceed one second. 	3
Acceptable Answers		
Presentation of mix		
3	Beginning and end of mix does not cut out music or delay tail. The beginning should have 0.2-1 seconds of silence before the music starts. The mix output should be near normalised with no distortion.	
2	Beginning and end of mix does not cut out music or delay tail. The beginning has a silence of greater than 1 second. The end has greater than 5 seconds of silence. OR The mix output is too low OR is compressed OR there is some slight distortion.	
1	Obviously chopped start or ending. 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 IGNORE previously assessed work: Vocal timing in final two phrases Chords pitches	
0	No mix present on CD.	

