Mark Scheme (Results)

Summer 2012

GCE Music Technology (6MT04)
Paper 01

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Question Number	Question	Mark
1(a)	What key is the music in?	**1**
	Acceptable Answers	
	C# minor C# m (lower case m) C# min C# Aeolian	

Question Number	Question	Mark

1(b)	Between **bars 6–18** there are **two** pitch errors in the score. An example of a pitch error is given in bar 2.
	  ▪ Identify the **two** pitch errors. Circle each incorrect pitch.
	  ▪ Notate each correct pitch on the blank stave above.
		4

	Acceptable Answers	
	One mark for each pitch circled; 1 mark for each correct pitch written. (See score opposite) Only credit if only one note is circled.	

Question Number	Question	Mark

1(c)	Between **bars 6–18** there are **two** rhythm errors in the score. An example of a rhythm error is given in bar 2.
	  ▪ Identify the **two** rhythm errors. In each case, circle the **entire bar**.
	  ▪ Notate each correct rhythm for the **entire bar** on the blank stave above.
		4

	Acceptable Answers	
	One mark for each bar circled; 1 mark for each correct rhythm written. The whole of the corrected rhythm bar must be accurate. (See score opposite) Only credit if only one error is circled within a bar. Beaming of quavers must be correct.	

Example of pitch error   Example of rhythm error

Question Number	Question	Mark
1(d)	Quantise has been used on this bass part to tighten the rhythm. Identify the most appropriate quantise value for this part. Put a cross in the correct box:	1
	Acceptable Answers	
	1/8	

Question Number	Question	Mark
1(e)	The use of quantise can make a performance sound mechanical. Describe a quantising method that can tighten the rhythm whilst preserving some of the natural feel.	3
	Acceptable Answers	
	Humanise / randomise (1) takes a <u>fully</u> quantised performance (1) then moves notes slightly out of time (1). **Percentage (%) quantise / (quantise) strength / iterative (quantise)** (1) moves the notes partially towards (the sub division of) the beat (1) instead of exactly on (the subdivision of) the beat (1). For example 50% moves the notes halfway towards (the subdivision of) the beat (1) Accept any valid example of %. **Swing / groove (quantise)** (1) moves the notes to positions on a groove template (1). A groove template can be taken from another track/library/preset (1). Certain beats may occur slightly later or earlier (1) than the exact beat. Allow example of groove template, e.g. 16A (1) (Allow percentage quantise marks) **Magnetic area / include** (1) allows you to set a range to affect which notes get quantised (1). Only the notes near the grid lines get quantised (1) leaving grace notes/trills etc unquantised (1). (Allow percentage quantise marks) **Tempo map** (1) vary the tempo slightly/ +-10 BPM/applying small accelerandos (1) after applying (hard) quantisation (1) especially around the fills (1). **Manual (quantise) / drag the notes with mouse / by hand** (1) **Only quantise out of time/difficult to play sections** (1) **Max 1 for methods shown in bold**	

"task 1 bass.wav" is worth full marks and is what the candidate should be aiming for with "track 1" on their CD.

Question Number	Question	Mark
1(f)	In **bars 30-31** of the audio file, the bass part has been incorrectly transposed. Using appropriate processing, correct the bass part so that it plays the pitches indicated in the score.	4

Acceptable Answers

Listen to task 1.

Mark	Preparation of bass part – correcting the pitch
4	Excellent – bass plays correct notes throughout the track and the edit point cannot be heard
3	Good – bass plays correct notes throughout the track but the edit point may be heard as a click
2	Inconsistent – correct notes are heard throughout but with an incorrect effect mix causing obvious modulation
1	Poor – an unsuccessful attempt has been made to correct the pitch error, e.g. the pitch has been changed to incorrect notes or there are additional/missing notes or timing errors
0	No attempt at editing OR The bass is at the same pitches as the original
	-1 if the final note has also been affected by pitch processing If the bass is not soloed, or metronome is switched on, then assess what can be heard clearly up to max 2.

(Total for Question 1 = 17 marks)

Question Number	Question	Mark
2(a)	This guitar was recorded using an electric guitar with a single coil pick-up. What problem has this created?	1

Acceptable Answers

Noise/Hum (1) (not background/metronome noise/spill/hiss)
Allow
AC/Mains/RF/Radio frequencies (1)
Interference (1)
Buzz (1)

Question Number	Question	Mark
2(b)	Which type of pick-ups can reduce this problem? Describe how they work.	4

Acceptable Answers

Humbucker pick-ups (1) have a double-coil (1) design. The coils are wired out of phase/with opposite polarity (1) so noise/hum cancels out (1) through destructive interference (1).
The voltage/output/power/level/volume/amplitude is higher (because there are two coils) (1).
"Noiseless" pick-ups (1) and active pick-ups (1)

"task 2 complete guitar.wav" is worth full marks and is what the candidate should be aiming for with "track 2" on their CD.

Question Number	Question	Mark
2(c)	Using appropriate production and editing tools, remove the unwanted noise from the distorted guitar part.	4
	Acceptable Answers	
	Listen to task 2.	

Mark	Preparation of guitar track — removing unwanted noises
4	Carefully edited distorted guitar. The distorted guitar is intact without any sections cut out and with no unwanted noises present.
3	The distorted guitar is intact with no abrupt cuts but with some unwanted noises still present. OR Minor parts of distorted guitar have been cut off, but no unwanted noises present.
2	Parts of distorted guitar have been obviously cut off
1	More than one crotchet of the guitar has been cut out OR More than one crotchet of noise has been left in
0	No attempt at cutting out any noise / completely silent track

Note:
If guitar track is not soloed, or metronome is switched on, assess what can be heard clearly up to max. 2.

Question Number	Question	Mark
2(d)	Use a new **stereo** track for the verse electric guitar part. "guitar1.wav" is the correct length and fits exactly into two bars. However, "guitar2.wav" is slightly too long. Trim "guitar2.wav" so that it loops accurately over two bars without audible clicks. The first chord should start on the first beat of the bar.	3
	Acceptable Answers	
	Listen to task 2.	

Mark	Preparation of guitar track - removal of clicks
3	Excellent – carefully edited guitar; no edit points can be heard
2	Competent – a slight fade, click or glitch can be heard at some edit points in the verse
1	Poor – an intrusive fade, click or glitch can be heard at some point in the verse OR An unsuccessful attempt has been made at editing
0	No attempt at editing - the original samples are used unedited.
	If the guitar is not soloed, there is extraneous noise or metronome is switched on, then assess what can be heard clearly up to max 2.

Question Number	Question	Mark
2(e)	Assemble the verse electric guitar part by copying and pasting together your edited samples as shown in the table below. The part should remain in time with the drums and bass.	3

Acceptable Answers
Listen to task 2 and task 3 so that the guitar can be compared with the drums and bass.

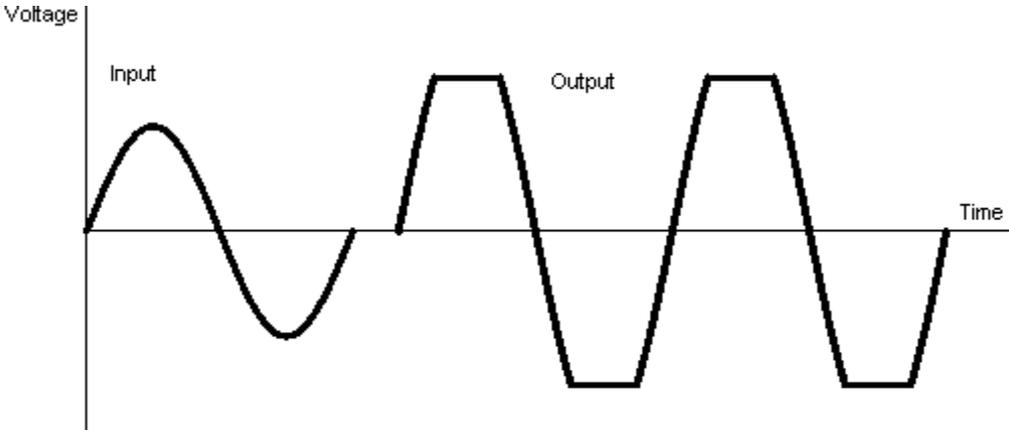| Mark	Preparation of guitar track – arrangement and timing
3	Excellent – correctly arranged guitar; the guitar is in time with the drums and is musical
2	Competent – correctly arranged guitar but the guitar is audibly out of time
1	Poor – all three samples have been used but they are incorrectly arranged with samples out of order or incomplete OR More than a quaver out of time
0	No attempt at arranging the samples. OR Not all three samples have been used.
	If task 3 is not assessable then max 2

Question Number	Question	Mark
2(f)	Identify the guitar pedal used in the verse for the electric guitar part. Describe how it works.	4

Acceptable Answers
Wah-wah / wah / Cry Baby (1) **Don't credit SONCs** Variable/Sweeping (1) cut off/frequency (1) band pass / <u>resonant</u> low pass/ peak response (1) filter (1) with steep slope (1) which removes high (and low) / lets through a band of frequencies (1). Resonant LPF boosts frequencies at the cutoff point (1). <u>Pot</u>/<u>potentiometer</u>/ <u>variable resistor</u> (1) Bright when forward and dull when back (1) <u>Envelope follower</u> (1)

Question Number	Question	Mark
2(g)	Stereo double tracking has been added to the guitar parts throughout. Describe the processes that you would use to achieve this effect.	4

Acceptable Answers
<u>Copy</u> and paste the audio to another track (1) Apply a short (1) 10-60ms (1) delay/time difference (1) to only one channel with <u>no feedback</u> (1). Delay time shouldn't be too short otherwise phasing/flanging/comb filtering would occur (1). Allow: Apply slight (1) 5-15 cents (1) de-tuning/pitch shift (1) to <u>one</u> channel (1) Pan (hard) left and right / opposite pan (1) **Not stereo enhancer/chorus etc**

(Total for Question 2 = 23 marks)

Question Number	Question			Mark
3	Complete the table below to describe how you would mic a singer to achieve a similar recording to that heard in "vocal.wav". Give reasons for your choices. An example is provided for you.			6
	Acceptable Answers			
		What you would choose	Reasons for choice	
	Microphone type	Condenser Capacitor	Vocals have a <u>low</u> SPL (1) so would not distort or damage (1) a condenser microphone. Good at picking up high frequency detail/wider frequency response/flat frequency response (1). Sensitive (1) Wide dynamic range/low noise (1)	
		LDC	Fast transient response (1) (LDC) is good for capturing warm tones of a male vocalist (1) softens transients (1).	
		Dynamic	<u>High</u> SPL (1) Max 1 because recorded using condensor	
		(1)	**(2)**	
	Microphone polar pattern	Cardioid Hyper cardioid Super cardioid Uni-directional	Rejects background noise / spill (1) Directional/pick ups in front (and sides) (1) Less reverb / less ambience / dry (1) NOT "only the sound of the vocal is picked up" Proximity effect (1) adds warmth (1) by emphasising low frequencies (1) Presence peaks / high mid range boost (1) helps the vocals cut through (1)	
		(1)	**(2)**	
	The "What" box must be correct to award a mark in the "reason" box. Award accurate diagrams for "What" box			

(Total for Question 3 = 6 marks)

Question Number	Question	Mark
4(a)	Distortion is used on the electric guitar to modify the tone and increase sustain. Describe what distortion is. Describe the various ways that distortion has been added to the electric guitar from the 1950s to the present day.	**16**
	Acceptable Answers	

In the context of electric guitar, distortion is created by clipping/cutting off of the waveform (1).
Distortion can occur by overloading an amplifier/pushing an amplifier to output more than it is capable (1).
The resulting signal has more power (1). The resulting signal has more harmonics/partials (1) giving a brighter/harsher tone/crunchy (accept any valid descriptor) (1).

Harmonic distortion (1). Inter-modulation distortion / IMD (1).

Marks for diagram below. Labelled voltage/amplitude axis (1). Labelled time axis (1). Unclipped input signal (1). Clipped output signal (1).

In early days distortion was often added to a guitar by valve falling out/being damaged (1) or cutting holes in the speaker cone (1). Some plugged their guitar directly into the mixing desk and turned up the channel gain (1).
Some artists chained amps together to achieve a distorted tone (1). In the 1960s, Jim Marshall modified amplifier circuitry to make distortion easier to achieve (1). **Credit any identification of a guitar amplifier (1).**

Distortion is sometimes called fuzz/overdrive/clipping (max 1 for any of these terms). Fuzz is a more distorted / higher driven sound than overdrive (max 1 for any comparison of fuzz/overdrive).

Typical distortion controls:
A boost/drive/gain knob (1). A level/output/master/volume knob (1) is used to compensate for the increased gain/control clean-distorted volume difference (1).

Valve/tube (1) distortion:
As the amplifier approaches its maximum the increase in signal is non-linear (1). This results in the peaks in the waveform looking "squashed"/flattened/rounded etc (1). This produces soft clipping (1). The distortion tone is warm / less harsh (1). Allow diagram for soft clipping (1).

Transistor (1) distortion gives a harsher distortion (1) because hard clipping (1) occurs immediately when the maximum output is exceeded (1).

Pre-amplifier distortion (1)

The pre-amplifier is used to raise the weak signal output from the electric guitar (1) to a level that can drive the power amplifier (1). Some guitar amplifiers have two channels, one distorted, one clean/multiple gain stages (1).

Power amplifier distortion (1)
This is achieved by overdriving the power valves (1). The disadvantage of this method is the loud output from the speaker (1). A power attenuator/power brake (1) can be used to divert some of the power away from the speaker (1).

Distortion pedals/stomp box (1)
Often use transistor electronics (1) because they have a low voltage supply (1). However, some modern pedal designs include a valve/tube to emulate valve amp distortion (1). **Credit any identification of a distortion pedal max 1.**

Boost pedals (1) boost the signal between the guitar and the amplifier, essentially acting as another pre-amp stage (1).

Plug in/Digital Amp Modelling (1)
  ▪ **credit any identification of a software plug-in (1)**
  ▪ **Credit any identification of a hardware amp simulator (1)**
An advantage is that many different amplifier types can be achieved without having to buy many amplifiers (1). If software plug-ins are being used, the distortion can easily be altered during the mix stage (1).

Some guitars are equipped with high-output pickups (1) which require less amplification to drive the amp circuit to distortion (1). Some guitars are equipped with active electronics which can include distortion/boost circuits in the guitar itself (1).

Distortion can also be achieved by hard-limiting of a signal (1).
Reducing the bit-depth significantly/bit-crushing (1).
Hard-sync effects (1) where the output of an oscillator is combined with the guitar output (1).

Re-amping (1) is when the signal is sent to an amplifier during the mix stage (1).

1 mark for each distortion type/amount linked with a decade/artist/style up to max 3.

Question Number	Question	Mark
4(b)	On the insert provided, the picture shows a tape delay processor from the 1970s that is used to create echo effects. Many of the controls are similar to those of a software delay plug-in. Describe how a tape delay works and explain the function of the controls seen in the picture. Identify the benefits of using a software delay plug-in rather than 1970s tape technology.	**16**
	Acceptable Answers	
	How a tape delay functions: Analogue/analog* (1 if referring specifically to tape technology) Magnetic (1 if referring specifically to tape technology) Sound is recorded onto a (tape) loop (allow cycle) (1) via a <u>record head</u> (1). This sound is replayed through <u>play(back) heads</u> (1). There are multiple playback heads giving multiple echoes/taps/patterns/rhythms/types (1). If the <u>erase head</u> (1) is removed from the signal path, "sound-on-sound" / playing against oneself, building up textures is possible (1). <u>Delay time</u> (1) the amount of time between each repeat (1), is adjusted by the speed of the tape travel (1). If this is changed whilst the music is playing, the pitch of the delays will change (1). Also spacing of the playback heads (1). <u>Feedback</u> (1) is the amount of signal that remains on the tape which is not erased (1) OR which is the amount of delayed signal fed back into the record head/input/how much of the sound is repeated (1). This gives the number of repeats / makes the effect last longer (1). High levels of intensity/feedback cause distortion (1). Warm sound / less high frequency content / treble / is duller (1) <u>Tape saturation/tape compression</u> (1) <u>wow and flutter</u> (1). Tape degradation / stretching (1). Hiss (1) **Max 1** for identification of hardware (e.g. Copycat, Echoplex, Binson, Korg, Danelectro, Fulltone, Univox, **not Roland**) Description of picture: Peak Level. will illuminate / flash (1) if the signal clips / distorts (1). VU meter (1). This shows the input level (1) in Volume Units / allow dB (1). Mic / instrument volume. This is the <u>gain</u> (1). Reduced / turned down to prevent distortion / clipping (1) Turned up to obtain a better signal to noise ratio (1). Instrument volume. for a low impedance (1) instrument such as (electric) guitar (credit any other suitable instrument) (1). Mode selector. Used to select different taps / patterns / rhythms / types of delay / number or volume of repeats / combinations of playback heads (1). Bass/treble. Used to modify the tone / EQ/ highs & lows (1) of the delays, not the dry signal (1). Adjusts the low frequencies (1) for bass. High frequencies (1) for treble. <u>Shelving</u> (1). This is the <u>gain</u> (no multiple credit for gain) (1) Reverb volume/echo volume. No credit for the 'volume of the reverb'. Allow <u>wet/dry</u> / effect mix (1). "Straight" gives no echo at all (1). This is the <u>gain</u> (no multiple credit for gain) (1) Spring reverb (1). Repeat rate is the delay time / the amount of time between each repeat (1). Intensity is the feedback amount/number of repeats (1). This is the <u>gain</u> (no multiple	

credit for gain) (1).

Power. The unit should be switched off when not in use to preserve the life of the tape (1).

"Echo Normal"/"foot sw".   Bypass / in/out (1)

HML. This gives different output levels/volumes (1) so that the unit can match the different signal levels required by different studio equipment (1). impedance / resistance / ohms (1)

Benefit of plug-ins:
can be automated / MIDI controlled (1)
stereo / more inputs and outputs (1), ping-pong/each tap can be panned differently (1)
tempo sync (1)
improved accuracy of delay time / measured in ms (1)
more parameters (1)
better signal to noise ratio (1)
better (high) frequency response (1)
presets (1)
Different settings on *separate* tracks/multiple use of the same plug-in with *different* settings (1) **not same effect on many tracks** (e.g. aux)
greater number of taps available (1)
no maintenance issues / cleaning / new tapes (1)
plug-ins may emulate hardware delays (1).
Not more reliable/changeable during mixing/non-destructive

In the case that a student has answered both questions, mark both and take the highest mark, unless one response is crossed out.

14 – 16	An excellent response. Substantial and thorough with a perceptive and accurate commentary on the main points of the detailed assessment criteria. The response will be coherent in terms of structure. There will be an excellent understanding of technical issues. 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.
10 – 13	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. 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.
6 - 9	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. 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.
2 - 5	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. The response will have limited coherence and little understanding of technical issues. 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.
1	A poor response with little reference to any relevant technologies. 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.

Section B

5 You should now have the following tracks imported on the computer:
Electric guitar, drums, vocal and bass.

Produce a final balanced stereo mix with the following features:

"task 3 complete mix.wav" is worth full marks and is what the candidate should be aiming for with "track 3" on their CD.

Question Number	Question	Mark
5(a)	Apply EQ to one phrase of the **vocal** track. • Only the second phrase of the verse, *"or is the addiction something else"* should be affected. • Use appropriate EQ and/or filtering to give the vocal a telephone effect.	**3**
	Acceptable Answers	
	<table><tr><td colspan="2">Management & control of the vocal EQ</td></tr><tr><td>3</td><td>A successful telephone effect has been achieved in the verse without exaggeration. There is a clear contrast in the tone between the effected phrase and the remainder of the vocal. The remainder of the vocal part is unaffected. There is no audible join or volume change where the filtering changes.</td></tr><tr><td>2</td><td>A misjudged telephone effect has been achieved in the verse which may be exaggerated or too thin, or there is no clear contrast. The remainder of the vocal part is unaffected. There is an audible join or volume change where the filtering changes.</td></tr><tr><td>1</td><td>An unsuccessful attempt. OR Other phrases of the vocal part are affected by the filtering.</td></tr><tr><td>0</td><td>There is no clearly audible EQ on the vocal track. OR No mix present on CD.</td></tr></table>	

Question Number	Question	Mark

5(b)	Compress the **vocal** track.
	   ▪ 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 controlled and do not jump out of the mix.
	   ▪ Do not over compress the vocal.
		3

Acceptable Answers		

	Management & control of the vocal dynamics
3	The peaks are controlled effectively in the chorus and all of the vocal is clearly audible.
2	The vocals have some appropriate audible compression and the dynamic range is reduced, however either the peaks are not fully controlled or some parts of the vocal are partially masked by the guitar.
1	Compression is present but poorly managed. Excessive pumping evident.
0	No compression can be identified on the vocal. OR No mix present on CD.

Question Number	Question	Mark

5(c)	Apply automated panning to the repeats in the **vocal part**.
	   • Only **bars 22-23** should be affected; all other bars should be panned to the centre.
	   • The bar 22 should be panned hard left.
	   • The bar 23 should be panned hard right.	

Acceptable Answers		

	Management & control of the vocal panning automation
3	Successful panning automation with the vocal panning from left to right as directed
2	Competent panning automation with the vocal panning across the stereo field in some way but not as directed
1	Poorly managed panning automation with the vocal panned in a single position other than centre. OR The vocal does not reset to centre. OR Erratic panning OR Other bars affected by panning
0	There is no audible panning automation. OR No mix present on CD.

Question Number	Question	Mark
5(d)	Apply reverb to **each** of the four tracks. • Use a 1.5 second reverb time. • The reverb should not be intrusive. • The vocals should have more reverb than the instrumental parts	**3**
	Acceptable Answers	

	Application of reverb
3	Excellent use of reverb on at least four tracks including vocals and holistically less than or equal to the MS audio
2	Competent use of reverb with some misjudgements. More reverb than MS audio.
1	Serious misjudgement on 1 track or more. OR Wrong effect.
0	No use of reverb on any track. OR No mix present on CD.

Question Number	Question	Mark
5(e)	(e) Balance the mix. • The balance should suit the style of the music. • Ensure that all of the tracks can be heard clearly.	**3**
	Acceptable Answers	

	Balance and blend
3	Consistently well balanced and effectively blended across all parts of the mix.
2	Most tracks are well balanced. A few misjudgements.
1	Poorly balanced, detrimental to the musical outcome OR Not all tracks present/additional tracks.
0	No mix on CD OR Only a single track present.

Question Number	Question	Mark
5(f)	Produce a final stereo mix. • 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 reverb tail. The beginning should have no more than one second 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 reverb tail. The beginning and/or end has a silence of greater than 1 second. OR The mix output is too low OR is compressed OR mix is noticeably louder than MS audio
1	Obviously chopped start or ending. OR Any part is noticeably out of sync or missing (except the wah-wah guitar/bass guitar bars 30-32) OR The mix output is unacceptably low or too high (distorted). OR Excessive use of mix compression causes pumping OR Any detrimental EQ / panning on tracks other than vocal
0	No mix present on CD.

-1 if the metronome has not been turned off.

(Total 18 marks)

TOTAL FOR SECTION B: 18 MARKS

Ofqual

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Welsh Assembly Government

CCEA
Rewarding Learning