GCSE MARKING SCHEME

SUMMER 2022

GEOLOGY - COMPONENT 2
C480U20-1

INTRODUCTION

This marking scheme was used by WJEC for the 2022 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

GCSE GEOLOGY

COMPONENT 2 - GEOLOGICAL PRINCIPLES

SUMMER 2022 MARK SCHEME

Instructions for examiners of GCSE Geology when applying the mark scheme

1 Positive marking

It should be remembered that candidates are writing under examination conditions and credit should be given for what the candidate writes, rather than adopting the approach of penalising him/her for any omissions. It should be possible for a very good response to achieve full marks and a very poor one to achieve zero marks. Worthwhile answers that meet the requirements of the question, but do not appear on the mark scheme are to be given credit.

2 Tick marking

Low tariff questions should be marked using a points-based system. Each credit worthy response should be ticked in red pen. The number of ticks must equal the mark awarded for the sub-question. The mark scheme should be applied precisely using the marking details box as a guide to the responses that are acceptable. Do not use crosses to indicate answers that are incorrect.

3 Banded mark schemes

Banded mark schemes are divided so that each band has a relevant descriptor. The descriptor for the band provides a description of the performance level for that band. Each band contains marks. Examiners should first read and annotate a learner's answer to pick out the evidence that is being assessed in that question. **Do not use ticks** on the candidate's response. Once the annotation is complete, the mark scheme can be applied. This is done as a two-stage process.

Stage 1 – Deciding on the band

When deciding on a band, the answer should be viewed holistically. Beginning at the lowest band, examiners should look at the learner's answer and check whether it matches the descriptor for that band. Examiners should look at the descriptor for that band and see if it matches the qualities shown in the learner's answer. If the descriptor at the lowest band is satisfied, examiners should move up to the next band and repeat this process for each band until the descriptor matches the answer.

If an answer covers different aspects of different bands within the mark scheme, a 'best fit' approach should be adopted to decide on the band and then the learner's response should be used to decide on the mark within the band. For instance if a response is mainly in band 2 but with a limited amount of band 3 content, the answer would be placed in band 2, but the mark awarded would be close to the top of band 2 as a result of the band 3 content.

Examiners should not seek to mark candidates down as a result of small omissions in minor areas of an answer.

Stage 2 – Deciding on the mark

Once the band has been decided, examiners can then assign a mark. During standardising (marking conference), detailed advice from the Principal Examiner on the qualities of each mark band will be given. Examiners will then receive examples of answers in each mark band that have been awarded a mark by the Principal Examiner. Examiners should mark the examples and compare their marks with those of the Principal Examiner. When marking, examiners can use these examples to decide whether a learner's response is of a superior, inferior or comparable standard to the example. Examiners are reminded of the need to revisit the answer as they apply the mark scheme in order to confirm that the band and the mark allocated is appropriate to the response provided.

Indicative content is also provided for banded mark schemes. Indicative content is not exhaustive, and any other valid points must be credited. In order to reach the highest bands of the mark scheme a learner need not cover all of the points mentioned in the indicative content but must meet the requirements of the highest mark band. Where a response is not creditworthy, that is contains nothing of any significance to the mark scheme, or where no response has been provided, no marks should be awarded.

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
1	(a)		Equicrystalline/interlocking (1) Feldspar (1) Igneous (1) Granite (1)	4			4		2
	(b)	(i)	1 mark for each 3 points plotted correctly – 6 plots = 2 marks Max 1 mark if points are not joined up with a curved line	2			2	2	
		(ii)	Edge of intrusion **P** = rapid cooling (1) finer crystals (1) **or** centre of intrusion **Q** = slower cooling (1) coarser crystals (1)	2			2		
	(c)		It is a pluton (1) **Any three x (1) from:** • it is discordant • large scale • rounded/oval shape • It has a metamorphic aureole (do not credit baked margin) • coarse crystals • it is not mafic / it is silicic • it contains quartz/ it is granite / it doesn't contain augite or olivine			4	4		

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
	(d)		Rock Unit B is older/A is younger (1) Rock Unit B is the country rock which fell into Rock Unit A / it is an included fragment/accept reference to xenolith (1)		2		2		
			Question 1 total	**8**	**2**	**4**	**14**	**2**	**2**

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
2	(a)	(i)	Calcite (1)	1			1		1
		(ii)	**Any three x (1) from:** • rounded / high sphericity • 1-1.5mm (allow one value or a range stated between 0.5-2mm) • medium sized • well sorted • oolitic/ooliths	3			3		3
	(b)	(i)	To scale (1) Correct shape (1) Detail of septa (1)		3		3	1	3
		(ii)	Coral (1)	1			1		
	(c)		**Indicative content** **Cold – false** • warm waters for $CaCO_3$ to precipitate • corals live in tropical waters / 23-29°C **Low energy – false** • medium sized grains • require medium/high energy to be transported • coral needs medium/high energy for oxygenated waters/circulation of nutrients			6	6		

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
			Shallow – true • needs to be shallow for $CaCO_3$ to precipitate • shallow for light to penetrate for algae within coral • shallow to be affected by waves • shallow for rounded grains to be transported back and forth **Marine – true** • modern corals only live in marine environments • wave action for transport of ooliths / rounded grains • the calcium carbonate is derived from marine shells **5-6 marks** There is a clear response which draws upon the interpretation of a **minimum of three** of the four points (cold, low energy, shallow, marine). Explanations are developed from both Figure 2a and 2b. The sources of evidence are interpreted coherently as outlined in the indicative content above. Conclusions/evaluations are made that supports the views that have been argued. *There is a sustained line of reasoning which is coherent, substantiated and logically structured. The information included in the response is relevant.*						

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
			3-4 marks The response draws upon the interpretation of a **minimum of two** of the four points (cold, low energy, shallow, marine). The sources of evidence are interpreted quite well as outlined in the indicative content above. There is some attempt at an evaluation of the evidence. A conclusion is drawn that supports the view that has been argued. *There is a line of reasoning which is partially coherent, supported by some evidence and with some structure. Mainly relevant information is included but there may be some irrelevant information or minor errors.* **1-2 marks** The response makes use of the interpretation of only **one or two** of the four points (cold, low energy, shallow, marine) with rather superficial comment. There may be a lack of relevance in places. There is little evidence of evaluation, although there may be a conclusion that supports the view that has been argued. *There is a basic line of reasoning which is not coherent, supported by limited evidence and with very little structure*. *There may be significant errors or the inclusion of much irrelevant information.* **0 marks** *No attempt made or no response worthy of credit.*						

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
	(d)		**Any two x (1) from:** • heat from the pluton • recrystallised • contact metamorphism • Fig 2d is marble		2		2		2
			Question 2 total	**5**	**5**	**6**	**16**	**1**	**9**

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
3	(a)	(i)	Hardness (1) Lustre (1) Dull / Metallic (1) Streak (1) Red / brown (1)		5		5		5
		(ii)	Haematite (1)	1			1		1
	(b)		Quartz (1)	1			1		1
	(c)		6000-400/400 or any use of 5600 (1) 14:1 or 5600:400 or 56:4, credit other acceptable ratios (1)		2		2	2	
	(d)	(i)	Formed in the fault (1) **Any one x (1) from:** • hydrothermal fluids • from granite / country rock		2		2		
		(ii)	**Any two x (1) from:** • magnetic survey/magnetometer • haematite/iron is magnetic • above average concentration of magnetic mineral / produces a positive anomaly Credit description of other sensible alternatives – e.g. ground penetrating radar, up to 2 marks.	2			2		

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
	(e)		Limestone – aggregate in construction / steel industry Uranium – energy generation Haematite – steel industry 3 correct = 2 marks, 2 or 1 correct = 1 mark, 0 correct = 0 marks	2			2		
			Question 3 total	**6**	**9**	**0**	**15**	**2**	**7**

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
4	(a)		To scale and drawn free-hand (1) Vein K cut by vein J and vein L (1) Vein J cuts vein L and K (1)		3		3	1	3
	(b)		Veins in correct order (1) Rock Unit F older than the veins (1) Rock Units A and B older than F (1) Rock Unit B older than A (1) Youngest Vein J Vein L Vein K Rock Unit F Rock Unit A Oldest Rock Unit B		4		4		4
			Question 4 total	**0**	**7**	**0**	**7**	**1**	**7**

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
5	(a)		West (1) North-south (1)	2			2		2
	(b)		It is a synform because the limbs dip towards the centre (1) Inclined because the limbs have an unequal dip / unequal width of outcrop (1)		2		2		
	(c)		Any bed dipping at 30° from the surface (credit 25°-35°) (1) Beds on both sides of F1 dipping towards west (X) from the correct surface plots (1) Fault dipping at 70° (credit 65-75) (1) Fault dipping to the west (to X) (1) Rock Unit C stops at fault (1)		5		5	5	5
	(d)		Compression (1) Hanging wall upthrown or footwall downthrown / it is a reverse fault (1)		2		2		
			Question 5	**2**	**9**	**0**	**11**	**5**	**7**

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
6	(a)		Coarse grained / reference to size (1mm -125mm) (1) Rounded / low sphericity (1)	2			2		2
	(b)	(i)	20 (1)	1			1	1	
		(ii)	**Random** Not random because majority N-S (1) **High Energy River** **Any two x (1) from:** • coarse particles moved by high energy/river current • rounded clasts indicate high energy river attrition/abrasion (must reference 'erosion' in some form) • high energy/river could align the particles • unable to confirm as a river • could be marine **From the South** Could have been from the south or the north/ cannot tell from this data (1)			4	4		
	(c)	(i)	Height of 3 bars correct (1) Accuracy/quality of plot (1)	2			2	2	
		(ii)	Well sorted (1)		1		1		

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
	(d)		**Any three x (1) from:** • large scale cross bedding – wind-blown in sand dunes • size 0.5mm/medium could be moved by wind • rounded grains – due to attrition and abrasion by wind • well sorted – size selected by wind • red cement/haematite – oxidised, terrestrial therefore supports aeolian transport • grains all composed of quartz – hard, no cleavage, softer minerals destroyed by high energy transport by wind		3		3		
			Question 6	**5**	**4**	**4**	**13**	**3**	**2**

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
7			Site 1 has lower risk than site 2 (1) **Three x (1) but max 2 for any one site from:** **Site 1:** • impermeable shale • slow flow of leachate into the groundwater • leachate contained within the synform **Site 2:** • limestone is permeable / jointed • faster flow of leachate into the groundwater • close to fault therefore leakage of leachate • leachate dissolves limestone causing subsidence / cavities			4	4		
			Question 7 total	**0**	**0**	**4**	**4**	**0**	**0**
			Paper totals	**26**	**36**	**18**	**80**	**14**	**34**