GCE AS MARKING SCHEME

SUMMER 2019

AS (NEW)
GEOLOGY - COMPONENT 1
B480U10-1

INTRODUCTION

This marking scheme was used by WJEC for the 2019 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.

GCE AS GEOLOGY

SUMMER 2019 MARK SCHEME

COMPONENT 1 - GEOLOGICAL ENQUIRIES

Instructions for examiners of A Level 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 Annotated diagrams

Where a candidate has answered a question wholly or partly by use of an annotated diagram, credit must be awarded to the annotations which form credit-worthy responses as outlined in the marking details box. Candidates must be credited only once for valid responses which appear both as annotations to diagrams and within a section of prose in the answer to the same question.

4. 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)	(i)	Olivine (1) Colour (olive-green) (1)		**2**		**2**		**2**
		(ii)	Measure area of picture as 25cm^2 (5x5cm) (1) Calculate 23.8/25 x100 = 95.2% (1)		**2**		**2**	**2**	**2**
		(iii)	Peridotite (1)	**1**			**1**		
	(b)		One rate of cooling as all the crystal sizes are similar (1) Crystal sizes are large (over 3mm) so formed deep underground (1)	**2**			**2**		

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
	(c)		Test for cleavage - mica has 1 (basal) and augite has 2 at 90 /Mica is flaky whereas augite is not (1) Identify Hardness test (explain use of finger nail, copper coin and steel pin) (1) Mica is 2.5-3 (so scratched by copper coin or steel pin) but augite is 5-6 so would not be scratched by copper coin or steel pin (1) Alternatively credit up to 3 marks for: Lustre: Mica has pearly lustre, augite is vitreous or Streak: Mica has a white streak, augite scratches the streak plate. or Crystal shape: Mica has platy crystals, augite has prismatic crystals.	**2**		**1**	**3**		**3**
			Question 1 total	**5**	**4**	**1**	**10**	**2**	**7**

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
2.	(a)	(i)	Identifying bed 2 as a shale and placing in “fine” for 50cm starting at 50cm and stopping at 100cm (1) Bed 3 starting medium at the top of bed 2 and coarsening upwards to coarse at 250cm (1) Bed 4 starting at 250cm and stopping at 325cm within “medium” throughout (1) Bed 5 starting at 325cm and stopping at 350cm within “fine” throughout (1)	**4**			**4**		**4**
		(ii)	Shale (1)		**1**		**1**		**1**
	(b)		Goniatite (1) Pointed lobes and rounded saddles/simpler suture lines/goniatitic suture lines (1)		**2**		**2**		

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
	(c)		**Indicative content** Identification of coal forming on land, within a delta swamp Discussion of coarsening upward sequence in bed 3 representing a delta sequence (may refer to tops sets, fore sets etc) Photograph 2 contains plants that would have formed on land Plant could not be marine so indicates swamp/low energy non-marine or transported further downstream Shale usually forms in low energy environments but delta can vary in energy levels Rock specimen B could have formed as a result of flocculation with contact between salt in sea and ions allowing deposition Sandstone has ripples (symmetrical) in photograph 3 - formed by coastal processes on a beach/edge of delta/coastline Could be beach along the delta (ripples would support this) Cross-bedding sandstone and conglomerate - suggest beach and wave action Shale could be a swamp deposit Goniatite shows marine so must be formed in sea water (so cannot be from further upstream) **5–6 marks** There is a clear response which describes and explains in detail many of the processes involved in the transportation and deposition of these samples in a marine delta. A logical sequence of the processes is clearly developed in the order transportation, structure formation and deposition. This response has implicit links to uniformitarianism. *There is a sustained line of reasoning which is coherent, substantiated and logically structured. The information included in the response is relevant.*			**6**	**6**		

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
			3–4 marks The response describes and explains many of the processes involved in the transportation and deposition of these samples in a marine delta. A logical sequence of the processes is developed in places but not throughout. *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 describes and explains only a few of the processes involved. There is a lack of detail in the response and comment is rather superficial. There may be a significant lack of relevance in places. *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 2 total	**4**	**3**	**6**	**13**	**0**	**5**

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
3.	(a)		Drawn to correct scale (1) Shape of leaves (1) Arrangement of leaves on stem (1)		**3**		**3**	**1**	**3**
	(b)		Divide scale fig 3/scale of photo 2 so 5/2 (1) Answer 2.5 (1)		**2**		**2**	**2**	**2**
			Question 3 total	**0**	**5**	**0**	**5**	**3**	**5**

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
4.	(a)		**Salty Taste - Description of test** Lick the mineral (1) **Hardness Test- Description of test/observation** Scratch with finger nail or copper coin (1) **Hardness test- Result of the test** Mineral will scratch with copper coin or finger nail (1) (also credit observing cleavage/crystal shape, colour or transparency(1) and correct result (1))		**2**	**1**	**3**		**3**
	(b)		Halite (1)		**1**		**1**		**1**
			Question 4 total	**0**	**3**	**1**	**4**	**0**	**4**

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
5.	(a)		Chiastolite crystals drawn to scale (1) Chiastolite crystals drawn as needles/long rectangles or as small squares in cross section (1) Chiastolite crystals drawn with random orientations (1)		**3**		**3**	**1**	**3**
	(b)		5 correctly identified in the box (1) Chiastolite indicates contact metamorphism or chiastolite forms in a metamorphic aureole (1) Rock Unit B contains shale (specimen B) which is a shale and when metamorphosed forms chiastolite (1)			**3**	**3**		**3**

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
	(c)		**Any four x (1) from**: • Identifies a transect as the most suitable sampling method • Transect not parallel to edge of intrusion (moving away from the intrusion aureole) • Reference to distance to travel (50-75m)/transect will need to be full length of aureole to fully test hypothesis • Reference to frequency of samples e.g. sample every 10 metres • Student may suggest multiple transects to ensure accuracy or that hypothesis conforms to whole aureole, not just one area • Random sampling acceptable if discussion of recording locations noted **Annotations that demonstrate these points should be credited**			**4**	**4**	**2**	**4**
			Question 5 total	**0**	**3**	**7**	**10**	**3**	**10**

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
6.	(a)		F1 upwards (1) 70-85° (Accept 51-89°) (1) reverse (1) F2 reverse (1)		**4**		**4**		**4**
	(b)		**F2** is older than the unconformity but younger than **Specimen K** (1) **F1** is younger than the unconformity and **F2** (1)		**2**		**2**		**2**
			Question 6 total	**0**	**6**	**0**	**6**	**0**	**6**

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
7.			**Any twelve x (1) from**: Correct plot of pluton Metamorphic Aureole F1 at correct location and direction F2 at correct angle and direction Base of unconformity over synform between F1 and F2 Base of E and F above unconformity SE of F1 Fold axes correctly drawn and labelled (1) NW limb of synform (boundaries of B-C in correct location and dipping at 30° towards Y) SE limb of synform (boundaries of B-C and B-A in correct location and dipping at 60° towards X) NW limb of antiform (boundaries of B-C and B-A in correct location and dipping at 60° towards X) SE limb of antiform (boundaries of B-C in correct location and dipping at 30° towards Y) Correct cross-cutting relationship of unconformity with F1 and F2 Arrows to show movement correctly on both faults		**9**	**3**		**12**	**12**
			Question 7 total	**0**	**9**	**3**	**12**	**12**	**12**
			Totals	**9**	**33**	**18**	**60**	**20**	**49**