GCE AS MARKING SCHEME

SUMMER 2022

AS
GEOLOGY - COMPONENT 1
B480U10-1

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.

GCE AS GEOLOGY

COMPONENT 1 - GEOLOGICAL ENQUIRIES

SUMMER 2022 MARK SCHEME

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.

Specimen A= Granite, Specimen D= Sandstone, Specimen E = trilobite

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
1	(a)	(i)	**Any one x (1) from:** • large body • non-linear igneous body • metamorphic aureole	**1**			**1**		**1**
		(ii)	**Any one x (1) from:** • coarse crystals • discordant • wide metamorphic aureole (only credit if not used in ai)		**1**		**1**		**1**

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
	(b)		Test/observation: Observe fracture/cleavage (1) **or** observe colour (1) Result Quartz has no cleavage/has conchoidal fracture whereas feldspar has 2 cleavage planes at 90° (1) **or** Quartz is colourless or appears grey/feldspar is white or cream (1) Test/observation Scratch test using copper coin and/or steel pin (1) **or** observe colour (1) **or** observe cleavage (1) **or** observe lustre (1) Result Mica scratches with copper coin/steel pin, feldspar does not scratch with copper coin/steel pin (1) **or** mica is brown, feldspar is white/cream (1) **or** mica has one cleavage plane, feldspar has 2 at 90 degrees (1) **or** feldspar is vitreous and mica is pearly (1)		**2**	**2**	**4**		**4**
	(c)	(i)	Discordant feature (1) Linear (1)	**2**			**2**		**2**
		(ii)	**Any one x (1) from**: • olivine • augite	**1**			**1**		
		(iii)	Peridotite is ultramafic (1) Partial melting of ultramafic material produces a mafic rock (1)	**2**			**2**		

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
	(d)	(i)	Rank the crystal sizes in order (1) Find lower and upper quartile rank (3rd and 8th= 5 and 27) (1) Interquartile range = 22 (1)		**3**		**3**	**3**	**3**
		(ii)	4 larger crystals and group of smaller crystals/porphyritic (1) Larger crystals take longer to form/smaller crystals form more quickly (1)	**2**			**2**		
		(iii)	**Any two x (1) from:** • reference to the ineffectiveness of both • reference to interquartile range being more effective than standard deviation • both demonstrate the distribution of the grain sizes • both hide the bimodal characteristics of Rock Unit A • interquartile range only uses the central 50% of the data so removes potential anomalies • standard deviation shows how much data is clustered around a mean value • standard deviation assumes a normal distribution pattern but rock unit A does not- reference to large phenocryst			**2**	**2**		
			Question 1 total	**8**	**6**	**4**	**18**	**3**	**11**

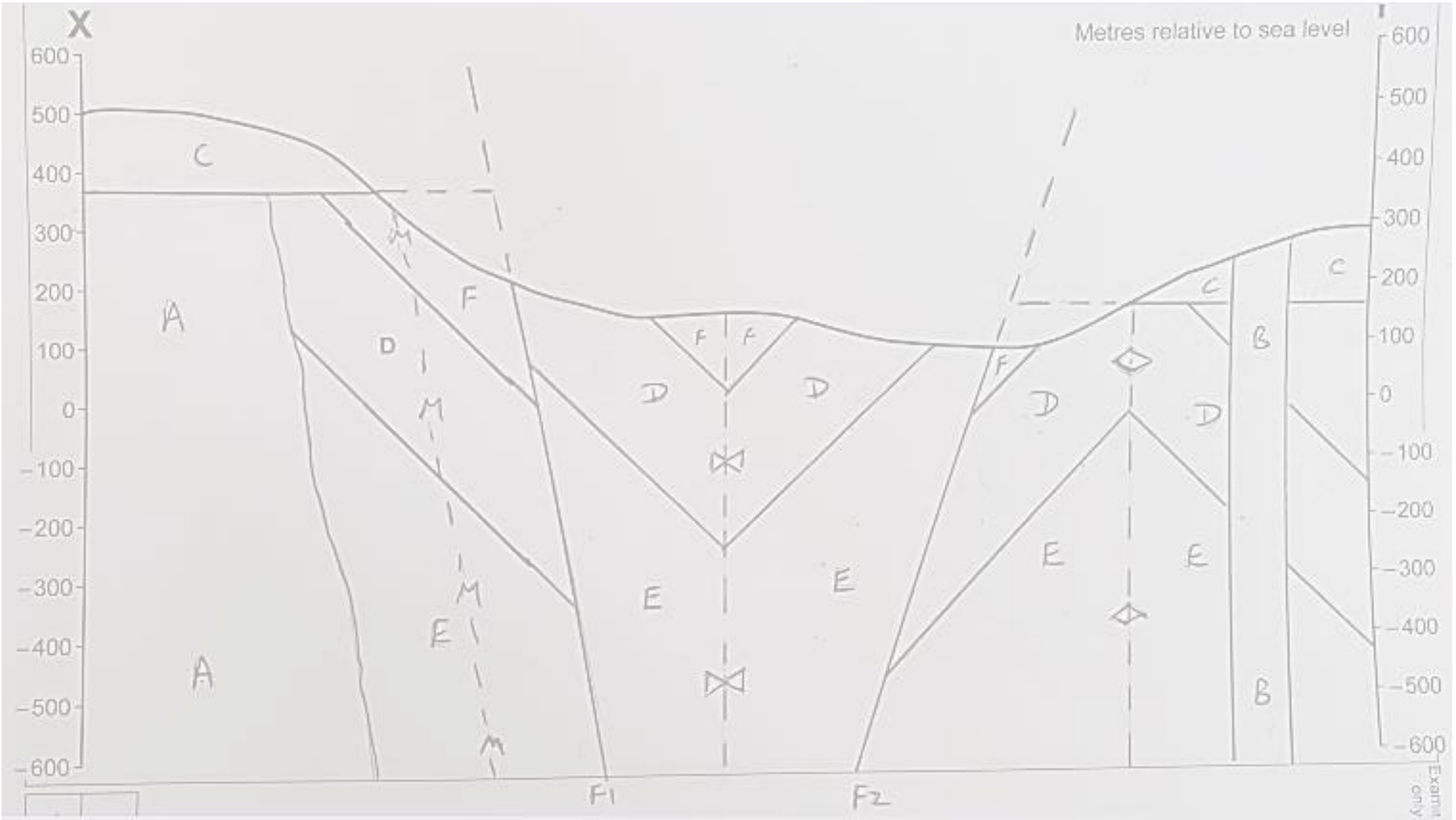
Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
2	(a)		Grains drawn rounded/subrounded (1) Size of grains medium (between 0.5mm and 2mm) (1) Well sorted (1)		**3**		**3**	**1**	**3**
	(b)		Sandstone (orthoquartzite) (1) Medium grained or reference to numbers within 0.5 -2mm (1) Composed mainly of quartz (1)		**3**		**3**		**3**
			Question 2 total	**0**	**6**	**0**	**6**	**1**	**6**

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
3	(a)	(i)	Drawn to correct scale (1) Shape (1) Detail (1)		**3**		**3**	**1**	**3**
		(ii)	Correctly labelled glabella (1)	**1**			**1**		**1**
	(b)		Tick 3b (1) **Any three x (1) from:** • Figure 3b most likely to be formed by trail of the organism • Figure 3b correct shape and scale to be formed by organism • Figure 3c is correct scale but ripple marks formed by water oscillations, not formed by organic matter • Figure 3d is too large and scale unlikely		**4**		**4**		**4**
			Question 3 total	**1**	**7**	**0**	**8**	**1**	**8**

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
4	(a)		Unconformity labelled correctly on Map 2 (1)	**1**			**1**		**1**
	(b)		Schist (1) **Any two x (1) from:** • schistocity in the rock/foliation visible • garnets present • groundmass medium (1-2mm)		**3**		**3**		**3**
	(c)		**Indicative content** Clast is older than rock unit C so cannot have come from rock unit C. Age alone- reference to the specimen coming from rock units A, D and F. Clast is made of schist, a regional metamorphic rock. This requires heat and pressure. Other rocks in the area show no signs of being regionally metamorphosed. Specimen D is a sandstone/sedimentary rock. Rock unit F is younger than D and so cannot be regionally metamorphosed. Only evidence of metamorphism is the contact metamorphism of the aureole. This would not create foliation. No evidence of regional metamorphism on Map 2 (foliation indicators). Rock Unit A is igneous.			**6**	**6**		

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
			5-6 marks This response relates to **all of** relevant age relationships, rock types and type of metamorphism. Response has strong explanation and description. *There is a sustained line of reasoning which is coherent, substantiated and logically structured. The information included in the response is relevant.* **3-4 marks** This response relates to at **least two** of relevant age relationships, rock types and type of metamorphism. Response lacks full explanation, focusing more on description. *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 refers to at **least one** of relevant age relationships, rock types or type of metamorphism. *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 4 total	**1**	**3**	**6**	**10**	**0**	**10**

Question			Marking details			Marks Available					
						AO1	AO2	AO3	Total	Maths	Prac
5			**F1** Upwards (1) Reverse (1)	**F2** West (1)	**F3** 45° or less (1) Thrust (1) (credit reverse if greater than 45°)		**5**		**5**		**5**
			Question 5 total			**0**	**5**	**0**	**5**	**0**	**5**



Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
6			Dyke vertical (1) F1 at correct location, angle and direction (1) F2 at correct location and angle (1) Base of unconformity to west correct location and dip (1) Base of unconformity to east correct location and dip (1) Correct plot of pluton (1) Metamorphic aureole (1) Between F1 and F2: W limb of synform (boundaries of F-D and D-E in correct location and dipping at 45° towards Y) (1) Between F1 and F2: E limb of synform (boundaries of F-D and D-E in correct location and dipping at 45° towards X) (1) To East of F2: W limb of antiform (boundaries of F-D and D-E in correct location and dipping at 45° towards X) (1) To East of F2: E limb of antiform (boundaries of F-D and D-E in correct location and dipping at 45° towards Y) (1) Synform and antiform axes correctly drawn and labelled (1) Correct cross-cutting relationship of F2/F1 and unconformity (1)		**8**	**5**	**13**	**13**	**13**
			Question 6 total	**0**	**8**	**5**	**13**	**13**	**13**
			Totals	**10**	**35**	**15**	**60**	**18**	**53**