Surname

Centre Number Candidate Number

2

Other Names

GCE AS/A Level – LEGACY

wjec

1212/01

S18-1212-01

GEOLOGY – GL2a Investigative Geology

WEDNESDAY, 25 APRIL 2018 - MORNING

1 hour 30 minutes

	For Examiner's use only		
	Question	Maximum Mark	Mark Awarded
	1.	8	
	2.	9	
	3.	5	
imination paper, you will need:	4.	6	
nd E ;	5.	12	
ent for testing specimens;	6.	4	
neet;	7.	12	
	8.	4	
	Total	60	

ADDITIONAL MATE

In addition to this exa

- the Resource Sheet
- Specimens A, B, ar
- · geological equipme
- · the Mineral Data Sh
- a protractor.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Answer all questions.

Write your name, centre number and candidate number in the spaces at the top of this page.

Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES

The geology is **not** designed to represent any particular area.

The Mineral Data Sheet and Map 1 and Photographs 1 to 3 are provided on separate resource sheets.

These are **not** required by the examiner.

Strips of plain paper may be obtained from the supervisor on request. The strips are **not** required by the examiner.

Three specimens, A, B, and E, are provided for use.

Specimens A, B, and E may be tested with the equipment specified by the supervisor.

The number of marks is given in brackets at the end of each question or part-question.

Marking will take into account the quality of communication used in your answers.

1.

Answer all questions in the spaces provided. Study Map 1 on the Resource Sheet carefully before answering Questions 1-8. Specimen A and photograph 1 on page 4 of the resource sheet are representative of Rock Unit A on Map 1. The list below contains statements about **Rock Unit A**. Select the **three** statements which (a) best apply to Rock Unit A. [3] Tick (✓) only three boxes It is poorly sorted It is crystalline • It is the product of fluvial processes • It formed by slow cooling • It is porous It is coarse grained • It is the product of aeolian processes • It is well sorted It is the product of marine processes •

Examiner only

(b) Specimen A is dominated by two minerals. Giving a reason for each mineral, state the names of these two minerals. You may wish to use the equipment provided by the supervisor and to refer to the Mineral Data Sheet. [4]

Mineral 1	
Name	
Reason	
 Mineral 2	
Name	
Reason	

(c) Photograph 1 on page 4 of the resource sheet shows structure J found within Rock Unit A on Map 1. A student correctly identified that the paleocurrent direction that formed this structure was towards the north-west. Use this information to select the most likely compass direction the camera was pointing towards when the photograph was taken. Tick (J) one box below with your answer. [1]



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•••••

(a)	Draw a scaled, internal diagram of Specimen B.	
1-/	Label on your diagram two hard parts of this fossil group.	[4]
	cm	
(h)	Name, giving a reason the fossil group represented by Specimen B	21
~)		
	Name of fossil group	
	Reason	

Examiner only A student suggested that "*Rock Units A and B formed at the same time in different environments*". (C) [3] Evaluate this statement with reference to: Map 1 • Photograph 1 • Specimen A • Specimen B • 9

> 1212 010005

(1212-01)

Examiner only Map 1 shows the outcrop of Rock Unit C. With reference to the evidence in Map 1 only, indicate by ticking the relevant box, the (a) most likely type of igneous body represented by Rock Unit C. Give two reasons for your answer. [3] lava flow dyke sill pluton Reason 1 Reason 2 Photograph 2 on page 4 of the resource sheet shows structure M found within Rock (b) Unit C on Map 1 at Locality I. Identify structure M and suggest how it formed. [2] Name of structure Explanation of how it formed

5

6

3.

7



Turn over.

Examiner only

5. Map 2 shows the outcrop pattern in **Box B** on **Map 1**. The key is the same as that for **Map 1**.

8





(a) Refer to Map 1 and Map 2. The base of Rock Unit B has been displaced by Faults F1 and F2. Calculate the vertical displacement of Rock Unit B caused by Fault F1. [1]

Vertical displacement =

(b) Refer to Map 1 and Map 2.
 State the types of fault represented by faults F1 and F2 by completing Table 5. For each fault state the evidence that enables this classification to be made.

Fault	Type, tick (✓) one box for each fault		Evidence
F1	Dip-slip	Strike–slip	•
F2	Dip-slip	Strike–slip	•

Table 5

(c) Fault F1 on Map 1 has a dip of 90° (vertical dip). A student classified the fault as being a normal fault. Evaluate this statement giving reasons for your answers. [2]

9



(d) In the spaces below, complete the sequence of geological events represented in the area of Box B on Map 1 in order of age, *oldest at the base*. Rock Units A, D and H have been inserted.

Complete the boxes below in order of age by using the appropriate **Rock Unit** letters given in the key to **Map 1**.

Clearly mark and label with horizontal arrows the position of Fault F1 and Fault F2:

◄ Fault F1
◄ Fault F2

YOUNGEST

[5]

Examiner only

Н

D

А



OLDEST

12

6.	(a)	Specimen E is representative of Rock Unit E on Map 1 . Giving a reas forming Specimen E .	son name the rock [2]
		Name of rock	
		Reason	
	(b)	A student correctly concluded that Rock Units H and E formed in a sin Select two boxes below to identify the properties of this environment.	milar environment. [2]
			Tick (✓) only two boxes
		Shallow lake	
		Tropical swamp	
		Deep tidal marine	
		Glacial lake	
		Tidal oxygenated marine	
		Non-tidal low oxygen marine	
		Shallow marine	
			4



Complete the sketch of the geological cross-section along this line using Map 1. • Draw the rock units. Use similar ornament, or letters, for those as on Map 1.

- Draw and label any fold axes, with the correct symbol.
 Project the rock units and structures above the ground surface to illustrate any cross-cutting relationships.



8. Sedimentary structures can be used as way up criteria.

Using an annotated diagram(s):

- Name **one** sedimentary structure which can be used to determine the way up of a sedimentary sequence.
- Show **how** your chosen sedimentary structure can be used to determine the way up of a sedimentary sequence.
- **Explain** the origin of your chosen sedimentary sequence.

Credit will only be awarded for answers which relate to **one** of the following. Tick (\mathcal{I}) **one** box to indicate your choice.

- Your fieldwork observation of **one** rock exposure.
- **Photograph 1** (on page 4 of the Resource Sheet) which is representative of **Rock Unit A** on **Map 1**.

An annotated diagram(s) **must** be used in your answer.

[4]

END OF PAPER

Examiner only