



2014 Geology

Intermediate 2

Finalised Marking Instructions

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Part One: General Marking Principles for Geology Intermediate 2


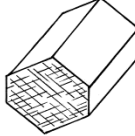
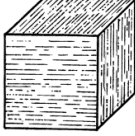
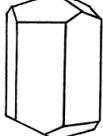
This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the specific Marking Instructions for each question.

- (a)** Marks for each candidate response must always be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question. If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from your Team Leader/Principal Assessor.
- (b)** Marking should always be positive ie, marks should be awarded for what is correct and not deducted for errors or omissions.

GENERAL MARKING ADVICE: Geology Intermediate 2

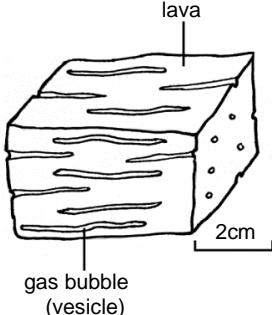
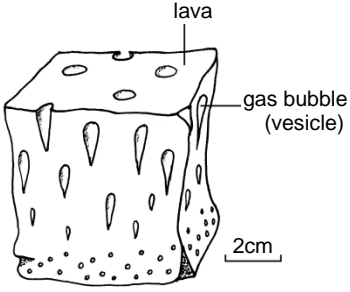
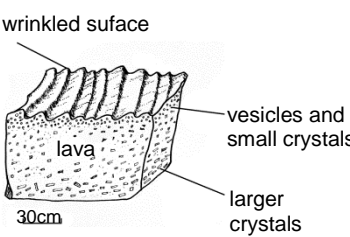
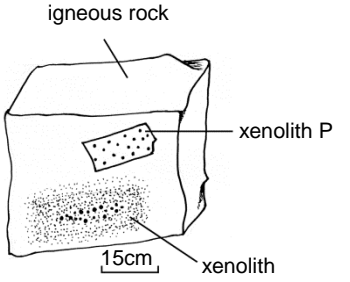
The marking schemes are written to assist in determining the “minimal acceptable answer” rather than listing every possible correct and incorrect answer. The following notes are offered to support Markers in making judgements on candidates’ evidence, and apply to marking both end of unit assessments and course assessments.

Part Two: Marking Instructions for each Question

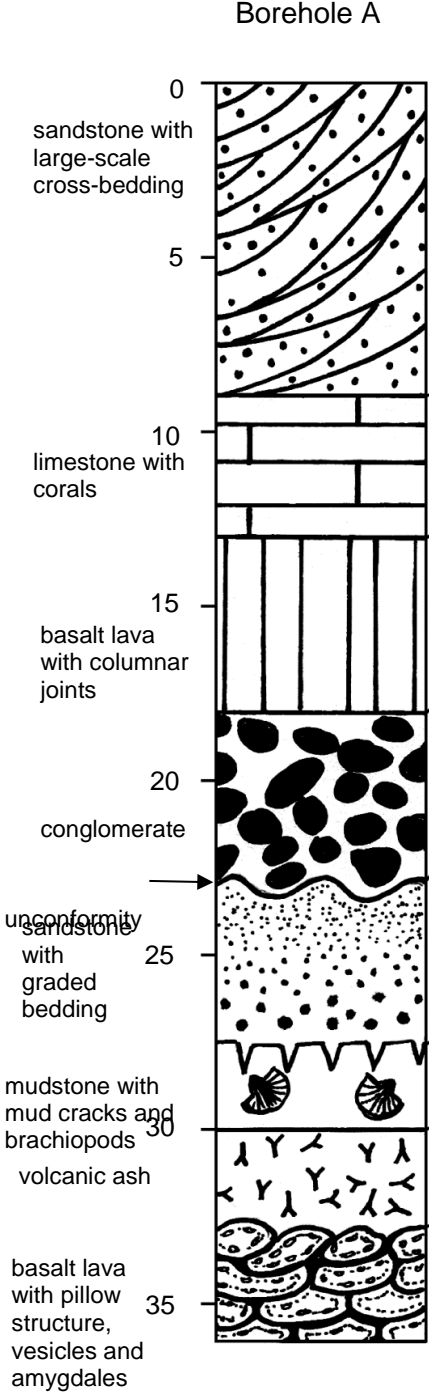
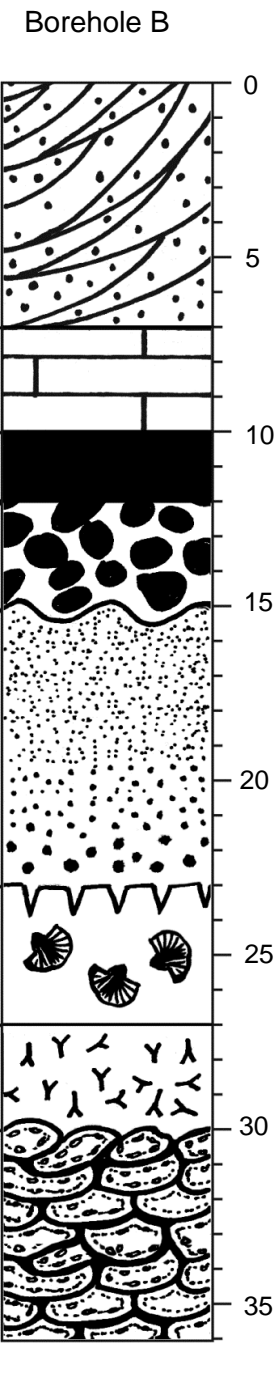
Question		Expected Answer(s)	Max Mark	Additional Guidance					
1.	(a)		4						
				<i>Crystal Shape</i>	<i>Hardness</i>	<i>Relative density</i>	<i>Lustre</i>	<i>Reaction with acid</i>	<i>Name of mineral</i>
					7	2.75	glassy	none	quartz
					5.5	3.3	glassy	none	amphibole
					2.5	7.5	metallic	smell of rotten eggs	galena
					3	2.7	glassy	fizzes	calcite
		<p>All 8 correct = 4 marks, 6 or 7 = 3, 4 or 5 = 2, 2 or 3 = 1, 1 correct = 0 marks.</p>							

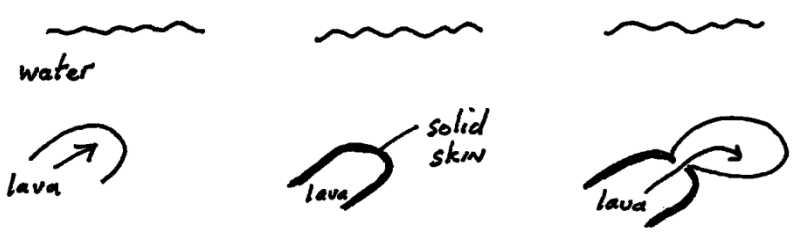
Question	Expected Answer(s)	Max Mark	Additional Guidance
1. (b)	<p style="text-align: center;">Crystalline rock</p> <pre> graph TD CR[Crystalline rock] --> MA[Minerals aligned] CR --> MNA[Minerals not aligned] MA --> CGA[Coarse-grained. The original rock was granite] MA --> MGA[Medium-grained. The original rock was mudstone] CGA --> CGA_Box[Name: gneiss] MGA --> MGA_Box[Name: schist] MNA --> CGN[Coarse-grained] MNA --> FG[Fine-grained] CGN --> CGN_30[about 30% quartz] CGN --> CGN_NoQ[No quartz] CGN_30 --> CGN_30_Box[Name: granite] CGN_NoQ --> CGN_NoQ_Box[Name: gabbro] FG --> FG_50[About 50% pyroxene] FG --> FG_NoP[No pyroxene, often shows flow banding] FG_50 --> FG_50_Box[Name: basalt] FG_NoP --> FG_NoP_Box[Name: rhyolite] </pre>	3	<p>All 6 correct = 3 marks, 4 or 5 correct = 2, 2 or 3 correct = 1, 1 correct = 0 marks.</p>

Question		Expected Answer(s)	Max Mark	Additional Guidance										
1.	(c)		2											
		<table border="1"> <thead> <tr> <th><i>Description of rock</i></th> <th><i>Name of rock</i></th> </tr> </thead> <tbody> <tr> <td>Made up of angular boulders, pebbles or gravel.</td> <td>breccia</td> </tr> <tr> <td>Organic, formed from the skeletons of tiny floating algae.</td> <td>chalk</td> </tr> <tr> <td>Evaporite deposit of sodium chloride.</td> <td>rock salt</td> </tr> <tr> <td>Organic, formed from the remains of land plants, high carbon content.</td> <td>coal</td> </tr> </tbody> </table>			<i>Description of rock</i>	<i>Name of rock</i>	Made up of angular boulders, pebbles or gravel.	breccia	Organic, formed from the skeletons of tiny floating algae.	chalk	Evaporite deposit of sodium chloride.	rock salt	Organic, formed from the remains of land plants, high carbon content.	coal
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		<p>All 4 correct = 2 marks, 2 or 3 correct = 1 mark, 1 correct = 0 marks.</p>												

Question	Expected Answer(s)	Max Mark	Additional Guidance
2.	<p style="text-align: center;">Diagram</p> 	<p style="text-align: center;">Question</p> <p>Explain why the vesicles are very long and thin.</p>	<p style="text-align: center;">Possible explanation</p> <p>They have been stretched as the lava flows.</p> <p style="text-align: right;">1</p>
		<p>Explain why the upper vesicles are tear-drop shaped.</p>	<p>As they rise they develop this streamlined shape because it offers least resistance</p> <p style="text-align: right;">1</p>
		<p>Explain why the top of the lava flow is uneven.</p>	<p>The lava at the base was still moving as the top cooled and crystallised. The lava skin then formed ripples as it was pulled in that direction by the lava underneath.</p> <p style="text-align: right;">1</p>
		<p>Explain why xenolith Q seems to have been carried from a greater depth than xenolith P.</p>	<p>It is more broken down/ absorbed/melted which indicates that it has spent a longer time in the magma.</p> <p style="text-align: right;">1</p>
	<p>1 mark for each correct explanation.</p>		

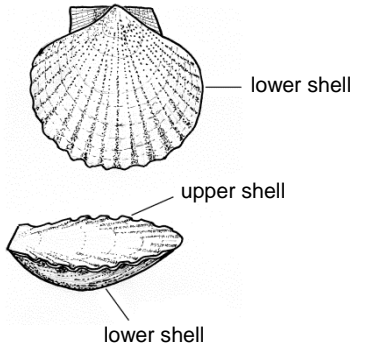
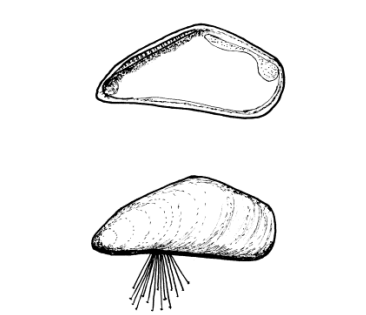
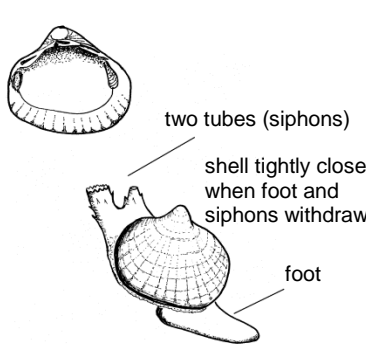
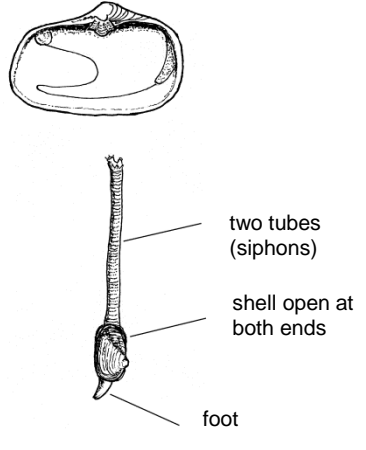
Question		Expected Answer(s)	Max Mark	Additional Guidance															
3.	(a)	anticline	1																
3.	(b)	an unconformity	1																
3.	(c)	D	1																
3.	(d)	<p>B -> D -> E -> C -> F -> A oldest youngest</p> <p>All 6 correct = 3 marks, 4 or 5 in correct sequence = 2, 3 in correct sequence = 1.</p>	3																
4.	(a)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><i>Site Number</i></th> <th style="text-align: center;"><i>Possible Hazard</i></th> <th style="text-align: center;"><i>How risk could be reduced</i></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">Rock fall / fall in river</td> <td style="text-align: center;">Wear hard hat / tough outer clothing Avoid river edge / wet slopes</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">Cut off by tide / Slip on rocks</td> <td style="text-align: center;">Read tide times / Sturdy footwear</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">Rock fall / cut off by tide</td> <td style="text-align: center;">Hard hat / Have first aid kit / mobile phone</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">Cliff fall / Bad weather / poor visibility</td> <td style="text-align: center;">Avoid edge / Know weather forecast</td> </tr> </tbody> </table> <p>Any reasonable risk reduction accepted All 4 rows correct = 2 marks 2 or 3 rows correct = 1 mark</p>	<i>Site Number</i>	<i>Possible Hazard</i>	<i>How risk could be reduced</i>	1	Rock fall / fall in river	Wear hard hat / tough outer clothing Avoid river edge / wet slopes	2	Cut off by tide / Slip on rocks	Read tide times / Sturdy footwear	3	Rock fall / cut off by tide	Hard hat / Have first aid kit / mobile phone	4	Cliff fall / Bad weather / poor visibility	Avoid edge / Know weather forecast	2	
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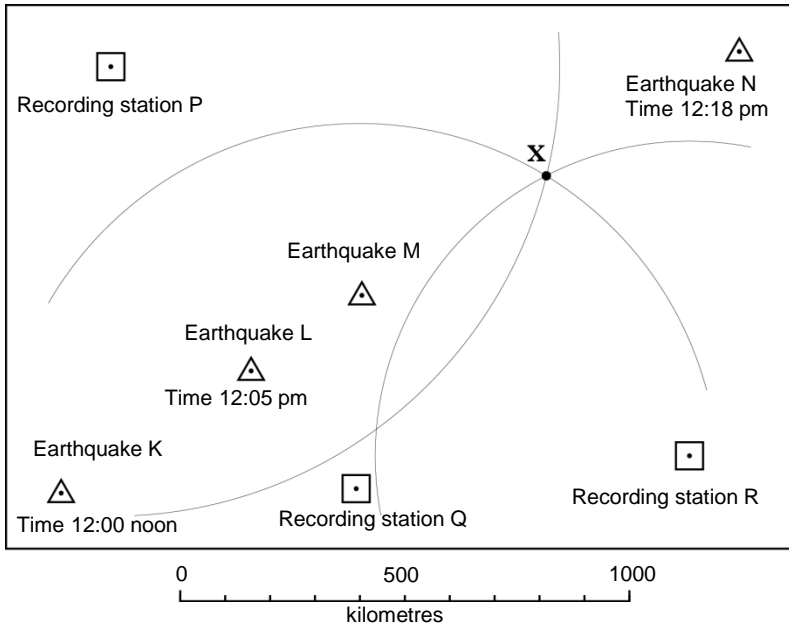
Question	Expected Answer(s)	Max Mark	Additional Guidance
4. (b)	<p style="text-align: center;">Borehole A</p>  <p style="text-align: center;">Borehole B</p>  <p style="text-align: right;">Depth (m)</p> <p>All 8 layers correct = 4 marks, 4-7 correct = 1 mark, otherwise 0 marks.</p>	4	
4. (c)	<p>7 or 8 lines correct = 2 marks 4 – 6 lines correct = 1 mark Less than 4 lines correct = 0 marks</p>	2	

Question		Expected Answer(s)	Max Mark	Additional Guidance
4.	(d)	<p>Assuming at least one correct diagram, then: 3 or 4 stages described = 3 marks 2 stages described = 2 marks, 1 stage described = 1 mark, If no diagram deduct 1 mark.</p> 	3	
4.	(e)	<p>B and F One mark each.</p>	2	

Question		Expected Answer(s)	Max Mark	Additional Guidance																											
5.	(a)		1	Both correct = 1 mark																											
		<table border="1"> <thead> <tr> <th rowspan="2">Height above river bed (m)</th> <th colspan="3">% share of mass at each height</th> </tr> <tr> <th>% sand</th> <th>% silt</th> <th>% clay</th> </tr> </thead> <tbody> <tr> <td>3.0</td> <td>52</td> <td>36</td> <td>12</td> </tr> <tr> <td>2.0</td> <td>58</td> <td>26</td> <td>16</td> </tr> <tr> <td>1.0</td> <td>75</td> <td>18</td> <td>7</td> </tr> <tr> <td>0.5</td> <td>84</td> <td>13</td> <td>3</td> </tr> <tr> <td>0.0</td> <td>84</td> <td>13</td> <td>3</td> </tr> </tbody> </table>	Height above river bed (m)	% share of mass at each height			% sand	% silt	% clay	3.0	52	36	12	2.0	58	26	16	1.0	75	18	7	0.5	84	13	3	0.0	84	13	3		
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5.	(b)			<p>height above river bed (metres)</p> <p>3.0 2.5 2.0 1.5 1.0 0.5 0</p> <p>0 10 20 30 40 50 60 70 80 90 100</p> <p>% of total mass at each height above the river bed</p> <p>4 or 5 plots = 1 mark</p>																											
5.	(c)	The higher above the river bed the greater the % mass of silt carried. (or the closer to the river bed the lower the % mass of silt is carried)	1																												
5.	(d)	There is more sand being carried in the water near the river bed and/or sand grains are bigger (heavier) than silt or clay particles.	1																												

Question		Expected Answer(s)	Max Mark	Additional Guidance
6.	(a)	<p>Fossil P – stem Fossil Q – ambulacral plate Fossil R – guard Fossil S – brachial valve Fossil T – suture Fossil U – septum</p> <p>All 6 correct = 3 marks, 4 or 5 correct = 2, 2 or 3 correct = 1, 1 correct = 0 marks.</p>	3	
6.	(b)	<p>P tree/plant Q sea urchin/echinoid R belemnite S brachiopod T gastropod U coral</p> <p>All 6 correct = 3 marks, 4 or 5 correct = 2, 2 or 3 correct = 1, 1 correct = 0 marks.</p>	3	

Question	Expected Answer(s)	Max Mark	Additional Guidance
6. (c)		4	
	<p align="center">Bivalve</p>	<p>Habitat (where it lives) choose a number from 1 - 4</p>	<p>Reason for choice of habitat</p>
		2	<p>This thin-shelled bivalve avoids predators by swimming. The flat rock provides a suitable place to settle when resting and feeding.</p>
		1	<p>Are able to attach to rocks by byssus/strong threads and hence survive in this habitat.</p>
		4	<p>Short siphons indicate a shallow burrower/the ability to tightly close its shells indicates that it lives in an area where it is open to attack such as just below the surface of sand.</p>
		3	<p>Long siphons indicate that it is a deep burrower/the inability to tightly close its shells indicates that there is less likelihood of attack by predators such as in deeper sand.</p>
<p>One mark for each correctly answered row.</p>			

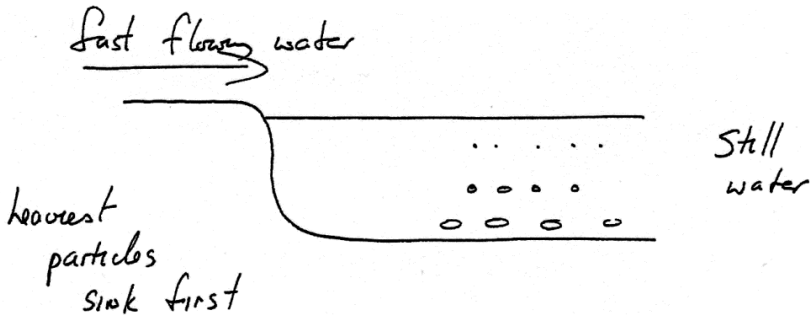
Question	Expected Answer(s)	Max Mark	Additional Guidance
7. (a)		2	
7. (b)	They lie along a fault line	1	
7. (c)	The rock snaps in different places and at different times along the fault line/plane.	1	
7. (d)	<p>Distance between K and N = 1800 km Time gap = 18 minutes – both for 1 mark (or other correct length and time gap)</p> <p>Rest of calculation = 1 mark</p> <p>M = 12:08pm (plus or minus 1 minute)</p>	2	
7. (e)	<p>Name: Seismometer/seismograph</p> <p>How it works:</p> <ul style="list-style-type: none"> • Earthquake shakes base • Pen remains still because the spring and heavy weight stabilize it • Drum rotates at a constant speed and the pen records the size of the waves on paper. <p>1 mark for correct name. All 3 correct = 2 marks, 2 correct = 1 mark, 1 correct = 0 marks.</p>	3	

Question		Expected Answer(s)	Max Mark	Additional Guidance														
8.	(a)	4	1															
8.	(b)		2															
<p>All 6 correct = 2 marks, 4 or 5 correct = 1 mark.</p>																		
8.	(c)		3															
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Question	Expected Answer(s)	Max Mark	Additional Guidance
8. (d)		3	
			<p>Depth of deepest earthquake (km)</p> <p>Rate of subduction (cm per year)</p> <p>Labelling axes with units = 1 Suitable scale (more than half graph paper used) = 1 Plotting points = 1 Best line fit also acceptable</p>
8. (e)	The faster the rate of subduction the greater is the depth of the deepest earthquake (or other way around).	1	
9. (a)	Buried in a mudslide/drowned in a flood event then covered by mud/driven off a cliff by predators and then buried by marine or swamp mud/killed by volcanic ash fall/poisoned by gasses released by volcanoes and then buried.	1	
9. (b)	They have survived attacks by predators.	1	
9. (c)	Many are hatched but die early.	1	
9. (d)	$\frac{200 - 20}{200} \times 100$ 90%	1	

Question		Expected Answer(s)	Max Mark	Additional Guidance
10.	(a)	Syncline	1	
10.	(b) (i)	Tear	1	
10.	(b) (ii)	Direction of movement: NW Distance moved: 100 metres	2	
10.	(c)	The mudstone outcrop on the NE side is narrower indicating greater erosion in the core of the syncline when uplift occurred or On the NE side the older rock limestone abuts the younger mudstone to the south of it. This indicates that the older rock has been lifted higher.	1	
10.	(d)		1	
10.	(e)		1	

Question		Expected Answer(s)	Max Mark	Additional Guidance
12.	(a)	B	1	
12.	(b)	D	1	
12.	(c)	oceanic crust 1: total of all layers below 910.	1	
12.	(d)	D	1	

Question		Expected Answer(s)	Max Mark	Additional Guidance
13.	(a)	<p>Limestone: Limestone dissolves in slightly acidic rainwater/limestone is prone to frost shattering because of its many joints</p> <p>Clay: When wet, clay flakes slide over one another easily and can therefore flow by gravity downwards.</p>	<p>1</p> <p>1</p>	<p>Accept any reasonable answer.</p> <p>For each rock any one correct statement on either weathering or susceptibility to rock falls gains 1 mark.</p>
13.	(b)	 <p>Fast flowing water carries a mixture of rock sizes (1) In the still water the finest sediments are slowest to sink (1)</p>	2	
13.	(c)	<p>Accept any possible structure eg:</p> <ul style="list-style-type: none"> • worm burrows • mud cracks • cross bedding • ripple marks • half filled shells • lava flow with vesicles and soil • unconformity with conglomerate <p>Name of structure – 1 mark, Diagram – 1 mark, Explanation – 1 mark.</p>	3	

[END OF MARKING INSTRUCTIONS]