

2012 Geology

Intermediate 2

Finalised Marking Instructions

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1. (a) Use eight of the mineral names from the word box to complete the table below.

amphibole : barite : cassiterite : chalcopyrite : fluorite : galena :

haematite : olivine : sphalerite : talc

Mineral properties	Name of mineral
Grey colour. Metallic lustre. Ore of lead.	galena
Glassy green colour. No cleavage. Hardness 6½.	olivine
Brassy yellow colour often with multi-coloured tarnish. Ore of copper.	chalcopyrite
Black or green-black colour. Two planes of cleavage at 60°. Hardness 5½.	amphibole
White or pale colour. One perfect cleavage. Hardness 1.	talc
White or pale colour. Three planes of cleavage. Feels very heavy in the hand – relative density 4½.	barite
Red-brown colour. Streak red-brown. Often forms kidney-shaped or rounded lumpy masses. Ore of iron.	haematite
Brown glassy mineral. Six planes of cleavage. Ore of zinc.	sphalerite

All 8 correct = 4 marks, 6-7 correct = 3, 4-5 correct = 2, 2-3 correct = 1



All 8 correct = 4 marks, 6-7 correct = 3, 4-5 correct = 2, 2-3 correct = 1



Any statement that suggests exponential decrease/rapid decrease then slowing down = 1 mark

Any statement that quotes figures to support description = 1 mark

2

Marks

4. Study the block diagram below.

			Marks
(d)	Place	the following geological events in the correct order from oldest to youngest.	
	А	Deposition of limestone	
	В	Formation of unconformity	
	С	Movement on fault F_1	
	D	Movement on fault F_2	
	Е	Intrusion of dyke	
	F	Folding of shale	
	Give	only the letters: $A \rightarrow F \rightarrow B \rightarrow C \rightarrow E \rightarrow D$	3
		oldest youngest	
	All 6 i 4 or 5 3 in c	in correct order = 3 marks in correct order = 2 marks orrect order = 1 mark	
(e)	Which one of the following statements is correct?		
	А	Columnar joints are formed when an igneous rock heats up and expands.	
	В	Sheet joints are formed when the weight of rock above a batholith is	
	C Mud cracks are a honeycombed pattern of cracks produced when mud		
	dries out and expands.		
	D	shattering.	
	Give	only the letter. B	1

5. The sketch below shows a variety of depositional environments.

(a) Match the sedimentary rock in the table below with its likely environment of deposition. Choose from environments P, Q, R, S or T.

Sedimentary Rock	Environment of Deposition
Salt deposits	Q
Mudstone	т
Coral limestone	R
Coal	S
Sandstone	Р

5 correct = 2 marks, 3 or 4 correct = 1 mark

(b) Which diagram below shows the type of sand grain formed in a desert environment?

Give only the letter. Α

2

1

They have hard exoskeletons/outer shells whereas worms are soft bodied

2

Reason: The outcrop of the mudstone is wider on this side indicating less erosion/the older sandstone abuts the younger mudstone.

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			Marks
(d)	What	type of intrusion is formed by igneous rock P?	
	batho	lith or stock	1
(e)	Place	the following events in the correct order from oldest to youngest.	
	А	Formation of igneous rock Q	
	В	Deposition of mudstone	
	С	Movement on fault F_1	
	D	Formation of igneous rock P	
	Е	Folding of rocks	
	F	Formation of igneous rock R	
	Give	only the letters: $\mathbf{B} \rightarrow \mathbf{E} \rightarrow \mathbf{C} \rightarrow \mathbf{D} \rightarrow \mathbf{F} \rightarrow \mathbf{A}$	
		oldest youngest	3
	All 6 4 or 5 3 in c	in correct order = 3 marks 5 in correct order = 2 marks orrect order = 1 mark	

		Marks
(a)	Name the type of valley shown.	
	Rift	1
(b)	Name the type of lava shown.	
	Pillow/basalt	1
(c)	The continents separated 80 million years ago. Using the scale, calculate the speed at which continents A and B have moved apart over this time. Give your answer in km per million years. Space for calculation:	
	4000 km in 80 million years 1 mark	
	4000/80 = 50 1 mark	
	50 km/million years	2
(d)	Using the borehole data, provide evidence that supports the idea that the joined continents drifted from polar to equatorial and then desert latitudes before separating.	
	Glacial deposits indicate very cold conditions possibly polar – 1	
	Coal indicates hot wet conditions possibly equatorial – 1	
	The fresh water fossils followed by salt deposits indicate a possible inland lake/sea that has evaporated or salt deposits indicate a desert – 1	3

2

(f) Which two statements correctly describe the internal structure of the Earth?

- A The Earth has a liquid metal inner core.
- B The Earth's crust is thicker than the mantle.
- C The Earth's crust is made of peridotite.
- D The Earth has a molten nickel and iron outer core.
- E P-waves and S-waves travel at the same speed through the outer core.
- F The Moho is a major discontinuity between the crust and the mantle.

Give only the letters: D and F

(d) The table below gives the height of a mountain over a 75 million year period.

Time	Height of mountain
(millions of years ago)	(km)
0	0.16
15	0.32
30	0.63
45	1.25
60	2.5
75	5.00

(i) Predict the height of the mountain in 30 million years time.

0.04 km

(ii) Apart from erosion, name another factor which may affect the rate of height reduction over a long period of time

Isostasy/plate movements/sea level rising/magma activity

(iii) Calculate the percentage change in the height of the mountain between 60 and 30 million years ago.

Space for calculation:

Change = 2.5 - 0.63 = 1.87 % change = 1.87/2.5 x 100 = 74.8 % 74.8%

(iv) Express as a simple whole number ratio the height of the mountain at 75, 60 and 45 million years ago.

Space for calculation:

5.00 : 2.50 : 1.25

75 million 4 : 60 million 2 : 45 million 1

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Marks

1

1

1

Marks The diagram below shows minerals found in shale as it undergoes regional metamorphism. Grade of metamorphism Unaltered shale Medium High Low Ē ----clay chlorite biotite garnet • sillimanite feldspar quartz Which mineral appears after the first low grade metamorphic mineral has disappeared? Garnet 1 Explain why quartz cannot be used to define a metamorphic grade. It appears in unaltered shale as well as all grades of metamorphosed shale/because it is not changed by heat or pressure 1

11.

minerals present

(a)

(b)

12. Five types of plate boundary, labelled A, B, C, D and E, are shown on the world map below.

Complete the table below which is continued onto the next page

Drawing of Plate Boundary	Type of Plate Boundary	Location on world map
	Constructive	D
	Conservative	E

All 9 correct = 5 marks 7/8 = 4 marks 5/6 = 3 marks 3/4 = 2 marks 2 correct = 1 mark

[END OF MARKING INSTRUCTIONS]