



Sample “SAT” Questions:
Suggested answers



Qu. 4.1. (level 4)

- | | |
|---------------------|--------|
| (a) D | 1 mark |
| (b) (i) solid | 1 mark |
| (ii) liquid | 1 mark |
| (c) (i) sedimentary | 1 mark |
| (ii) igneous | 1 mark |

(Note: actually there *are* rare fossils in some volcanic rocks – the casts of bodies in pyroclastic flow deposits at Pompeii are good examples)

Maximum 5 marks

Qu. 4.2. (level 4)

(a) **ONLY** tick one box in each row

example	weathering	erosion	neither
The stones in an old stone wall have been pushed apart by the roots of weeds.	√		
An old granite gravestone is still smooth and shiny.			√
A clay flower pot in the garden has crumbled and broken into pieces over winter.	√		
Some soil has been washed from a flower bed by the rain.		√	

4 marks

(b) freezing **or** freeze-thaw **or** acid rain **or** chemical weathering 1 mark

Maximum 5 marks

Qu. 5.1. (level 5)

- (a) (i) any one from
- plants **or** animals buried for thousands **or** millions of years
 - remains **or** impressions of plants **or** animals found in rock
 - remains **or** traces (footprints, burrows etc) of living things found in rock
- 1 mark
- (ii) sedimentary 1 mark

contd. on next page

- (b) (i) any one from
- cooling **or** crystallisation from magma **or** lava **or** molten rock
 - form from magma **or** lava **or** volcanoes
- 1 mark
- (ii) any one from
- formed in conditions where plants **or** animals **or** living things could not exist
 - magma is too hot for plants **or** animals to survive
- 1 mark
- (Note: see footnote to Qu 4.1 above – credit answer if explained)
- (iii) any one from
- larger or bigger in granite
 - smaller in basalt
- 1 mark

Maximum 5 marks

Qu. 5.2. (level 5)

- (a) any **two** from
- discoloured **or** stone gets dirty **or** things grow on it **or** it gets mouldy
 - loss of detail **or** material worn away **or** it gets rounded **or** smoother
 - bits broken off **or** cracks (accept named feature altered e.g. nose, eyes are eroded **or** get smaller **or** are crumbled)
- 2 marks
- (b) water freezes on it 1 mark
 plants grow on it Do **not** tick more than two boxes 1 mark
- (c) any one from
- acid
 - sulphur dioxide / SO₂
 - carbon dioxide / CO₂
- 1 mark

Maximum 5 marks

Qu. 5.3. (level 5)

(a)

Process	Letter
<i>Melting</i>	E
<i>Deposition</i>	C
<i>Transport</i>	B
<i>Weathering</i>	A
<i>Burial</i>	D

4 correct = 3 marks
 2 correct = 2 marks
 1 correct = 1 mark

(3 correct only possible if a letter is repeated = 2 marks)

- (b) Metamorphic rocks 1 mark
- (c) (i) (Heat) from within the Earth/Earth's core 1 mark
 (ii) (Heat) from the Sun/Solar energy 1 mark

Maximum 6 marks

Part (c) can be used as a stimulus for discussion:

e.g. Why is Earth's interior hot? Why is energy needed to cause rain?

Discussion points – Qu. 5.3

Earth's core is *very* hot – around the same temperature as the Sun's surface (6000°C)! This is *not* "left-over" heat from Earth's formation, but is mostly heat released as a result of the radioactive decay of heavy, unstable elements like Uranium, and by the slow crystallisation of the Earth's liquid outer core to form the (slowly growing) solid inner core.

Solar energy is needed to evaporate the water that later condenses to form clouds and rain; also to generate the winds (convection) that bring the clouds to land. The amounts of energy involved are huge – think of a single hurricane and the energy stored within it!

Qu. 6.1. (level 6)

(a)

Rock	Classification
A	Igneous
B	Sedimentary
C	
D	Sedimentary
E	Metamorphic

4 marks

- (b) (i) E
(ii) D
(iii) A

1 mark
1 mark
1 mark

Maximum 7 marks

Qu. 6.2 (level 6)

(a) (i)

- high **or** large pressure (do **not** accept 'pressure')
or large forces 1 mark
- high temperature **or** heat (do **not** accept 'temperature') 1 mark

(ii) marble 1 mark

- (b) • heating **or** melting 1 mark
- cooling **or** solidifying **or** crystallising **or** rising **or** moving to a cooler place 1 mark

- (c) 1 weathering
2 transport
3 deposition
4 burial

*All **four** answers needed in correct order* 1 mark

Maximum 6 marks

Qu. 6.3 (level 6)

(a)

Rock group	Photograph (X, Y or Z)	Texture
Igneous	Y	Crystalline Randomly arranged crystals
Metamorphic	X	Crystalline Aligned crystals
Sedimentary	Z	Fragmental Fossils present

(1 mark per column correct)

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- (b) (i) 12 mm \pm 2mm (1 mark)
(ii) Slow (1 mark)
- (c) granite (1 mark)

Maximum 6 marks

Qu. 7.1. (level 7)

(a) **BOTH** type of rock **AND** evidence for its formation are needed for each mark

igneous, because igneous rock comes from volcanoes or igneous
because there are volcanoes. 1 mark

metamorphic – either of the following

- because volcanoes show there were high temperatures **or** molten rock / magma was present
- because mountains show that the rocks have been under high pressure **or** because mountains show there has been movement of rock/crust/land. 1 mark

sedimentary, because there are river valleys and rivers produce sediment **or** sedimentary, because there are river valleys **or** sedimentary, because rivers produce sediment. 1 mark

(b) it will break them up **or** split them **or** weather them **or** cause onion-skin weathering 1 mark
because the rocks/minerals will expand and contract 1 mark

Note: Freeze-thaw weathering is not acceptable. Liquid water does not currently exist on Mars, as the temperature is never high enough for long enough to melt ice

Maximum 5 marks

Qu. 7.2 (level 7)

- (i) C **or** E 1 mark
- (ii) B **or** F 1 mark
- (iii) A and then D (accept D then A for 1 mark) 2 marks
- (iv) Contact metamorphism **or** heat from rock C has metamorphosed/changed/altered rock B **or** rock B was altered/changed/metamorphosed by (heat from) magma (that formed rock C). 1 mark

Maximum 6 marks

Qu. 7.3 (level 7)

- (a) **Either** presence of fossils **or** laid down in layers (beds or strata) 1 mark
- (b) **Either** cuts through rocks A and C **or** has altered/metamorphosed the rock next to it. 1 mark
- (c) Underline only **crystalline** and **foliated**. 2 marks
- (d) **Either** lies on top of rock C (principle of superposition) **Or** has pebbles of C within it (law of included fragments) (1 mark)
- (e) Cuts through both A and C (law of cross-cutting relationships) (1 mark)

Maximum 6 marks

Answers to (d) and (e) can be used as a basis for further discussion of the principles given in brackets, which are used both in the sequencing (relative dating) of rocks and in the relative dating of archaeological deposits & artefacts found during digs.