



GCSE MARKING SCHEME

GEOLOGY

SUMMER 2014

INTRODUCTION

The marking schemes which follow were those used by WJEC for the SUMMER 2014 examination in GCSE GEOLOGY. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were 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 conferences was to ensure that the marking schemes were 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' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

GCSE GEOLOGY
SUMMER 2014 MARK SCHEME

GCSE Geology – On-screen Examination

| Section | Question | Answer | Mark | Total |
|----------------|-----------------|---|-------------|--------------|
| 1 | 1 | angular unconformity | 1 | |
| | 2 | deposition of rock C (2) (1 mark for two correct) erosion of rock D uplift and tilting deposition of rock D | 2 | |
| | 3 | poorly sorted; angular fragments; coarse grained clasts | 3 | |
| | 4 | breccia | 1 | |
| | 5 | angular, no time for attrition or abrasion (2) poorly sorted not travelled far enough to be sorted / quickly dumped (2) | 2 | |
| | 6 | description of freeze thaw (1) water gets into cracks (1) water freezes (1) ice expands (1) widens cracks (1) repeated (1) | 3 | 12 |
| 2 | 7 | the texture suggests two stages of cooling the rock is gabbro | 2 | |
| | 8 | older than 450 million years | 1 | |
| | 9 | half-life of the parent isotope ratio of the parent isotope to the daughter isotope | 2 | |
| | 10 | between 1 and 2 | 1 | |
| | 11 | parallel to strike of sediments / concordant shape sheet-like body / not rounded folded smaller metamorphic aureole | 2 | |
| | 12 | the shale accumulated in a low energy environment graptolites are useful fossils for correlating rocks the large graptolite in Figure 5 has thecae on one side of the stipe and they point inwards | 3 | |
| | 13 | 4 oldest 1 3 2 only two correct (1) | 2 | |
| | 14 | igneous rock resistant – headland (2) soft shales – bay (2) hill of resistant igneous rock (2) sandstone / conglomerate resistant – headland (2) beach deposition in bay between headlands (2) two landforms explained | 4 | 17 |

| Section | Question | Answer | Mark | Total |
|---------|----------|---|------|-----------|
| 3 | 1 | ocean ridge shallow focus earthquakes only | 2 | |
| | 2 | divergent (constructive) | 1 | |
| | 3 | deep and shallow focus earthquakes coastal mountain chain | 2 | |
| | 4 | convergent (destructive) oceanic-continental | 1 | |
| | 5 | dipping under the continent / shallow on ocean side getting deeper under continent (east) / benioff zone (1) subduction (1) of ocean plate under continental plate / to the east (1) one description, one explanation and one other | 3 | |
| | 6 | area of reversely magnetised ocean crust E ridge crest F wide area where there is no magnetic anomaly G oldest portion of oceanic crust in this area H | 4 | |
| | 7 | thermal convection in the mantle weak partially molten asthenosphere | 2 | |
| | 8 | they are a dense mass of water and ash that flow down slopes at high speed | 1 | |
| | 9 | flow of lava into the ocean | 1 | |
| | 10 | increase in gas (CO ₂) increase in seismicity / seismic gap historical records of lahars early warning systems / volcanic hazards map ground deformation (tiltmeters) statement plus some detail e.g. method of measuring for 2 x 2 | 4 | 21 |
| 4 | 11 | fold limbs dip at different angles the strike of the folds is E-W | 2 | |
| | 12 | the fold is an anticline the fault is a dip-slip fault (normal / reverse / thrust) the angle of dip on the northern limb of the fold is more than 30° | 3 | |
| | 13 | anticline | 1 | |
| | 14 | seepage of oil at the surface | 1 | |
| | 15 | oil in the drilling mud | 1 | |
| | 16 | geological mapping | 1 | |
| | 17 | porous reservoir rocks for natural storage (1) impermeable cap rock to prevent leakage (1) trap prevents migration (1) | 3 | 12 |

| Section | Question | Answer | Mark | Total |
|---------|----------|--|------|-----------|
| 5 | 1 | 2 | 1 | |
| | 2 | galena | 1 | |
| | 3 | crystallisation from hydrothermal fluids | 1 | |
| | 4 | iron ore in mineral vein 1 (1) above average conc ⁿ of magnetic minerals in vein 1 (1) no iron ore in the other two veins (1) | 2 | |
| | 5 | one problem stated and described e.g. contaminated land, spoil tips, large pits, shafts etc. description could include remedies (2) | 2 | 7 |
| 6 | 6 | R plant S trilobite T reef-building coral | 3 | |
| | 7 | R not mobile and lived on land S crawled around on the sea bed T lived as a colony fixed to the sea bed | 3 | |
| | 8 | shallow marine shelf | 1 | |
| | 9 | coral and trilobite are marine (1) plant lived on land nearby washed in to the shallow sea (1) | 2 | |
| | 10 | rounded (1) good to moderate sorting (1) | 2 | |
| | 11 | cross bedding | 1 | |
| | 12 | ← | 1 | |
| | 13 | evaporation of water (1) drying out of shale (1) shrinkage of shale (1) desiccation cracks (1) | 2 | |
| | 14 | desert and shallow lake | 1 | |
| | 15 | 30°– 40° | 1 | |
| | 16 | UK near the equator during Upper Palaeozoic (1) covered by sea which evaporated (1) hot climate (1) | 2 | 19 |

| Section | Question | Answer | Mark | Total |
|--------------------|----------|---|------|------------|
| 7 | 1 | approximately 70% | 1 | |
| | 2 | it would take 7 volcanic eruptions of Mount Pinatubo to equal one year of human production | 1 | |
| | 3 | metamorphism of limestone | 1 | |
| | 4 | 1700-1850 little change (1) 1800-2000 continuous / exponential increase (1) reference to figures from diagram (1) | 2 | |
| | 5 | support because 1860 onwards there is a continuous increase in temperature matching increase in CO ₂ (1) do not support because some periods of decrease in temperature / oscillations in the graph (1) | 2 | |
| | 6 | decreased albedo | 1 | |
| | 7 | an increase in volcanic activity | 1 | |
| | 8 | atmospheric gases such as CO ₂ absorb heat escaping from the Earth reflect heat back to Earth / trap heat causes global warming / increases temperature of atmosphere extra temperature increase caused by increase in CO ₂ by humans is 'enhanced' effect | 3 | 12 |
| Paper Total | | | | 100 |



WJEC
245 Western Avenue
Cardiff CF5 2YX
Tel No 029 2026 5000
Fax 029 2057 5994
E-mail: exams@wjec.co.uk
website: www.wjec.co.uk