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GCE

Edexcel GCE

Geography A (6461)

Summer 2006

Mark Scheme (Results)

1

a **Study Figure 1 which shows the main characteristics of three different types of volcano.**

i **Name volcano type A.** **(1)**
Composite

ii **Where would volcano type B be found?** **(1)**
Constructive or hot spot or accept location. Such as Hawaii, Icleand or named volcano (such as Mauna Loa, Hekla).

iii **Contrast the shapes of volcano types B and C.** **(3)**
B has wide base; C is narrower. B has low height; C is higher. B has gently sloping sides; C has steeply sloping sides. C has larger crater. Point mark.
Differences must be explicit for max.

iv **Explain the differences identified in (a) (iii).** **(3)**
Acid lava with relatively low temp and high viscosity. It flows a short distance before cooling and solidifying, hence short, steeply sloping sides and high height. Typical of destructive margins.
Whereas basic lava with high temp and low viscosity. It flows long distances before cooling and solidifying, hence gently sloping sides and low height. Typical of constructive margins.

3	Effectively links lava type to shape of volcanoes
2-1	Recognises characteristic(s) of lava types or plate margin types.

b **i** **Briefly explain why tectonic plates move.** **(2)**
Convection currents in the asthenosphere (1) generated by radio-active decay in the core. Crustal plates "float" in the asthenosphere and are dragged or pushed by the convection currents. Reserve second mark for either development of movement mechanism or detail of causes of convection.

ii **Explain how ONE piece of evidence supports the view that tectonic plates move.** **(4)**
Possible evidence includes:
- palaeomagnetism
- age of sea-floor basalts
- fossils
- geological evidence
- climatalogical evidence
- jig – saw fit of continents

4-3	Evidence used to support the theory
2-1	Aware of the nature of the evidence

c **With reference to a located example, describe and account for the landforms found at a destructive plate margin.** **(6)**

Located example likely to be Nazca/S.American or Juan de Fuca/N.American.
Landforms include fold mountains, acid/composite volcanoes, ocean trench….
Explanations should be based on convergence, subduction, folding, rising magma…
Diagram does not have to be used. Do not double credit text and diagram.

6-5	Clear description and accurate explanation with convincing locational detail.
4-3	Clear description and some simple explanation with location stated, but not used.
2-1	Basic description without any valid explanation

2

a **Study Figure 2 which is a photograph of a piece of weathered basalt.**

i **Define the term weathering**. **(2)**

Breakdown and decay of rocks (1) "in situ" or by the elements of the weather, or by physical and chemical processes (1)
NB. Weak answers may mis-use term 'wearing away' but credit other elements.

ii **Describe the shape of the fragments of weathered basalt**. **(2)**

Jagged/angular, sharp corners and / or edges (1)
Layers / sheets / smooth or flat face (1)

iii **Describe and explain how ONE physical process is likely to have weathered this basalt.** **(4)**

Freeze-thaw, insolation or possibly pressure release (1) Process detail e.g. as water enters cracks/joints, freezes, expands, exerts stress and breaks off fragments. (3)

b **With reference to a located example, describe and explain the impact of chemical weathering on limestone landscapes.** **(6)**

Located example likely to be Yorkshire Dales or The Burren
Chemical weathering by carbonation/solution.
Landforms include limestone pavement (clints and grykes) and shake holes.
Diagram does not have to be used. Do not double credit text and diagram.

6-5	Clear description and accurate explanation with convincing locational detail.
4-3	Clear description and some simple explanation with location stated, but not used.
2-1	Basic description without any valid explanation

c **Explain how the impact of weathering on human activity may be:**

1. Positive **(3)**

Weathered landscapes produce distinctive landforms such as tors, limestone pavements that attract tourists who create a demand for tertiary industry and increase spending in the local economy. Some weathered products e.g. kaolin from the hydrolysis of granite, have an economic value. Weathering contributes to soil formation for agriculture.

2. Negative **(3)**

Public buildings, such as St.Paul's Cathedral, have been damaged by weathering necessitating expensive repairs and restoration. Falling scree can create a travel hazard on motorways, such as the M5 south of Bristol where fencing and netting has had to be installed.

In each case:

3	Valid activities outlined with impact explicitly explained.
2-1	Valid human activities stated and impact implied.

3

a **Study Figure 3 which shows the stores of water in the global hydrological cycle.**

i **Identify Store X.** **(1)**
Ocean(s) / sea(s)

ii **Define the term groundwater store.** **(2)**
Water stored underground (1) in pore spaces, cracks/joints in soil, below water table(1)

iii **Suggest two ways in which water can be stored on the land surface.** **(2)**
Lakes, rivers, reservoirs, ponds, puddles, vegetation, soil, glaciers.
Any 2x1

iv **Briefly explain how water is transferred from the land surface store to the atmosphere store.** **(3)**
Evaporation or transpiration or evapotranspiration (1) as water is converted from liquid to vapour (1) by the addition of heat (1).

b **Explain:**

i **how orographic processes lead to the formation of cloud** **(3)**
Air forced to rise over a relief barrier (1), air cools as it rises (1), reaches dew point/becomes saturated/condensation occurs (1)

ii **how raindrops are formed.** **(3)**
Either collision/coalescence = water droplets collide and increase in size until they are heavy enough to fall through the rising air beneath or ice crystal mechanism (Bergeron-Findeison) vapour condenses around ice crystals at high altitude/low temperature. They increase in size, fall and thaw in warmer temperatures at lower elevations.

Answer may refer to one process in depth, or both processes more briefly. For max marks the link to falling must be explicit.

c **With reference to a named flood event, describe and explain the causes of river flooding.** **(6)**
Specific event likely to include Mississippi 1993, Boscastle 2004, West Midlands 2000.
Causes are likely to be physical: intense precipitation, impermeable rocks, saturated soils, step relief etc – and human: altering channel form, urbanisation, deforestation etc.
Explanation is likely to centre on how the cause led to too much water being in the channel e.g. by increasing rate/amount of surface run-off.
Diagram does not have to be used. Do not double credit text and diagram.

6-5	Clear description and accurate explanation with convincing locational detail.
4-3	Clear description and some simple explanation with location stated, but not used.
2-1	Basic description without any valid explanation

4

a **Study Figure 4 which shows rainfall and discharge data for the River Otter, Devon.**

i **State the equation used to calculate discharge.** **(2)**
Cross sectional area (CSA) (or width x depth) x (mean) velocity (V)

ii **Describe the pattern of discharge shown.** **(3)**
Overall, double peak (1), steep rising limbs (1) less steep recession/falling limbs (1), high peaks (1) use of data (1). Any 3 x 1.

iii **Suggest how the pattern of discharge may have been influence by:**
1. relief **(2)**
steep relief encourages surface run-off and doesn't allow time for infiltration. Water reaches channel quickly giving a steep rising limb.

2. precipitation **(2)**
double input leading to two peaks. Intense rate therefore steep rising limb.

In each case, one for explaining the factor and one for linking it to the pattern.

b **i** **Name and outline two processes by which rivers transport their load.** **(2)**
Suspension, saltation, traction, solution, flotation. Any 2 x1. Must have name and outline for each mark. 1 mark for just two names.

ii **Describe and explain how the shape and size of load particles typically change with distance downstream.** **(3)**
smaller (1) more rounded (1) due to attrition (1)

c **Describe the appearance, and explain the formation, of braided channels.** **(6)**
Description = main channel subdivided into a series of smaller channel which may rejoin later. Small islands of sediment in the middle of the channel.
Explanation = fluctuating discharge, high sediment load, possibly glacial meltwater or periglacial. Also semi-arid. Deposition occurs in channel as discharge decreases and river loses competence and capacity.

6-5	Clear description and accurate explanation with detail of causes of deposition.
4-3	Clear description and some simple explanation relating to deposition
2-1	Basic description without any valid explanation

5

a **Study Figure 5 which shows selected changes in ground cover on an area of sand dunes.**

i **Define the term psammosere.** **(2)**

(i) Plant succession, (or description) (1) in a sand dune (environment / ecosystem) (1).

ii **Describe the pattern of change in '% bare sand'.** **(3)**

Overall decrease (1), variable rate of change (1), use of data as evidence (1)

iii **Suggest how species, such as sea buckthorn, are able to survive in the challenging conditions of a sand dune environment.** **(3)**

Low – to reduce wind impact
Small leaves/leaves curl inwards – to reduce surface area and cut down evapotranspiration
Long roots – for stability in loose sand and to find water.
Salt secreting glands to utilise sea water.

3	At least 2 adaptations explained in relation to the environmental conditions
2-1	Adaptation(s) identified or one explained.

b **i** **Name and outline two processes of marine erosion.** **(2)**

Pounding, hydraulic action, corrasion/abrasion, solution/corrosion, attrition….
Any 2 x 1. Must have name and outline for each mark. 1 mark for just two names.

ii **Explain how rates of marine erosion may be decreased by human activity.** **(4)**

Human activities include sea walls, groynes, beach nourishment etc etc

4-3	Clear link to impact on erosion rate.
2-1	Valid human activities identified.

c **Describe the formation, and likely modification, of a coastal arch.** **(6)**

Formation = Wave refraction around a headland leads to a concentration of wave energy on the sides. Weakness exploited to initially form cave(s) which eventually, with further erosion, cuts through the headland to form an arch.
Modification = Further erosion, especially at high tides, and weathering of the arch roof lead to collapse and the formation of a stack. May develop into stump.
Process detail should be credited.
Diagram does not have to be used. Do not double credit text and diagram.

6-5	Clear description with subsequent modification explicit.
4-3	Clear description of arch formation.
2-1	Basic description.

6

a **Study Figure 6 which shows pebble size data for two sites in Porlock Bay, Somerset.**

i **Describe the distribution of pebble sizes at Gore Point.** **(3)**
Uneven (1) more smaller sizes (1) use of data (1)

ii **Which of the two sites has the greater range of pebble size?** **(1)**
Gore (Point)

iii **State two ways, other than size, in which the pebbles at the two sites may differ.** **(2)**
Shape, amount, rock type, smoothness / roughness, density, orientation, colours, mineral composition. Any 2 x 1 valid ideas.

iv **Suggest why there are no pebbles longer than 14.9 cm at Hurlstone Point.** **(4)**
Cliff not being eroded so no new fragments added. Existing beach pebbles have been reduced in size by attrition. Low wave energy unable to carry larger pebbles on-shore. Weak swash…ditto. Small particles moved by longshore drift. Different rock types. Accept human removal.

4-3	Two developed ideas
2-1	Two basic statements of one developed idea

b **Describe and explain the process of longshore drift.** **(4)**
The movement of beach material along a beach
Wind and waves approach at an angle causing swash at an angle which carries particles diagonally across the beach. Backwash is perpendicular due to gravity giving a net longshore movement.

4-3	Description and explanation of process
2-1	Description of process

c **Describe the appearance, and explain the formation, of off-shore bars.** **(6)**
Appearance = long, narrow ridges of sediment parallel to the coast but separated from it by an area of open water.
Formation = waves break off-shore due to gentle gradient and shallow water. Waves lose energy after breaking and deposit sediment. This reduced the water depth further encouraging other waves to break at the same point and increase the size of the bar.
Diagram does not have to be used. Do not double credit text and diagram.

6-5	Clear description and accurate explanation with detail of causes of deposition.
4-3	Clear description and some simple explanation relating to deposition
2-1	Basic description without any valid explanation