Section A

Answer **one** question from Section A and **one** question from Section B and **one** other question from **either** Section A **or** Section B.

Use case studies to support your answers where appropriate.

Total for this question: 25 marks

1 The Restless Earth

1 (a) Describe the characteristics of oceanic crust.

[3 marks]

Oceanic crust is young (less than 200 million years olds). It is dense so sinks below continental crust. It is much thinner than continental crust.

1 (b) Study **Figure 1** on the insert, a map showing the world distribution of volcanoes.

Describe the world distribution of volcanoes.

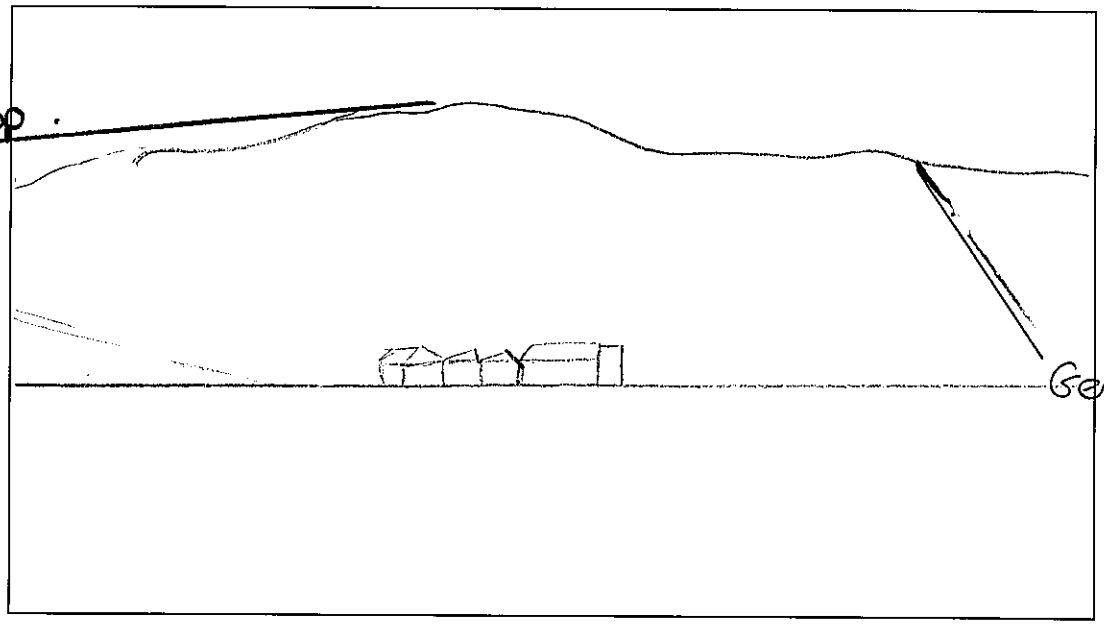
[3 marks]

Volcanoes occur along plate margins e.g. There is a line of them down the middle of the Atlantic Ocean following the plate margin. There is a line of volcanoes along the west coast of S. America where there is a destructive boundary. Some volcanoes occur away from margins. ~~As~~ You can see this with Hawaii.

1 (c) Study **Figure 2** on the insert, a photograph of Eyjafjallajökull, a volcano in Iceland.

1 (c) (i) Draw a labelled sketch cross section to show the characteristics of this volcano.

[3 marks]



Question 1 continues on the next page

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1 (c) (ii) Use a case study to discuss the immediate and long-term responses to a volcanic eruption.

[8 marks]

Mt. St. Helens erupted in May 1980. The immediate response when the USGS identified there was a risk of an eruption was to set up a 'red zone' within 10 miles of the volcano. People were evacuated from this area & prevented from entering without permission in order to keep the area safe. Immediately after the eruption search & rescue teams went into the area to try to find survivors & bodies. In the following weeks Washington communities spent millions of $ removing over 1 million m^3 of ash from streets & roofs to prevent collapse & to keep roads open. ~~The~~ A long term response was to create a new outlet to Spirit Lake. It was designed to prevent the lake overflowing if due to an eruption it got filled with debris. The outflow was finished in 1985 and has prevented catastrophic flooding.

Extra space

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1 (d) Study **Figure 3** on the insert, a map showing the Yellowstone supervolcano in the USA.

1 (d) (i) Use information in **Figure 3** to complete the table below.

[2 marks]

Distance along line A–B	60 ..... km
Shape of the supervolcano (caldera)	rounded - although not a perfect oval.

1 (d) (ii) How is a supervolcano different from a volcano?

[2 marks]

A supervolcano has much bigger eruptions (1000 km^3 of material compared to 1 km^3). They erupt less frequently are sunken in the middle (called a caldera) rather than mountain shaped.

1 (d) (iii) Describe the likely global consequences of a supervolcano eruption.

[4 marks]

A large amount of ash would enter the atmosphere - travelling around the world in a week. This will reduce the amount of sunlight and therefore there will be a global temperature drop. This will lead to crop failure which could cause starvation. The ash will also stop air travel making it difficult for remaining food supplies to be sent to where they are needed. This could cause social unrest & many millions of deaths

Extra space

25

Section B

Answer **one** question from Section A and **one** question from Section B and **one** other question from **either** Section A **or** Section B.

Use case studies to support your answers where appropriate.

Total for this question: 25 marks

5 Water on the Land

5 (a) Study **Figure 13** on the insert, a 1:25 000 Ordnance Survey map extract of part of the Peak District.

Damflask Reservoir is named in grid square 2790. The dam is in grid square 2890.

5 (a) (i) What is the length of the dam along the line **X–Y** on the map?

[1 mark]

0.25 ..... km

5 (a) (ii) What shape is Damflask Reservoir?

[1 mark]

It is wedge shaped. wider in the SE then gets narrower to the NW.

5 (a) (iii) Describe the relief (height and slope of the land) around Damflask Reservoir.

[2 marks]

The land is 170m at the lake level, rising to 300m. The steep slopes are found near Fars Hill whereas it is less steep at Dungworth

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5 (b) Study **Figures 14a** and **14b** on the insert, maps showing rainfall (2012) and population density (2011) in England and Wales.

Explain how **Figures 14a** and **14b** show that there are likely to be areas of water surplus and areas of water deficit in England and Wales.

[6 marks]

There is less rain as you go west to East with 1500mm in Wales compared to less than 1000 in the south-East This is in direct contrast to population with wales having a low population density of 0.99 per km^2 suggesting there will be a water surplus with more water than the population yes. Yet london has densities of above 1000 per km^2 yet much less rainfall suggesting a deficit where there is less water than the population

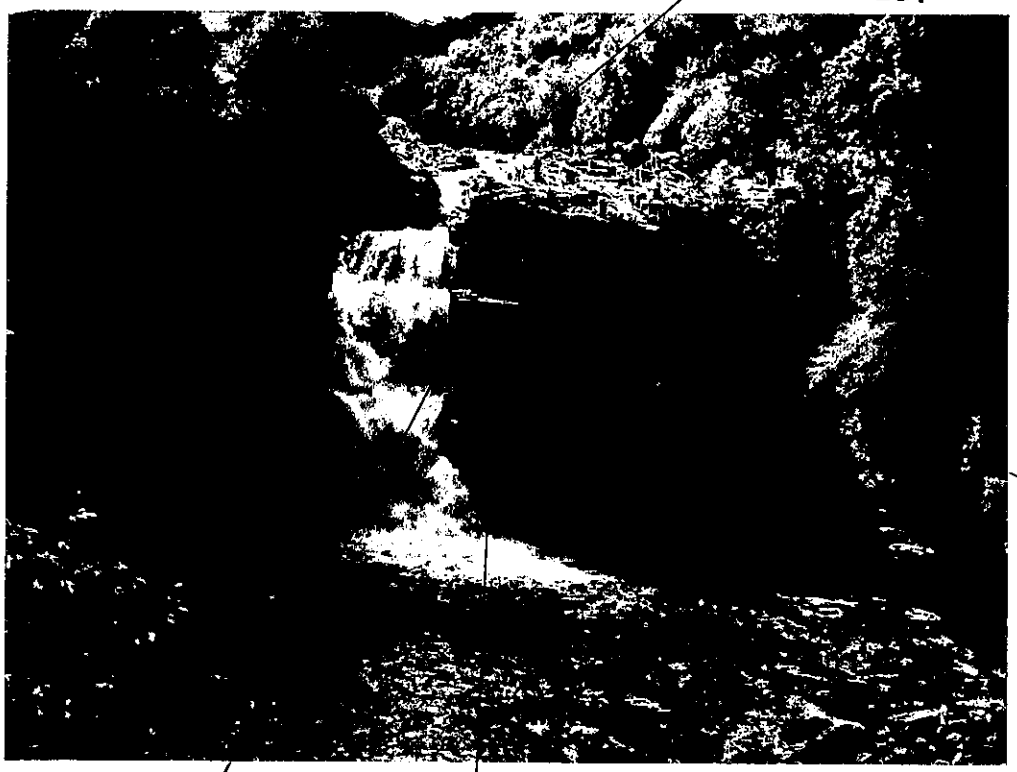
Extra space ... requires.

Question 5 continues on the next page

5 (c) Study **Figure 15** on the insert, a photograph of High Force waterfall on the River Tees in the north of England.

Figure 16 is a black and white copy of **Figure 15**.

Figure 16



5 (c) (i) On **Figure 16**, mark with an arrow and label **three** characteristics of the waterfall.

[3 marks]

5 (c) (ii) Explain the formation of a waterfall.

[4 marks]

There are two horizontal rock layers of different resistances. The soft rock is eroded faster by abrasion & hydraulic action creating an overhang. Over time the overhang is eroded further by continued abrasion & hydraulic action. Eventually the overhang weakens & collapses allowing the waterfall to move backwards creating a gorge. The process then repeats.

Extra space

Question 5 continues on the next page

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5 (d) Describe how river processes of transportation and deposition change downstream.

[8 marks]

In the upper course the main transportation processes are traction & saltation due to the limited energy in the river. Traction is where large boulders are rolled along the bed & saltation is where small pebbles are bounced along. As you move down stream this changes as the material is smaller & the river more powerful allowing suspension - where smaller particles are carried by the river.
In the upper course large material is deposited after floods & is deposited equally across the channel. As you move downstream smaller sands, silts & clays are deposited & mainly on the inside heads of meanders where the water is slower so there is less energy.

Extra space

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Total for this question: 25 marks

6 Ice on the Land

6 (a) Study **Figures 17a** and **17b** on the insert, graphs showing information about the Solheimajökull glacier in Iceland in the years 1931–2012.

Figure 17a shows the advance and retreat of the glacier.
Figure 17b shows the change in the position of the snout of the glacier.

Describe the trends shown in **Figures 17a** and **17b**.

[4 marks]

Figure 17a shows that the distance the glacier is from it's 1931 varies. Until the 1960s the glacier was retreating but in the 70s & 80s it advanced by about 50m. The figure 17a, 17b shows the glacier was longest in 1931, retreated until the late 60s then began to advance again but was still 50m shorter than in 1931. Recently the retreat has been rapid and it is now 1300m shorter than in 1931

Extra space

Question 6 continues on the next page

6 (b) Study **Figure 18** on the insert, a 1:50 000 Ordnance Survey map extract of the Helvellyn area of the Lake District.

6 (b) (i) Red Tarn (grid square 3415) is in a corrie.

In what direction does the corrie face?

[1 mark]

NE

6 (b) (ii) What is the height of Helvellyn at grid reference 342151?

[1 mark]

949 m

6 (b) (iii) A corrie is labelled on **Figure 18.**

Figure 19 (opposite) is a black and white copy of **Figure 18.**

On **Figure 19**, mark with an arrow and label **two other** landforms resulting from glacial erosion.

[2 marks]

Do not write outside the box

Figure 19

Question 6 continues on the next page

Do not write outside the box

6 (c) 'Distinctive landforms result from different glacial processes.' Illustrate this statement with reference to **one** landform of erosion and **one** landform of deposition.

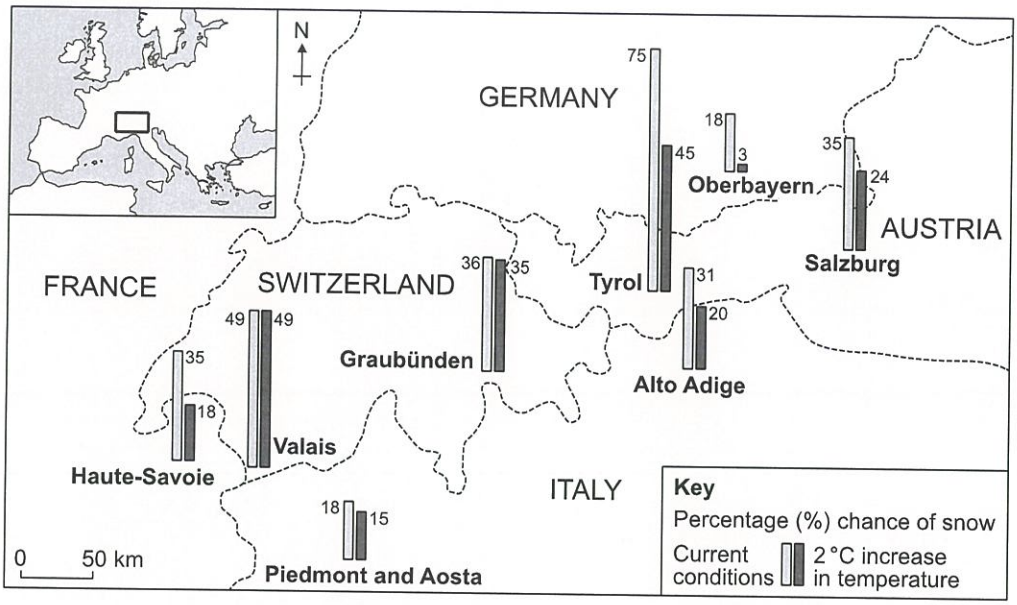
[8 marks]

Corries are circular, arm-chair shaped hollows occuring near the start of a glacier. Terminal morraine is material dropped by the glacier when it retreats. Thus there is a difference in where these landforms are found. Corries occur in upland areas where a glacier starts & terminal morraine is found in lowland areas where the glacier ended. They are formed by different processes. Corries are formed by plucking & abrasion making a hollow steeper & deeper. Whilst the material from the morraine may have been kneed by erosional processes - a morraine is a depositional landform where material is dropped by melting ice.

Extra space They also ~~occur~~ are different in terms of shape - a corrie is a solid piece of rock which has been eroded into a deep hollow whereas morraine accursas like of broken rock due to the processes that formed it.

6 (d) Study **Figure 20**, a located bars map showing the chance of snow in selected regions of the Alps under current conditions and the chance of snow if there is a 2 °C increase in temperature.

Figure 20



6 (d) (i) Describe how the percentage chance of snow may change if there is a 2 °C increase in temperature.

[3 marks]

Most areas, particularly to the east will have less snowfall e.g. Tyrol with a 30°C reduction. Some areas have little change e.g. Switzerland with a 1% decrease. Some areas like Haute-Savoie & Tyrol have a reduction of ~~almost~~ more than half.

Question 6 continues on the next page

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6 (d) (ii) Describe the economic and social impacts of unreliable snowfall on some resorts.

[6 marks]

Unreliable snowfall → a shorter season will have big impacts on resorts - particularly those lower down like Leysin. This could lead to less tourists as skiers choose resorts that are more reliable (e.g. higher up) This could cause people to feel less secure in their jobs or even lose their jobs - esp those who ~~reduce particular~~ rely on tourist e.g. hotel operators, ski hire shops. This will reduce spending in the economy & banks will be less likely to invest so there will be fewer opportunities to start new ventures.

Extra space

A social impact may be with fewer tourists facilities like bus routes, shops, entertainment may be closed or reduced leading to a reduced quality of life.

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