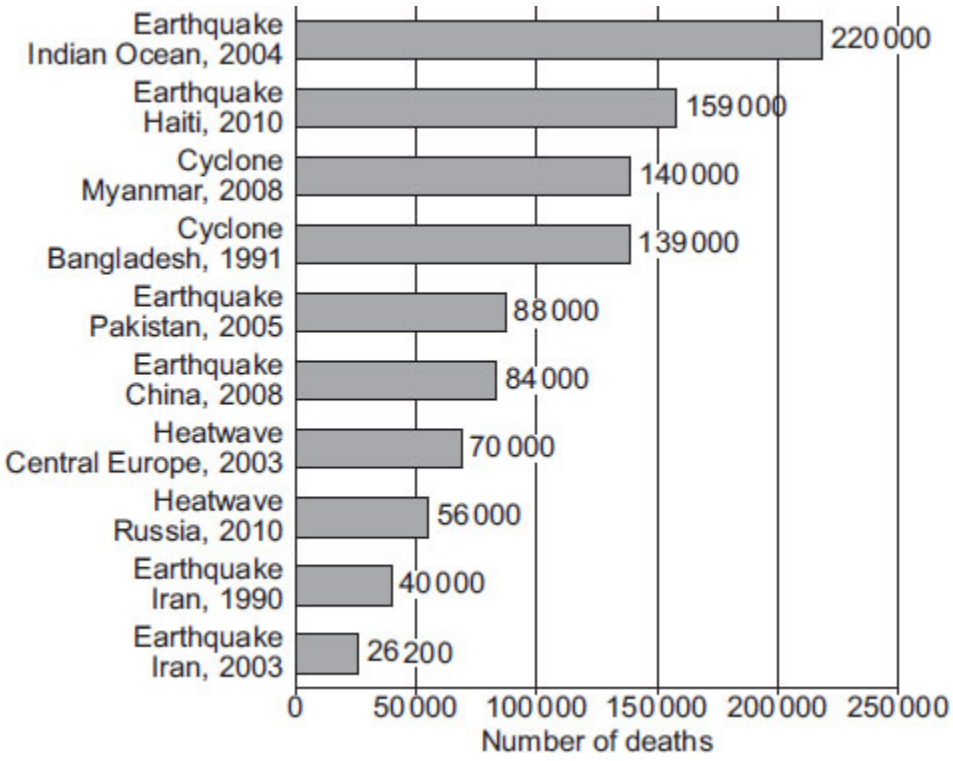
1. **The challenge of natural hazards**

Study the graph below showing the deadliest natural disasters between 1990 and 2018.



(a) Using the graph above, which natural disaster caused the greatest number of deaths?

(1)

(b) Using the graph above, which **one** of the following statements is true?

Shade **one** circle only.

A The two earthquakes in Iran caused 92 000 deaths. ⬭

B The cyclone in Bangladesh killed more people than the cyclone in Myanmar. ⬭

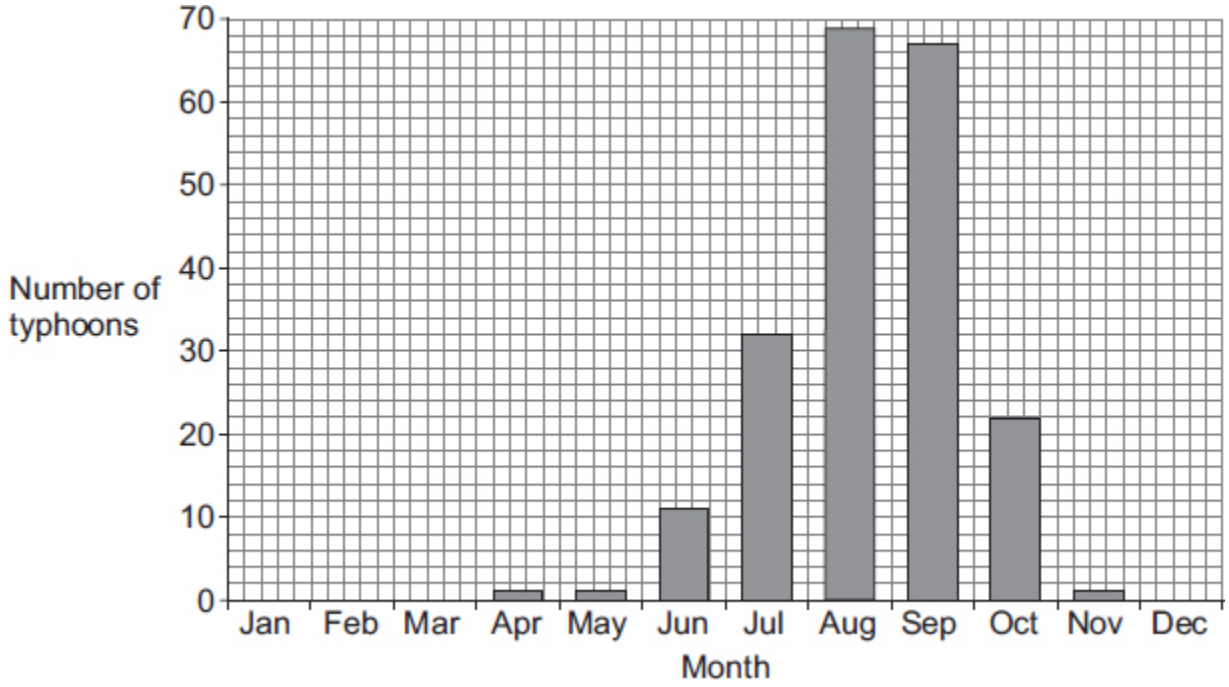
C The two heatwaves in Central Europe and Russia resulted in 126 000 deaths. ⬭

D The earthquake in China killed more people than the earthquake in Pakistan. ⬭

(1)

(Total 2 marks)

2. Study the graph below showing the number of tropical storms (typhoons) that reached Japan in each month from 1851 to 2018.



The total number of typhoons reaching Japan was 204.

What percentage of the total number of typhoons occurred in August?

Give your answer to the nearest **whole** percentage.

(Total 2 marks)

3. Which **one** of the following events is **not** an example of a natural hazard?

Shade **one** circle only.

A Tsunami ⬭

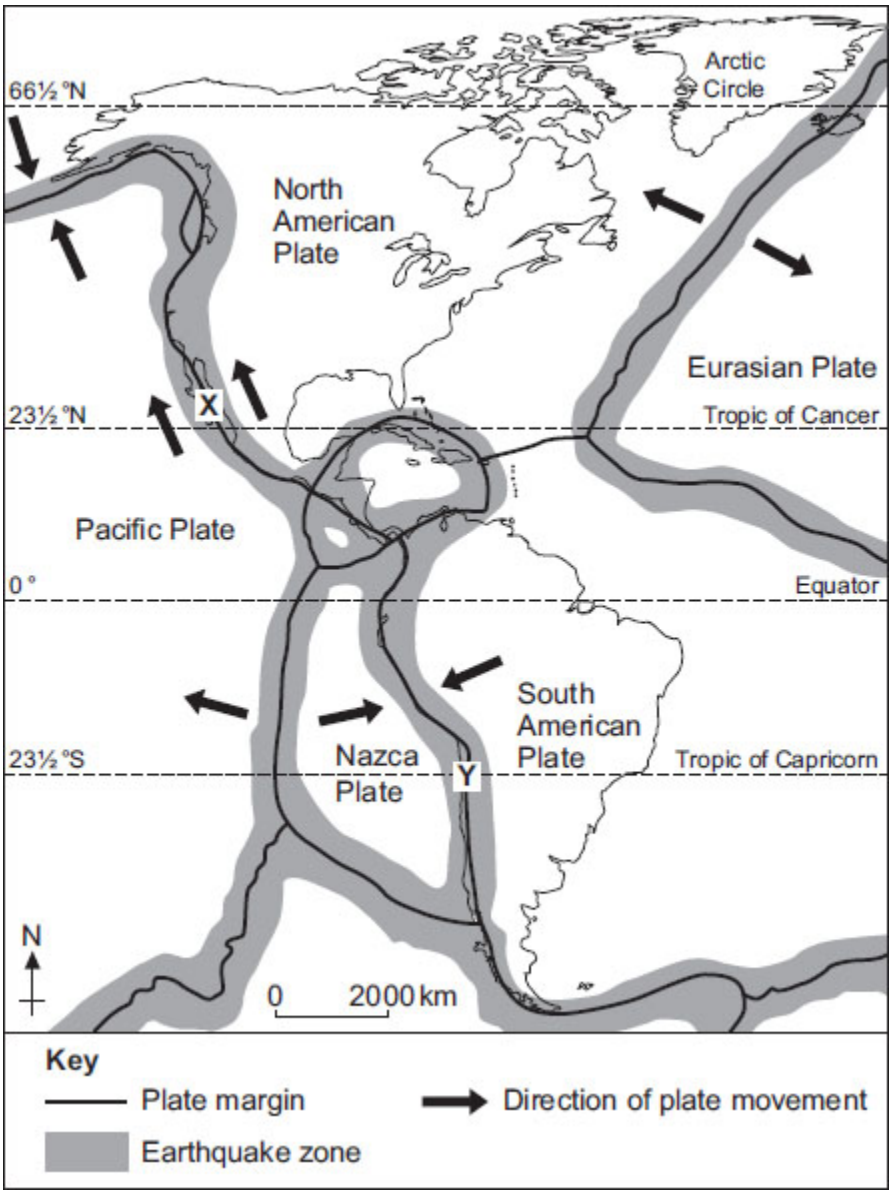
B Earthquake ⬭

C Volcanic eruption ⬭

D Oil spill ⬭

(Total 1 mark)

4. Study the map below showing the tectonic plates in and around North America and South America.



(a) Using the map above, which **one** of the following statements is true?

Shade **one** circle only.

A The Nazca Plate is moving towards the Pacific Plate. ⬭

B Earthquakes are found in long narrow zones along plate margins. ⬭

C Earthquakes are mainly found along the eastern sides of continents. ⬭

D The North American Plate is moving away from the Pacific Plate. ⬭

(1)

(b) Using the map above, name the type of plate margin at **X**.

(1)

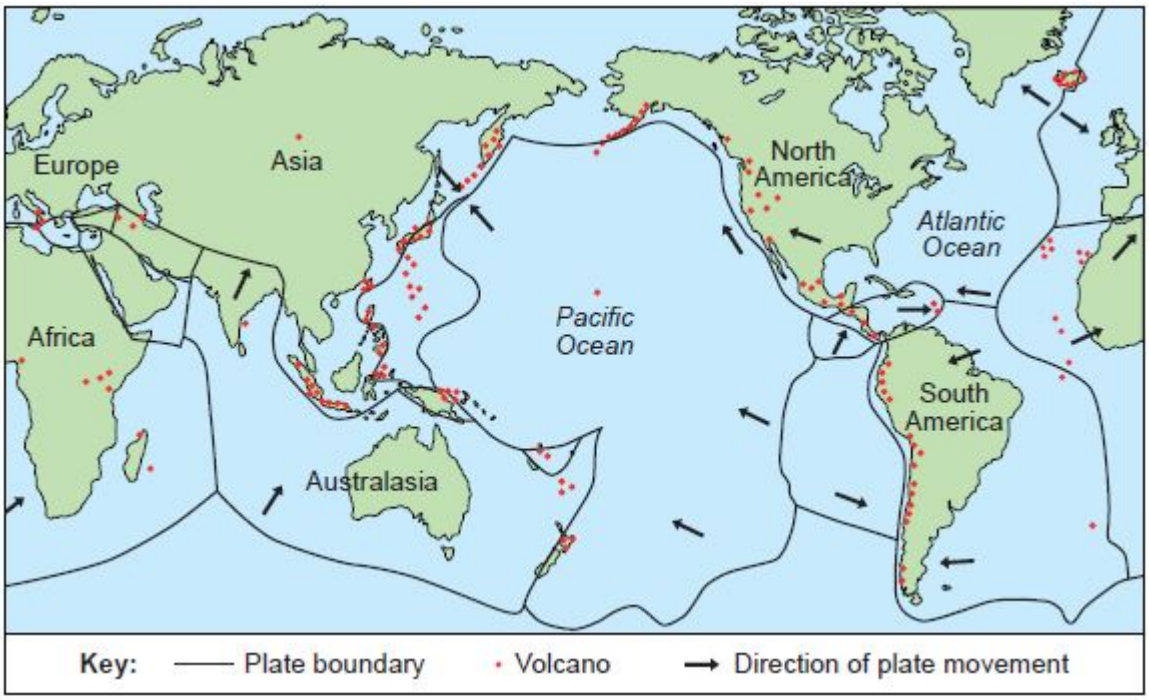
(c) Suggest why earthquakes and volcanic eruptions happen close to the plate margin at **Y**.

Use the map above and your own understanding.

(4)

(Total 6 marks)

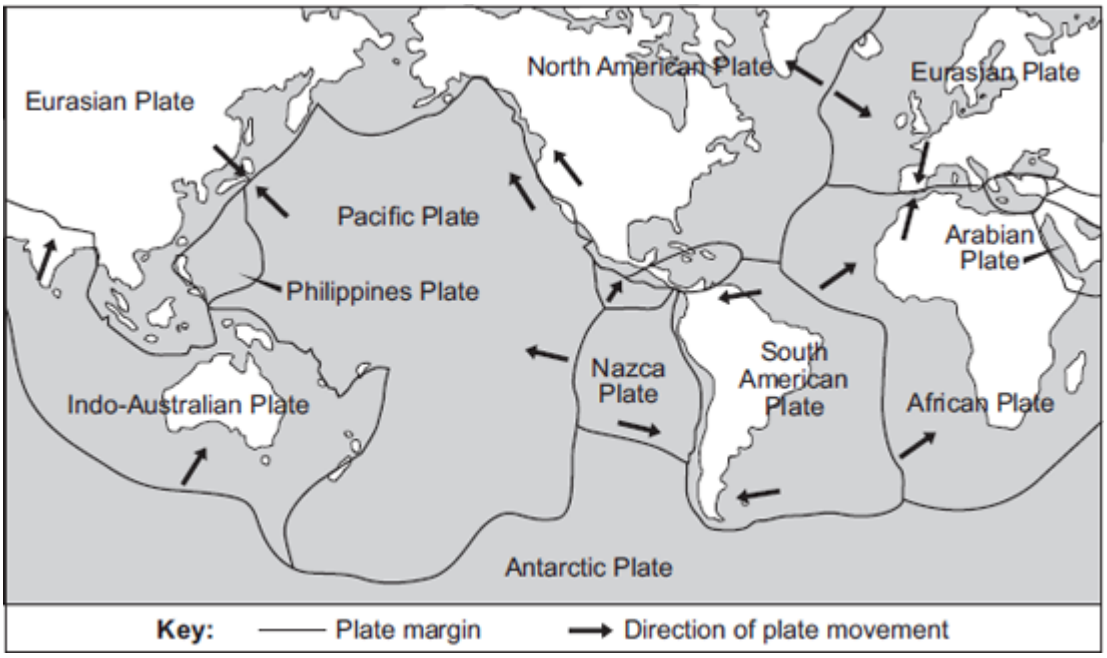
5. Study the figure below, a map showing the world distribution of volcanoes.



Describe the world distribution of volcanoes.

(Total 3 marks)

6. Study the figure below, a map showing the earth's tectonic plates and margins (boundaries).



(a) With the help of the figure given, outline differences between constructive and destructive plate margins.

(3)

(b) Give **one** example of a conservative plate margin shown in the figure above.

(1)

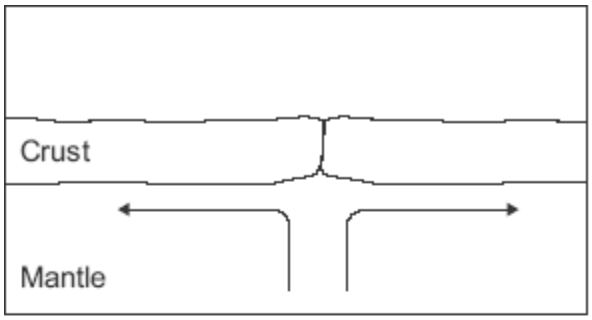
(Total 4 marks)

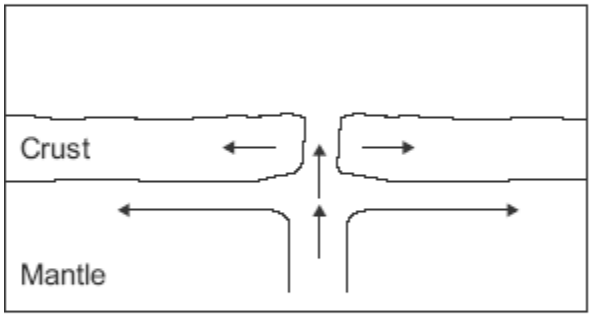
7. Explain why a tsunami is a secondary effect of plate movement.

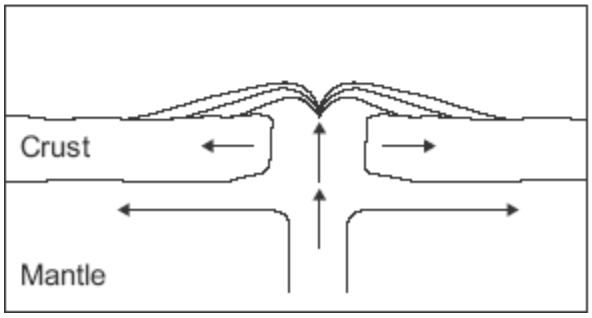
(Total 2 marks)

8. The diagram below shows that volcanoes are formed at constructive plate boundaries.

Write a sentence in each box to explain why volcanoes occur at constructive plate boundaries.





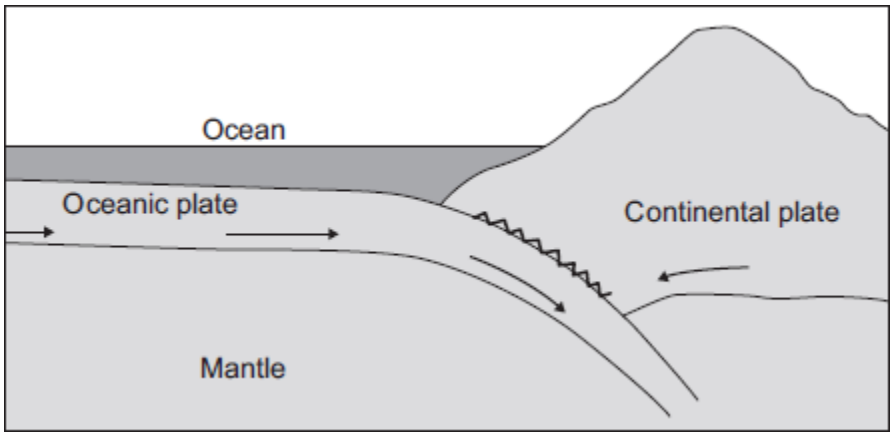


(Total 3 marks)

9. Describe the characteristics of oceanic crust.

(Total 3 marks)

10. Earthquakes occur at destructive plate margins (boundaries).
The image below shows a destructive plate margin.



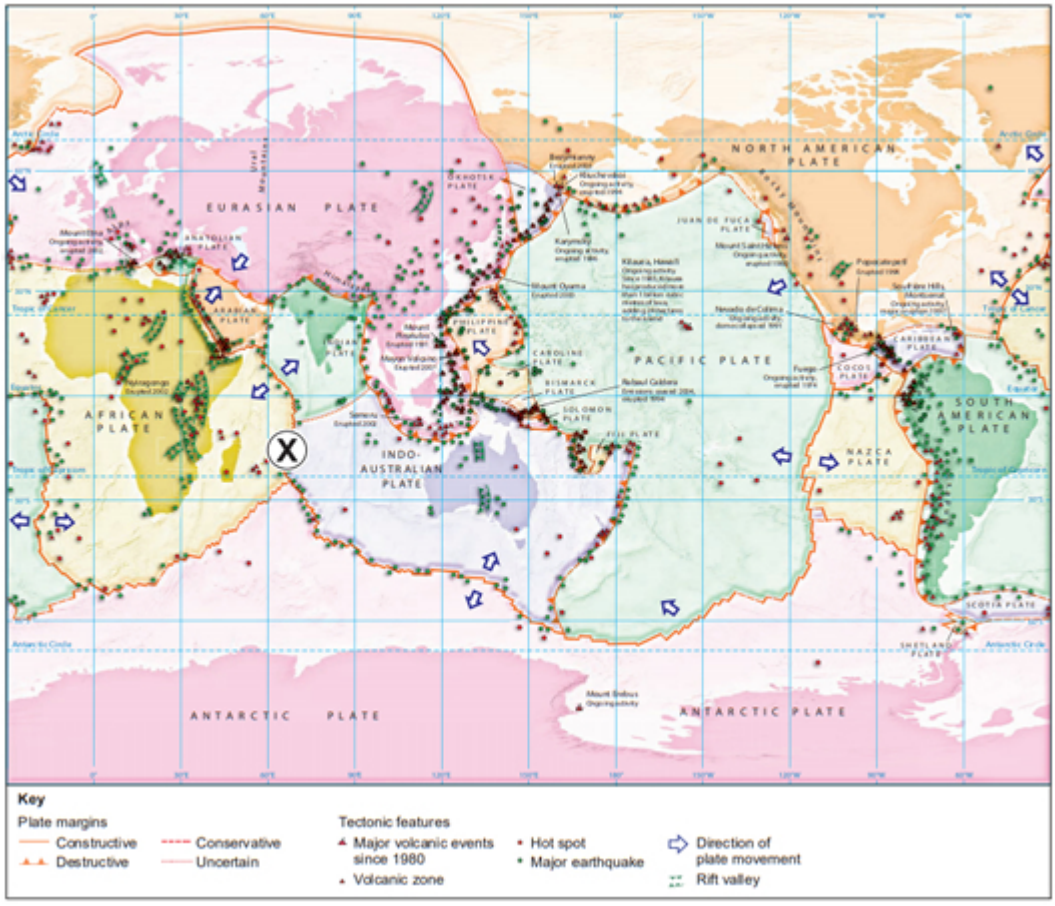
With the help of the image above, explain why earthquakes occur at destructive plate margins.

(Total 4 marks)

11. What is an earthquake?

(Total 2 marks)

12.



The Restless Earth

Study the atlas map above, showing the Earth's tectonic plates.

Use the map to complete the Fact File.

Fact File

Names of plates at **X** on the plate margin _____

plate and _____ plate

Name of volcano at 43°N 122°W _____

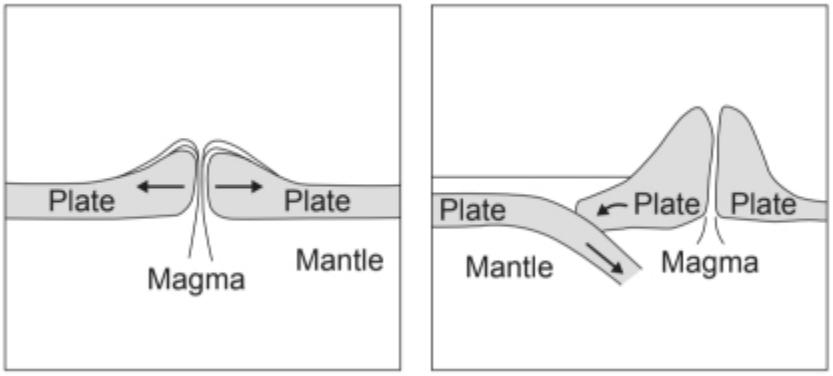
Distribution of tectonic features in South America_____

_____

_____

(Total 4 marks)

13. Study the diagram below, showing two different plate margins.



(a) What is a plate margin?

(2)

(b) Describe the difference(s) between destructive and constructive plate margins.

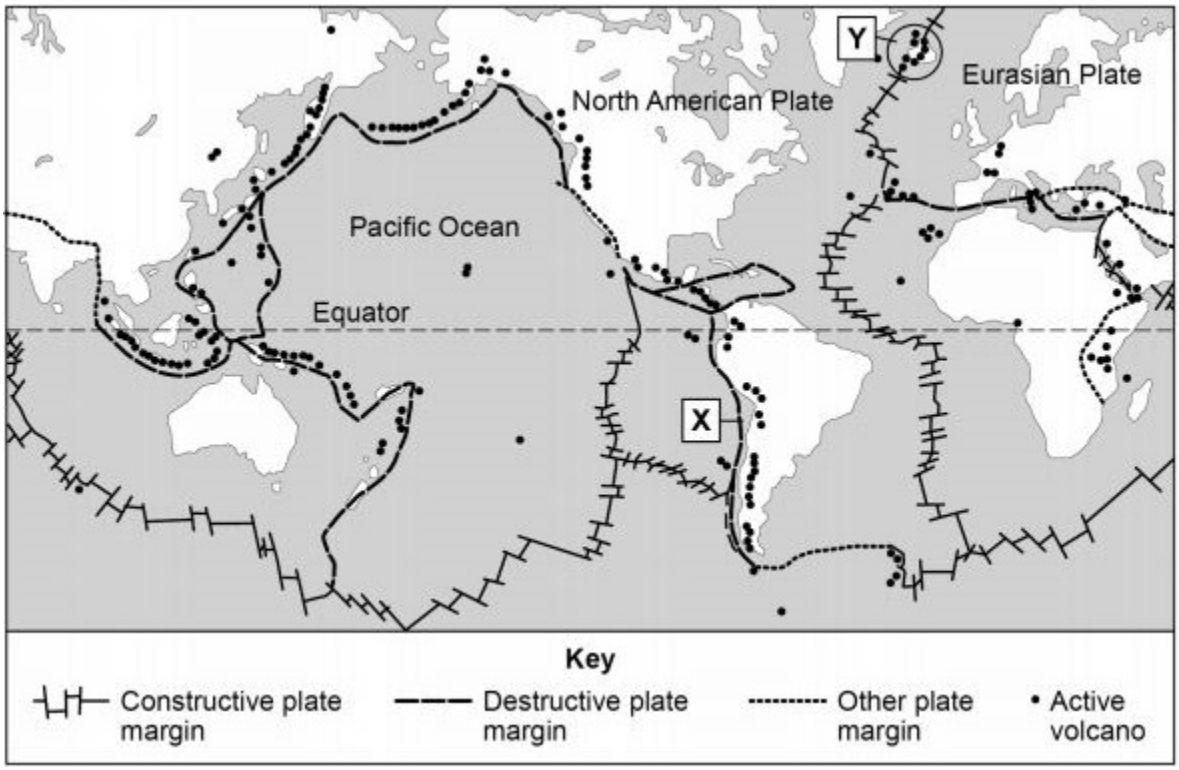
(3)

(Total 5 marks)

14. State **two** ways that planning might help to reduce the damaging effects of an earthquake or a volcanic eruption.

(Total 2 marks)

15. Study the world map below showing plate margins and active volcanoes.



(a) Using the map above which **one** of the following statements is true?

Shade **one** circle only.

A All active volcanoes occur in lines along plate margins. ⬭

B There are more active volcanoes along constructive margins than destructive margins. ⬭

C There are many active volcanoes around the edge of the Pacific Ocean. ⬭

D Active volcanoes are found along the eastern side of North and South America. ⬭

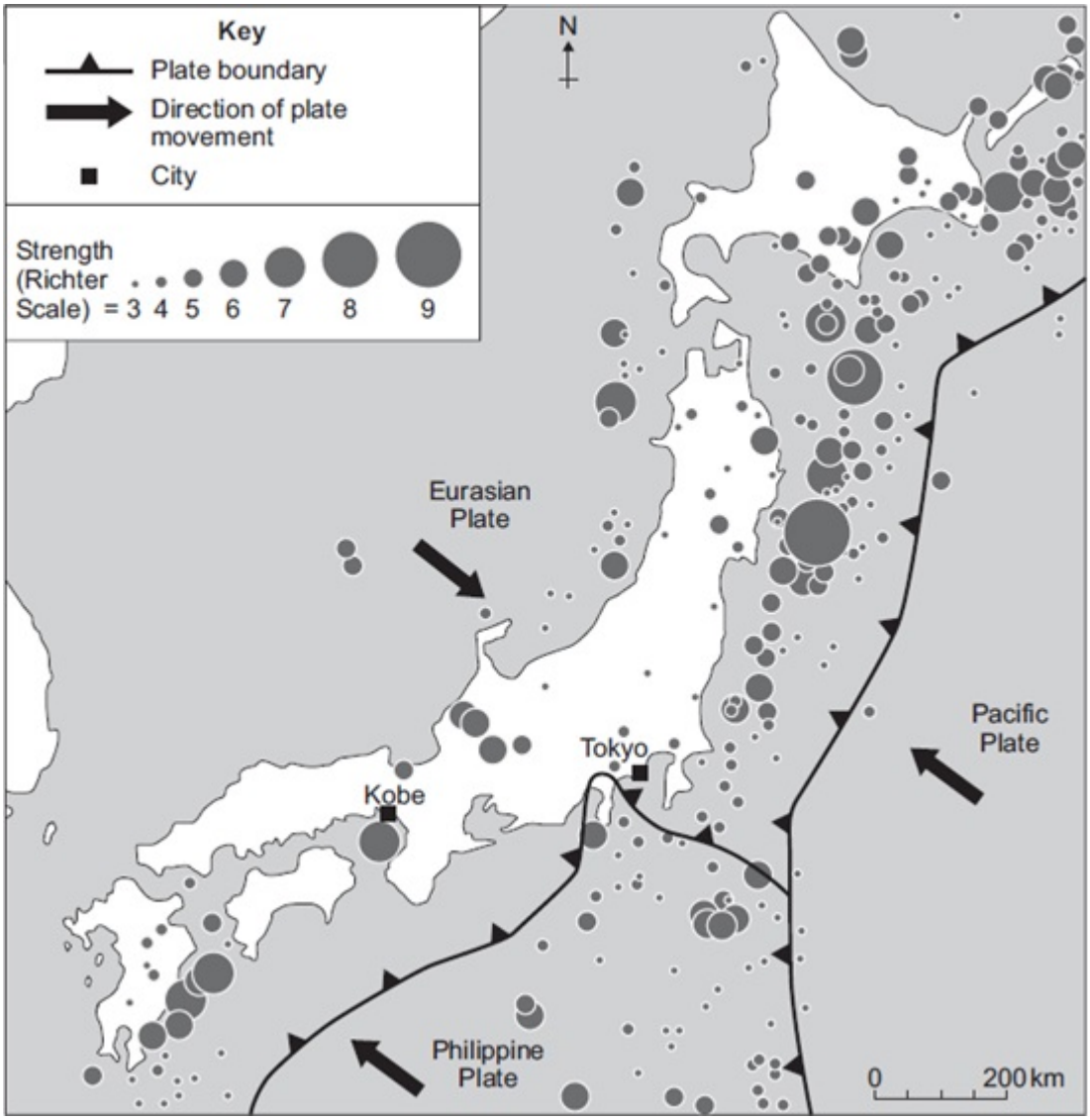
(1)

(b) Describe the movement of plates along plate margin X.

(1)

(Total 2 marks)

16. Study the map below showing the distribution of earthquakes in and around Japan.



(a) Using the map above, which **one** of the following statements is true?

Shade **one** circle only.

A Most of the stronger earthquakes happened on land. ⬭

B Most earthquakes happened to the east and south east of Japan. ⬭

C Most earthquakes around Japan were over 7 on the Richter Scale. ⬭

D No earthquakes greater than 5 on the Richter Scale happened to the west of Japan. ⬭

(1)

(b) Using the map above, name the type of plate margin between the Pacific and Eurasian plates.

(1)

(c) Suggest **one other** tectonic hazard likely to occur near to the plate margins shown in the map above.

(1)

(Total 3 marks)

Mark schemes

1.

(a) Earthquake.

AO4 – 1 mark

(b) **C** The two heatwaves in Central Europe and Russia resulted in 126 000 deaths.

No credit if two or more answers are circled.

AO4 – 1 mark

[2]

2.

34% (2 marks) Working and units not needed.
Allow 1 mark for evidence of correct working even if final answer is wrong.
Allow maximum 1 mark if figure expressed with 1–2 decimal places (33.8 or 33.82).

AO4 – 2 marks

[2]

3.

D: Oil spill

No credit if two or more answers are shaded.

AO1 – 1 mark

[1]

4.

(a) **B** Earthquakes are found in long narrow zones along plate margins.

No credit if two or more answers are circled.

AO4 – 1 mark

(b) Conservative/passive/transform

1

(c)

Level	Marks	Description
2 (Clear)	3 – 4	AO2 Shows clear geographical understanding of the processes causing volcanic and earthquake activity. AO3 Demonstrates reasonable application of knowledge and understanding in analysing why tectonic activity occurs along the western side of South America.
1 (Basic)	1 – 2	AO2 Shows limited geographical understanding of the processes causing volcanic **and/or** earthquake activity. AO3 Demonstrates limited application of knowledge and understanding in analysing why tectonic activity occurs along the western side of South America.
	0	No relevant content.

- **Level 2 (clear)** will have linked or elaborated statements and some accurate use of geographical terms. Clear sequence with processes explained.

- **Level 1 (basic)** may comprise simple statements with limited subject vocabulary. Partial sequence or random points made.

- Max Level 1 for explanation of tectonic activity at constructive or conservative margins.

- Max Level 1 for explanation of one of earthquakes or volcanoes only.

- There should be some (implied) reference to Figure 2 to access Level 2. Understanding processes at a destructive margin is sufficient reference.

Indicative content

- The command word is “suggest” so responses should set out the likely causes of both volcanoes and earthquakes from the source, showing an understanding of the processes involved. The map shows a destructive plate margin.

- Accept explanations that refer to slab pull and gravitational movement of plates: the denser plate sinks into the mantle under the influence of gravity, which pulls the rest of the plate along behind it (slab pull).

- Credit also the more conventional theory of the movement of convection currents in the upper mantle as the mechanism for plate movement and subduction.

- Understanding of processes causing volcanic activity at destructive margins. Two plates move towards each other. The denser plate sinks below the lighter, less dense plate and melts in the subduction zone. Hot magma rises up through the overlying mantle and lithosphere, and some can eventually erupt out at the surface producing volcanoes.

- Credit the idea that magma becomes increasingly viscous or sticky as it rises to the surface, producing composite volcanoes which are steep sided and have violent eruptions.

- Understanding of earthquakes at destructive margins. As the two plates converge, pressure builds up. The rocks eventually fracture causing an earthquake. Most happen at shallow depths below the surface where the plates collide. They also occur at greater depth, in the lower part of the subduction zone.

- Application of knowledge and understanding to the map. The Nazca Plate is subducted beneath the South American Plate. Expect recognition that this plate boundary is destructive and that the denser ocean crust is subducted.

AO2 – 2 marks
AO3 – 2 marks

[6]

5. *This mark scheme is from a question paper that assessed a previous specification and has not been edited.*

Click [here] to access a document explaining the differences that might apply to it.

Volcanoes occur in lines, such as along the west coast of North and South America. There are many clustering along the edge of the Pacific Ocean, especially in / near Japan. There are small clusters in places such as Iceland, southern Italy. They tend to follow the plate margins such as in the middle of the Atlantic Ocean where the plates are moving apart or near Japan where the plates are moving together. This is not always the case and some such as Hawaii are a long way from plate margins and occur relatively isolated.

3 × 1 per basic point. (1 + 1) + 1 if one point elaborated.

AO2 = 2
AO3 = 1

[3]

6. *This mark scheme is from a question paper that assessed a previous specification and has not been edited.*

Click [here] to access a document explaining the differences that might apply to it.

(a) Any 3 points relating to difference that can be derived from the figure, e.g.
constructive plate margins occur where plates move away from each other – as with the North American plate and Eurasian plate in the Atlantic Ocean, whereas destructive plate margins are found where plates move towards each other – as is the case with the Nazca plate and the South American plate. New crust formed versus destroyed. Landforms at different plate margins.
3 × 1. Must have 1 mark at least on each plate margin.

AO2 – 1
AO3 – 2
3

(b) North American plate and Pacific plate or can be indicated via location.

AO3 – 1
1

[4]

7. *This mark scheme is from a question paper that assessed a previous specification and has not been edited.*

Click [here] to access a document explaining the differences that might apply to it.

Idea what a secondary effect is for, 1 mark, and reason why for 1 mark.
Secondary effect is an effect that occurs later/is a knock-on effect (1) resulting from the earthquake a primary effect (1).
The earthquake displaced sea water (1) + (1) for further development, e.g. which moves towards the land, gaining in height in its final approach.

AO1 – 2

[2]

8. *This mark scheme is from a question paper that assessed a previous specification and has not been edited.*

Click [here] to access a document explaining the differences that might apply to it.

Statement must match diagram. Any valid statement;
statements should be different and sequential. 1 mark per box.
Box 1 – plates move apart / plates move due to convection currents / one plate moves west, while other moves in opposite direction.
Box 2 – plates move apart and resulting gap between plates is plugged / magma rises (not lava).
Box 3 – continued movement / rising magma leads to new layers of magma / magma cools / volcano forms / volcanoes get bigger.

AO1 – 1
AO2 – 1
AO3 – 1

[3]

9. *This mark scheme is from a question paper that assessed a previous specification and has not been edited.*

Click [here] to access a document explaining the differences that might apply to it.

Oceanic crust is generally less than 200 million years old – some is much newer – a million years old in Iceland. It is dense and can sink beneath continental crust. Oceanic crust can be renewed at constructive plate margins and destroyed at subduction zones. The characteristics may be described in a comparative way with reference to continental crust.

1 mark for a list of 2 characteristics.

3 × 1 per basic point, 1 + 1 per elaborated point + 1 any combination.

AO3 = 1

[3]

10. *This mark scheme is from a question paper that assessed a previous specification and has not been edited.*

Click [here] to access a document explaining the differences that might apply to it.

Two plates move towards each other. One is made of oceanic crust and one of continental crust. The oceanic plate is denser than the continental. It sinks beneath the continental plate – which is subduction. This exerts great pressure on the crust and on the release of pressure that has built up over time causes the plates to shift and results in an earthquake.
4 × 1 for any valid statement.

AO1 – 2
AO2 – 1
AO3 – 1

[4]

11. *This mark scheme is from a question paper that assessed a previous specification and has not been edited.*

Click [here] to access a document explaining the differences that might apply to it.

An earthquake is vibrations / movement / tremors / shockwaves in the earth's crust. These are sudden / without warning and brief / last for seconds.

2 × 1

AO1 – 2

[2]

12. *This mark scheme is from a question paper that assessed a previous specification and has not been edited.*

Click [here] to access a document explaining the differences that might apply to it.

Name of plates at X on the plate margin	African and Indo-Australian
Name of volcano at 43°N 122°W	Mt St Helens
Distribution of tectonic features in South America	The western area has many earthquakes – extending right along the coast; some volcanoes occur in the same areas, such as the north western area near the Equator and in a line following the west coast. These occur in a fold mountain range – the Andes at a (destructive) plate boundary.

AO2 – 2
AO3 – 2

1 mark for each of the first two parts and 2 × 1 for simple points or 1+1 for an elaborated point for the final part.

[4]

13. *This mark scheme is from a question paper that assessed a previous specification and has not been edited.*

Click [here] to access a document explaining the differences that might apply to it.

(a) A plate margin is the boundary / location where two slabs of earth's crust meet. This may be the meeting of crust of the same type or different types – such as oceanic and continental.
2 × 1 per simple point, 1 + 1 for an elaborated point

AO1 = 1
AO3 = 1

(b) A constructive plate margin occurs where two plates move apart, whereas plates move together at a destructive plate margin. New crust is created at a constructive plate margin where it can be melted and destroyed at a destructive plate margin. Contrasting landforms occur at the different margins with fold mountains being found at destructive margins together with ocean trenches and composite volcanoes instead of mid-ocean ridges and shield volcanoes and rift valleys at constructive margins. Eruptions are more violent and earthquakes more severe at destructive plate margins.
Allow 1 mark for separate accounts.
3 × 1 per simple point, 1 + 1 for an elaborated point +1

AO1 = 1
AO2 = 1
AO3 = 1

[5]

14. Prepare emergency aid and distribution (1). Practise earthquake/volcano drills. (1) Plan evacuation routes (1). Stockpile blankets, clean water and food (1). Educate people so they know what to do if an earthquake or volcano happens (1). Prepare hazard maps to show areas most at risk of damage (1).

2 separate ways are required.

AO1 – 2 marks

[2]

15. One mark for the correct answer:

(a) C. There are many active volcanoes around the edge of the Pacific Ocean.

No credit if two or more statements are shaded

AO4 = 1

(b) This question requires application of knowledge to the source.

Plates are coming together / converging / colliding.
One plate is pushed (subducted, sinks) under the other.
The ocean floor is moving under the continental plate.

No credit for explanations of plate movement or for stating destructive margin.

AO3 = 1

[2]

16. (a) B. Most earthquakes happened to the east and south east of Japan.

One mark for correct answer:

No credit if two or more answers are circled.

AO4 – 1 mark

(b) Destructive, convergent

No credit for description of movement such as moving towards each other.

AO4 – 1 mark

(c) Volcano/volcanic eruption, tsunami

No credit for non-tectonic hazard

AO3 – 1 mark

[3]