# Plate tectonics: theory, types of margin & associated features *3.1.5.2* ANSWERS

| Q1 | *True or False?* | |
|---|---|---|
| A | Convection currents in the mantle are caused by radioactive decay in the earth's core producing heat. | **True** |
| B | Young fold mountains are found on constructive plate margins. | **False** |
| C | Seismic activity is common along destructive plate margins. | **True** |
| D | Sea floor spreading occurs at conservative plate margins. | **False** |
| E | Palaeomagnetism is used to determine historical crustal movements due to magnetism of metals in rocks. | **True** |

| Q2 | **Match the correct term to the correct definition** | |
|---|---|---|
| A | The occurrence or frequency of earthquakes in an area. | **Seismicity** |
| B | A branch of science studying volcanic action. | **Vulcanicity** |
| C | The edge of each tectonic plate. | **Plate margin** |
| D | A segment of the Earth's crust. | **Tectonic plate** |
| E | The transfer of heat through a region of the earth's interior. | **Convection current** |

Select from: **Tectonic plate** **Convection current** **Seismicity** **Vulcanicity** **Plate margin**

| Q3 | **One sentence is incorrect in each of the explanations below. Identify the wrong one.** |
|---|---|
| A | The core releases heat which rises through the mantle. ~~As the heat reaches the crust it slows, heats up and then falls back down into the mantle.~~ This process causes plates to move. |
| | **As the convection current rises vertically it reaches the crust, spreads laterally, cools as it moves away from its heat source and then descends back down into the mantle.** |
| B | ~~A collision margin is where two oceanic plates move together.~~ Neither plate can be subducted, so they collide and push up sediments to form fold mountains. These mountains are some of the highest in the world. The Himalayas are an example of a fold mountain range. |
| | **A collision margin is where two continental plates move towards each other. They are both of a low density so neither can be subducted so they collide and push upwards.** |
| C | A conservative margin is when two plates move alongside each other. Neither plate is subducted and therefore there is no volcanic activity associated with this margin. ~~Deep focus earthquakes occur here which are gentle and result in few impacts.~~ |
| | **As neither plate is subducted, there is no plate movement deep underground, therefore the pressure that builds up between the plates is always close to the earth's surface. As a result, you get shallow focus earthquakes which are powerful in nature and can cause large numbers of deaths and structural damage.** |
| D | A rift valley occurs at a continental divergent/constructive plate boundary whereby the plates move apart and the subsequent land in the middle of the two plates subsides. ~~The valley experiences no volcanic activity due to the lack of material being fed into the area and the fact that no crust is being destroyed at this point.~~ The African rift valley is one of the earth's largest. |
| | **Volcanic activity does occur in a rift valley, as the forces that drag the plates apart cause a thinning of the crust and magma underneath is able to find a path out to the surface.** |
| E | ~~Composite volcanoes are formed at constructive margins where plates move apart.~~ Magma fills the gap left by the plate separation and non-viscous lava flows over the surface and eventually solidifies to form a wide, shallow sloped volcano. The magma is basaltic in origin and largely fluid. |

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| | |
|---|---|
| | **The explanation refers to shield volcanoes which are found at constructive margins. Composite volcanoes on the other hand are formed at destructive margin, where the lava is much thicker in nature and a steep sided explosive volcano is created.** |

| Q4 | ***Decide which heading the various features & processes would match with, in reference to plate margin type*** | |
|---|---|---|
| ***Constructive margin*** | ***Destructive margin*** | ***Conservative margin*** |
| Shield volcano<br><br>Low magnitude earthquakes are common<br><br>Ocean ridges | Young fold mountains<br><br>Cone volcano<br><br>Subduction<br><br>Deep sea trenches<br><br>Deep earthquake foci | High seismicity but little volcanicity |

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| Q5 | ***Think about the implications for people living in areas associated with tectonic activity.*** |
|---|---|
| A | **What are some of the future negative implications?**<br><br>Potential high death toll and high cost of rebuilding after high magnitude earthquakes.<br><br>Perception of risk may require over-engineering and emergency service provision<br><br>Secondary effects, including pyroclastic flows and tsunamis causing high death tolls.<br><br>Long term effects on the economy following a seismic or volcanic event. |
| B | **What are some of the future positive implications?**<br><br>Adaptation strategies will enable people to live in any location, e.g. earthquake proofing for buildings and prediction and warnings for the population.<br><br>Harnessing geothermal energy which is carbon neutral and renewable.<br><br>Fertile soils in volcanic regions.<br><br>Volcano tourism. |