



Subject: Grade 10 Geography
Topic: Geography: Term 2 - Exam 1
Total: 152 Marks

1. D: Sedimentary

4 marks

Explanation:

Fossils are found in sedimentary rocks because **these rocks form in layers under gentle conditions**. Fossils are the preserved remains or traces of plants and animals from millions of years ago.

Why **not igneous** or **metamorphic** rocks?

- **Igneous rocks** form **from hot magma or lava**, which would **destroy any fossils**.
- **Metamorphic rocks** form under **extreme heat and pressure**, which would **crush or change any fossils**.

Sedimentary rocks, on the other hand, form when layers of sand, mud, or small rock pieces **slowly build up over time, gently covering** and **preserving** dead plants and animals. The pressure from these layers helps fossilise the remains.

Examples of fossil-rich sedimentary rocks: Limestone, shale, and sandstone.

2. B: Shield volcano

4 marks

Explanation:

Shield volcanoes have wide, gentle slopes formed by runny basaltic lava that can travel long distances before solidifying (becoming hard). These eruptions are typically non-explosive, allowing layers of lava to accumulate slowly over time. The shape resembles a warrior's shield lying flat on the ground, which is where the name comes from.



3. true

2 marks

Explanation:

The mantle is a layer of the Earth located **beneath the crust**, and it behaves like a **very slow-flowing, thick liquid**. When the **Earth's core heats the mantle**, the hot material rises towards the surface, while cooler material sinks back down. This **circular movement**, called **convection**.

Convection currents are the circular movements that happen in a fluid (like the Earth's mantle) when the fluid is heated. This is how they work:

- **Heating:** The Earth's core gets very hot and heats the material in the mantle.
- **Rising:** As the mantle material heats up, it becomes less dense and rises towards the surface.
- **Cooling:** When the material reaches the surface, it cools down, becomes denser, and sinks back towards the core.

This process **repeats** in a **circular motion**, with hot material rising and cool material sinking, creating a **convection current**.

These currents are what move the Earth's tectonic plates. As the mantle material moves, it pushes the plates above it in different directions.

4. block • upwards • downwards • properties

8 marks

Explanation:

When rocks fracture along faults, blocks of the crust can move in different ways depending on the direction and type of stress. If a **block is uplifted**, it forms a mountain, often called a **block mountain**.

If a **block slips downward**, it forms a valley, sometimes called a **rift valley**.

The final landform depends on whether the stress is compressional, tensional, or shear, how the blocks move relative to each other, and the strength, composition, and thickness of the rocks involved.

5. plate • active • lithosphere • relative

10 marks

Explanation:

Faults form most commonly **along plate boundaries** because these are the most active parts of the Earth's lithosphere. **Stress accumulates as plates move relative to each other**. When the stress exceeds the strength or properties of the crust, rocks fracture, forming faults. The type of plate boundary, the rate and direction of movement, and the composition of the crust influence the type of fault and associated landforms, such as block mountains, rift valleys, or earthquake zones.

6. false

2 marks

Explanation:

Most earthquakes are caused by natural geological processes such as tectonic plate movement, fault activity, and volcanic eruptions. While **human activities** like mining or dam building can trigger small earthquakes, they **represent a tiny percentage of total seismic events globally**.

7. B: Relief (also known as orographic)

4 marks

Explanation:

Relief (or orographic) rainfall occurs when **moist air is forced upwards over a mountain range**, cools, and condenses, resulting in rain.

It is **typically found on the windward side** of mountains (the side of the mountain which faces the ocean) and contributes to fertile regions with abundant vegetation. The leeward side of the mountain (the side away from the ocean) remains dry and is called the rain shadow.

8. B: It causes cloudy skies and often stormy weather.

4 marks

Explanation:

A **low pressure system** is a weather pattern where **air is constantly rising from the ground**. As the **air rises**, it **cools down and condenses**, which **causes clouds to form**.

The rising air in a low pressure system creates an area where the **air pressure is lower** than the surrounding areas, and **this can lead to stormy weather**.

Because the air is rising, it pulls in more moist air from the surrounding areas. This extra moisture also contributes to the formation of clouds and precipitation, such as rain, snow, or thunderstorms. The lack of sinking air means that the weather is less stable and can change quickly.

9. Ring of Fire | Ring of Fire. | The Ring of Fire | The Ring of Fire.

3 marks

Explanation:

The **Ring of Fire** is a horseshoe-shaped area that **follows the edge of the Pacific Ocean**. It is **home to about 75% of the world's active volcanoes and experiences frequent earthquakes**. This is because it contains many active plate boundaries where tectonic plates meet. Recognising this area is important when understanding global earthquake distribution.

10. syncline | Syncline. | sincline | Sincline.

3 marks

Explanation:

A syncline is a fold in rock layers where the rocks bend downward into a trough or U-shape. In a syncline, the **youngest rock layers are found in the centre of the fold, while the older layers are on the outside**. This happens because **compressional forces squeeze the rock layers from both sides, causing them to bend**.

Imagine gently pushing both ends of a piece of paper toward each other until it curves downward in the middle. That downward curve is like a syncline.

11. metamorphic • pressure • heat

6 marks

Explanation:

In the **rock cycle**, **sedimentary rocks** can be **changed into metamorphic rocks** when they are exposed to **extreme heat and pressure** deep within the Earth. This heat and pressure cause the minerals in the sedimentary rocks to change and rearrange.

New minerals and a new structure form, resulting in a completely different rock type. For example, limestone (a sedimentary rock) can turn into marble (a metamorphic rock) under heat and pressure.

12. true

2 marks

Explanation:

Ocean floor spreading happens at **mid-oceanic ridges**, which are **underwater mountain ranges** found in the middle of the oceans. At these ridges, **two oceanic plates are moving apart**.

As the **plates separate**, **magma from the Earth's mantle rises up** to fill the gap. When the **magma cools and solidifies**, it forms **new oceanic crust**. This process continues over time, pushing the older crust away from the ridge and **creating new sections of the ocean floor**.

13. decreasing • decreasing

2 marks

Explanation:

Troposphere (A): Temperature **decreases** with height because it's heated by the Earth's surface, so the **air becomes cooler as you move further away from the surface**.

Stratosphere (B): Temperature **increases** with height due to the **ozone layer absorbing ultraviolet (UV) radiation**.

Mesosphere (C): Temperature **decreases** with height as there's a small amount of ozone, and **heat escapes into space**.

Thermosphere (D): Temperature **increases** with height as **solar radiation heats the sparse particles**.

14. A: Oceanic crust is denser than continental crust.

4 marks

Explanation:

When oceanic and continental plates collide, the **oceanic plate sinks under the continental plate** because it is **heavier**. **Oceanic crust is made of basalt**, which is **denser**, while **continental crust is made of granite**, which is **lighter**.

Since heavier things sink under lighter ones, the **oceanic plate gets pushed down into the Earth**, forming a **subduction zone**. As the **oceanic plate sinks deeper**, it **melts due to the intense heat and pressure**. This melted rock, called magma, **can rise to the surface and create volcanoes**. This process **also causes earthquakes and forms deep trenches in the ocean**.

15. 1 | one | 1. | One.

3 marks

Explanation:

If temperatures rise significantly, the process that would increase the most is **evaporation**. **As the temperature increases, water molecules gain more energy**, causing more water to change from **liquid to gas (vapour)**.

16. false

2 marks

Explanation:

The **crater** is typically **at the summit or top** of the volcano. It is formed either by the collapse of land after an eruption or by explosive removal of material during an eruption.

17. divergent • transform • energy • fault • transform • divergent

10 marks

Explanation:

At **divergent boundaries**, plates are moving away from each other. This movement usually happens gradually and creates smaller cracks that allow magma to rise, producing weaker and deeper earthquakes that cause less surface damage.

At **transform boundaries**, plates slide past each other. Friction prevents smooth movement, so pressure builds up over a long time. When this energy is suddenly released along faults, it creates shallow-focus earthquakes that are stronger and more destructive.

Transform boundary earthquakes are more destructive because they are shallow, sudden, and release larger amounts of built-up stress compared to the smaller, more gradual earthquakes at divergent boundaries.

18. false

2 marks

Explanation:

Latent heat, or hidden heat, is the **energy a substance needs to change from one state to another**, like when ice melts into water or water turns into steam. This energy goes into changing the arrangement of particles in the substance, but it **doesn't cause the temperature to change**.

For example, when ice melts, it absorbs energy, but it stays at 0°C until all the ice has turned to water. So, latent heat is all about changing the substance's state without affecting its temperature.

19. C: GPS tracking of plate movement.

4 marks

Explanation:

The **Continental Drift theory**, proposed by **Alfred Wegener**, was based on **evidence** available in the early 1900s. He observed that:

- **Matching fossils** were found on **continents now separated by oceans**, suggesting they were once connected.
- **Identical rock formations** appeared on **different continents**, showing they were once part of the same landmass.
- **The shape of coastlines** fit together like **puzzle pieces**, especially South America and Africa.

However, GPS tracking of plate movement was not part of Wegener's evidence. GPS technology did not exist in his time. It was only later, with the discovery of plate tectonics, that scientists could measure plate movement using satellites.

20. C: Rift valleys

4 marks

Explanation:

At **divergent boundaries**, two tectonic **plates move away from each other**. As they separate, **magma rises** to fill the gap, creating new landforms.

On land, this process **forms rift valleys**, which are large, elongated depressions in the Earth's crust. A well-known example is the East African Rift Valley.

In the ocean, divergent boundaries **create mid-ocean ridges**, like the Mid-Atlantic Ridge, where new ocean floor is constantly being formed.

The **other options are not formed at divergent boundaries**:

- **Deep-sea trenches** form at **convergent boundaries** where one plate subducts under another.
- **Volcanic island arcs** form at **convergent boundaries** when an **oceanic plate subducts under another oceanic plate**.
- **Fold mountains** form at **convergent boundaries** when two continental plates collide and push upwards.

21. false

2 marks

Explanation:

Warm fronts usually bring **gradual, steady rain** or **drizzle** and **clouds**, not immediate thunderstorms. Thunderstorms are more likely with cold fronts or unstable air masses.

22. B: Line with triangles

4 marks

Explanation:

A **cold front** is shown on a **weather map with triangles that point in the direction the cold air is moving**. These triangles help us see where the cold air is pushing forward.

Cold air is heavier and moves close to the ground, so when it meets warm air, it pushes the warm air upward. As the warm air rises, it cools down and forms clouds, often **leading to rain, thunderstorms, and strong winds**.

After a cold front passes, the temperature usually drops, and the weather becomes cooler and clearer. The triangles on the map make it easy to see where the cold air is going and what kind of weather changes to expect.

23. liquid • solid

4 marks

Explanation:

The Earth's core has two parts:

The **outer core** is **liquid** because it is **extremely hot**. The heat melts the metals inside (mainly iron and nickel), turning them into a thick, flowing liquid. This movement helps create the Earth's magnetic field.

The **inner core** is **solid** even though it is **even hotter**. This is because the **pressure deep inside the Earth is so strong that it squeezes the metal tightly together**, stopping it from melting.

24. true

2 marks

Explanation:

Heat from the Earth's core causes **convection currents** in the mantle. Hot, less dense material rises, cools near the surface, and sinks again, creating circular motions.

These movements slowly **push and pull the lithospheric plates** on the Earth's surface, explaining the **movement of continents, formation of mountains, ocean basins, and volcanic activity** over geological time.

25. Absorption

3 marks

Explanation:

Absorption is the process where the Earth's surface **takes in solar energy, converting it to heat**. This contributes to warming the Earth's surface.

26. 25 | twenty five | twenty-five

3 marks

Explanation:

In a **weather station model**, the **wind speed** is shown by the feathers attached to a line. Each **long feather represents 10 knots** of wind speed, and **each half-feather represents 5 knots**.

This station model shows **25 knots** as the wind speed because the wind has two full feathers (representing 10 knots each) and one half-feather (representing 5 knots). This tells us that the wind is blowing at a moderate speed.

27. A: Folding occurs when rocks bend under stress without breaking, while faulting occurs when rocks fracture and move along a plane, and both processes shape landscapes differently. 4 marks

Explanation:

Folding happens when rock layers are pushed together and **bend without breaking**, creating wave-like shapes in the rocks. **Faulting** happens when the stress is too great and the **rocks actually break** and move along cracks called faults. This breaking causes sections of the Earth's crust to shift.

Folding and faulting can both happen on land or under the ocean, so location is not the main difference, and volcanic activity is not the primary cause of folding.

28. Magma | Magma.

3 marks

Explanation:

Magma exists under the Earth's surface, inside the crust, in chambers. When it erupts and reaches the surface, it is called lava.

29. Magma | Magma.

3 marks

Explanation:

Magma is the **melted rock beneath the Earth's surface**. It **forms** because of the **intense heat and pressure** inside the Earth. It sits in pockets in the mantle and can move upwards. When magma breaks through the Earth's crust, it erupts as lava.

Over time, the cooling of magma (whether below the surface or above) leads to the creation of igneous rocks, like granite (when it cools slowly) or basalt (when it cools quickly). This process plays a huge role in shaping the Earth's surface.

30. true

2 marks

Explanation:

Folding can occur in both soft and hard rock, but it is more common in soft rock. When rocks are under pressure, soft rocks bend more easily, which is why they are more likely to form folds.

However, if the conditions are right, such as high temperature and pressure deep within the Earth, even hard rocks can bend and form folds instead of breaking. The key is how slowly the pressure is applied and the environment in which the rock is found.

31. Primary | Primary. | P-waves | P-waves. | P waves | P waves.

3 marks

Explanation:

Primary waves (P-waves) travel fastest and arrive first at a seismograph station. They move through solids, liquids, and gases by compressing and expanding the material they pass through. They are less destructive than other waves but useful for early warnings.

32. pressure

4 marks

Explanation:

Isobars are used to **show air pressure**, which affects wind speed and weather conditions. Meteorologists can quickly see where high and low-pressure systems are forming.

Isotherms, on the other hand, **help track temperature changes** across a region. They connect places with the same temperature, which helps in predicting heat waves or cold fronts.

33. pressure • sudden • bending • properties

10 marks

Explanation:

Faults occur when rocks **break** because the **stress is strong** or sudden, often along pre-existing weaknesses.

Folds occur when rocks **bend** under **slow stress** over long periods.

The way rocks respond depends on the type of stress, how quickly it is applied, and the properties of the rocks, such as their composition, temperature, pressure, and thickness. Brittle rocks tend to fracture more easily while more flexible rocks can bend without breaking.

34. A: The magnitude of an earthquake.

4 marks

Explanation:

The **Richter scale** is used to **measure the magnitude of an earthquake**, which means **how much energy it releases**.

The scale goes from 0 upwards, with each number being 10 times stronger in shaking and about 32 times more powerful in energy. A 6.0 earthquake is 10 times stronger than a 5.0 in terms of wave amplitude. This helps scientists compare how powerful different earthquakes are.

35. anticlockwise • clockwise

4 marks

Explanation:

The way winds rotate around pressure systems is due to the **Coriolis effect**, caused by Earth's rotation. In the **Southern Hemisphere**, it **deflects winds to the left**, making **high pressure systems** (anticyclones) rotate **anticlockwise** and **low pressure systems** (cyclones) rotate **clockwise**.

The Coriolis effect is a force caused by Earth's rotation that makes moving air curve instead of traveling in a straight line.

36. Sedimentary | Sedimentary. | Sedimentary rock | Sedimentary rock. | Sedimentary rocks | Sedimentary rocks.

3 marks

Explanation:

Sedimentary rocks are formed when **small particles of sand, clay, minerals, or organic material**, like plants and shells, are **pressed together over time**.

These particles are carried by wind, water, or ice and eventually settle in layers, usually in places like rivers, lakes, or oceans.

Over millions of years, the **layers become compacted and harden into rocks** like sandstone, shale, limestone, and coal. The materials that form sedimentary rocks can come from older rocks that have been broken down by weathering.

37. true

2 marks

Explanation:

Isobars are the **lines on a synoptic weather map** and they show **areas with the same air pressure**. This is important because air pressure differences cause wind and affect weather patterns. Isobars help meteorologists determine how strong the winds will be and where pressure systems are forming.

38. true

2 marks

Explanation:

A syncline is a downward fold in rock layers, and its limbs (the sides of the fold) dip toward the centre of the fold. This creates a **U-shaped structure**. The youngest rock layers are found in the centre of a syncline because they are deposited last in the lower part of the fold. The dipping of the limbs toward the centre is what helps geologists identify a fold as a syncline and not an anticline.

39. fault | Fault | fault. | Fault. | faults | faults.

3 marks

Explanation:

When rocks are under stress, they can either bend or break. **If the stress is too strong or the rocks are brittle, they will break instead of bending.** The break creates a crack or fracture in the Earth's crust called a **fault**. Along this fault, the rocks on either side can move relative to each other, which sometimes causes earthquakes.

40. vent

4 marks

Explanation:

The **vent** is the pathway that lava and gases use to exit the volcano. The **crater** is the depression at the summit where eruptions typically occur.

Total: 152 Marks