DIVE Earth Science Quarterly Exam 1 Practice (Sample)

Study Guide

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Questions

1. What is latitude a measure of?

- **A. Distance north and south of the equator**
- **B. Distance east and west of the prime meridian**
- **C. Elevation above sea level**
- **D. Rivers and lakes**

2. What does the term 'asthenosphere' refer to?

- **A. The outer layer of the crust**
- **B. A solid, rigid layer of the mantle**
- **C. A plastic layer of the Earth's upper mantle**
- **D. The liquid outer core**

3. What is the significance of latitude in geography?

- **A. It determines time zones.**
- **B. It indicates temperature zones.**
- **C. It measures distance north and south of the Earth's equator.**
- **D. It relates to ocean currents.**

4. What does GIS stand for in the context of geographical information?

- **A. Geographical Information System**
- **B. Global Information System**
- **C. Geometric Information System**
- **D. Geographical Index System**

5. Which term describes the water portion of Earth?

- **A. Lithosphere**
- **B. Geosphere**
- **C. Hydrosphere**
- **D. Atmosphere**

6. What does the hydroplate theory describe?

- **A. Formation of minerals**
- **B. Subduction of tectonic plates**
- **C. Separation of granitic crust across subcrustal water**
- **D. Composition of the Earth's core**

7. What is the central body of the Solar System?

A. Earth

B. Mars

C. Moon

D. Sun

8. Which term describes igneous rock that cools and solidifies beneath the earth's surface, also known as intrusive rock?

A. Volcanic rock

B. Plutonic rock

C. Basaltic rock

D. Rhyolitic rock

9. What type of rock is formed from the eroded products of preexisting rocks or through mineral precipitates?

A. Igneous Rock

B. Metamorphic Rock

C. Sedimentary Rock

D. Volcanic Rock

10. Which of the following describes the concept of contour lines?

A. Lines of constant elevation on a map

B. Paths taken by rivers

C. Lines representing human boundaries

D. Lines marking transportation routes

Answers

1. A
2. C
3. C
4. A
5. C
6. C
7. D
8. B
9. C
10. A

Explanations

1. What is latitude a measure of?

A. Distance north and south of the equator

B. Distance east and west of the prime meridian

C. Elevation above sea level

D. Rivers and lakes

Latitude is a measure of the distance north and south of the equator, which is designated as 0° latitude. It is expressed in degrees, with the North Pole at 90° North and the South Pole at 90° South. This measurement helps in pinpointing the location of a place on the Earth's surface in relation to the equator, which is a reference line that divides the planet into the Northern and Southern Hemispheres. Understanding latitude is crucial for navigation, climate studies, and geographical mapping, as it profoundly influences climatic conditions and ecosystems. The other options address different geographic concepts; for example, distance east and west of the prime meridian pertains to longitude, while elevation above sea level measures vertical distance from sea level. The mention of rivers and lakes relates more to hydrology and regional geography rather than a defined measurement like latitude.

2. What does the term 'asthenosphere' refer to?

A. The outer layer of the crust

B. A solid, rigid layer of the mantle

C. A plastic layer of the Earth's upper mantle

D. The liquid outer core

The term 'asthenosphere' refers specifically to a plastic layer within the Earth's upper mantle. This region is characterized by its ability to flow slowly over geological time scales, which allows tectonic plates situated above it in the lithosphere to move. The asthenosphere is significant because it provides the necessary conditions for the movement and interactions of tectonic plates, which is fundamental to processes such as continental drift, earthquakes, and volcanic activity. Unlike the rigid lithosphere above it, the asthenosphere is less viscous, enabling the plates to glide over it. This distinction in physical properties is crucial for understanding plate tectonics and the dynamic nature of the Earth's interior.

3. What is the significance of latitude in geography?

A. It determines time zones.

B. It indicates temperature zones.

C. It measures distance north and south of the Earth's equator.

D. It relates to ocean currents.

Latitude holds significant importance in geography, particularly in how it represents the distance from the Earth's equator, measured in degrees. The equator is designated as 0 degrees latitude, with values increasing to 90 degrees at the poles. This system helps in mapping the Earth and significantly influences various characteristics of regions. Understanding latitude is critical for various purposes. It aids in navigation and in defining geographical boundaries. Additionally, latitude affects climate and weather patterns, as areas closer to the equator typically experience warmer temperatures due to direct sunlight throughout the year, while regions located at higher latitudes can have cooler climates. Consequently, latitude plays a foundational role in the study of geography as it organizes the Earth's surface. The other options touch on related concepts but are not as directly tied to the core definition of latitude. While latitude can influence time zones and temperature zones and can have indirect relationships with ocean currents, its primary role is in measuring distance north and south of the equator, which is fundamental to understanding geographical positioning.

4. What does GIS stand for in the context of geographical information?

A. Geographical Information System

B. Global Information System

C. Geometric Information System

D. Geographical Index System

The term GIS stands for Geographical Information System. This system is crucial in the field of geography and Earth science as it enables the organization, analysis, and visualization of geographical data. A GIS integrates hardware, software, and data for capturing, managing, and presenting all forms of geographically referenced information. By utilizing layers of data, GIS helps in understanding spatial relationships and patterns, making it an invaluable tool for urban planning, resource management, environmental monitoring, and many other applications. The focus of a Geographical Information System is its ability to link various data types to a specific location on the Earth's surface, allowing for comprehensive analyses that inform decision-making processes across multiple disciplines. This capability distinguishes GIS from other systems that do not incorporate geographical context in their analyses.

5. Which term describes the water portion of Earth?

A. Lithosphere

B. Geosphere

C. Hydrosphere

D. Atmosphere

The term that describes the water portion of Earth is "Hydrosphere." This concept encompasses all forms of water found on the planet, including oceans, rivers, lakes, glaciers, and even groundwater. The hydrosphere plays a critical role in the Earth's systems, influencing weather, climate, and living organisms. It interacts dynamically with the atmosphere (the layer of gases surrounding the Earth), the lithosphere (the solid outer part of the Earth), and the geosphere (which refers to the Earth's interior and landforms). Understanding the hydrosphere is vital for studying water cycles, ecosystems, and environmental sciences.

6. What does the hydroplate theory describe?

A. Formation of minerals

B. Subduction of tectonic plates

C. Separation of granitic crust across subcrustal water

D. Composition of the Earth's core

The hydroplate theory provides an explanation for the separation of granitic crust due to the presence of water trapped beneath the Earth's surface. This theory suggests that water was once stored beneath the crust in vast quantities, and as tectonic processes occurred, this water exerted pressure on the crustal plates. The separation of granitic crust is attributed to this high-pressure water, which played a significant role in the structural dynamics of the Earth's lithosphere. Proponents of the hydroplate theory argue that the sudden release of this subsurface water could lead to catastrophic geological changes, including the potential for flooding events and reformation of landmasses. This concept emphasizes the importance of water not just as a surface-level feature but as a significant factor influencing geological movements and crust formation. In contrast, the other options mentioned do not relate directly to the core principle of hydroplate theory. The formation of minerals pertains more to geological processes involving temperature and chemical reactions rather than the influence of subsurface water. The subduction of tectonic plates involves the movement of one tectonic plate beneath another, which doesn't specifically address the water interaction proposed by the hydroplate theory. Lastly, the composition of the Earth's core deals with the materials and processes occurring deep within the Earth, separate from the

7. What is the central body of the Solar System?

A. Earth

B. Mars

C. Moon

D. Sun

The Sun is the central body of the Solar System due to its massive size and gravitational influence. It contains about 99.86% of the Solar System's total mass, making it the most significant celestial body. The Sun's gravitational pull is what keeps the planets, including Earth and Mars, in orbit around it. In contrast, Earth, Mars, and the Moon do not have the same gravitational dominance; they are all bodies that orbit the Sun. Earth and Mars are planets, while the Moon is a natural satellite of Earth. The existence of the Sun at the center facilitates the structure and dynamics of the entire Solar System, including the orbits of the planets, moons, asteroids, and comets. Its energy is essential for life on Earth and influences the climate and atmospheres of other planets as well.

8. Which term describes igneous rock that cools and solidifies beneath the earth's surface, also known as intrusive rock?

A. Volcanic rock

B. Plutonic rock

C. Basaltic rock

D. Rhyolitic rock

The term that describes igneous rock that cools and solidifies beneath the Earth's surface is "plutonic rock." This type of rock forms from the slow cooling of magma, allowing large crystals to develop within the solidified rock. Because it solidifies underground, it is classified as intrusive. Plutonic rocks, such as granite, are typically coarse-grained due to this slow cooling process. In contrast, volcanic rock refers to igneous rock that forms from the rapid cooling of lava at or near the surface, leading to a different texture and mineral composition. Basaltic rock specifically refers to a type of volcanic rock that is rich in iron and magnesium, typically found in oceanic crusts and formed from lava flows. Rhyolitic rock, on the other hand, is a type of volcanic rock that is high in silica and has a glassy appearance, resulting from lava that cools quickly at the surface. Understanding these distinctions highlights why plutonic rock is the correct answer to the question.

9. What type of rock is formed from the eroded products of preexisting rocks or through mineral precipitates?

A. Igneous Rock

B. Metamorphic Rock

C. Sedimentary Rock

D. Volcanic Rock

Sedimentary rock is formed from the accumulation and compaction of sediments, which can consist of eroded materials from preexisting rocks. These materials may be derived from weathering processes that break down rocks into smaller particles, which are then transported and deposited in various environments such as rivers, lakes, or oceans. Over time, these sediments undergo lithification, solidifying into sedimentary rocks. Additionally, sedimentary rocks can also form through mineral precipitation. This occurs when dissolved minerals in water precipitate out and accumulate, often in sedimentary environments like salty lakes or ocean floors. The two primary processes—compaction of eroded sediments and precipitation of minerals—are fundamental in the formation of sedimentary rocks, distinguishing them from igneous rocks, which form from cooled magma, and metamorphic rocks, which arise from the alteration of existing rocks under heat and pressure. Volcanic rocks, a subset of igneous rocks formed from lava that erupts and cools on the Earth's surface, do not involve the processes associated with sedimentary rock formation. Thus, sedimentary rock is the accurate choice for the question posed.

10. Which of the following describes the concept of contour lines?

A. Lines of constant elevation on a map

B. Paths taken by rivers

C. Lines representing human boundaries

D. Lines marking transportation routes

Contour lines are defined as lines on a map that connect points of equal elevation above a given level, typically sea level. These lines provide a visual representation of the terrain's shape and slope. When contour lines are close together, they indicate a steep gradient, while wider spacing denotes gentler slopes. By analyzing the arrangement of contour lines, one can understand the topography of the landscape, including hills, valleys, and flat areas. The other options do not accurately describe contour lines. Paths taken by rivers relate to waterways, not elevation. Human boundaries pertain to jurisdictional or political lines, lacking any reference to elevation. Transportation routes represent pathways for travel and transport, which do not convey information about elevation or landform shapes. This distinction reinforces the specific role of contour lines in map interpretation and physical geography.