CUET PG 2026 Geology Question Paper with Solutions

Time Allowed :1 Hour 30 Minutes	Maximum Marks :300	Total Questions :75

General Instructions

Read the following instructions very carefully and strictly follow them:

- The Question Paper consists of 75 Multiple Choice Questions (MCQs).
- Total marks for the exam is 300.
- The total duration is 90 minutes; a, timer on the screen will display the remaining time, and the exam will automatically submit when the time reaches zero.
- For every correct answer, 4 marks (+4) will be awarded to the candidate, and a 1 mark (-1) will be deducted for every incorrect answer.
- Question papers are available in both English and Hindi.

1. Which of the following minerals exhibits the highest hardness on the Mohs scale?

(A) Talc
(B) Gypsum
(C) Quartz
(D) Diamond

Correct Answer: (D) Diamond

Solution:

The Mohs scale of hardness is a relative scale that ranks minerals based on their ability to scratch one another. It assigns a number from 1 (softest) to 10 (hardest) to ten reference minerals. A mineral with a higher number can scratch any mineral with an equal or lower number.

Step 1: Understanding the Question:
The question asks to identify which of the four given minerals is the hardest, according to the Mohs scale.

Step 2: Detailed Explanation:
We need to compare the hardness values of the minerals listed:

- **Talc:** This is the softest mineral on the scale, with a hardness of 1.
- **Gypsum:** This mineral has a hardness of 2, meaning it can scratch talc.

- **Quartz:** This is a relatively hard mineral with a hardness of 7. It can scratch most common minerals.

- **Diamond:** This is the hardest known natural mineral and is at the top of the Mohs scale with a hardness of 10.

By comparing these values, it is clear that Diamond has the highest hardness.

Step 3: Final Answer:
Therefore, Diamond exhibits the highest hardness on the Mohs scale.

Quick Tip

To remember the extremes of the Mohs scale, think:
Talc is as soft as powder (Hardness 1).
Diamond is the ultimate cutting material (Hardness 10).

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2. The "Discontinuity" that separates the Earth's crust from the mantle is known as?

(A) Gutenberg Discontinuity
(B) Mohorovičić Discontinuity
(C) Lehmann Discontinuity
(D) Conrad Discontinuity

Correct Answer: (B) Mohorovičić Discontinuity

Solution:

The Earth's interior is composed of several distinct layers. The boundaries between these layers are known as discontinuities, which are identified by abrupt changes in the velocity of seismic waves. These changes are due to differences in the density and composition of the rock on either side of the boundary.

Step 1: Understanding the Question:
The question asks to name the specific discontinuity that marks the boundary between the Earth's crust and the underlying mantle.

Step 2: Detailed Explanation:
Let's analyze the discontinuities given in the options:

- **Gutenberg Discontinuity:** This separates the mantle from the outer core.

- **Mohorovičić Discontinuity (Moho):** This is the boundary between the crust and the mantle. It is characterized by a sharp increase in the velocity of seismic P-waves.

- **Lehmann Discontinuity:** This separates the liquid outer core from the solid inner core.

- **Conrad Discontinuity:** This is a less distinct boundary found within the continental crust, separating the upper (felsic) crust from the lower (mafic) crust.

The boundary between the crust and the mantle is correctly identified as the Mohorovičić Discontinuity.

Step 3: Final Answer:
Therefore, the Mohorovičić Discontinuity is the correct answer.

> Quick Tip
>
> Remember the main layers and their boundaries from the surface down:
> Crust → **Moho** → Mantle → **Gutenberg** → Outer Core → **Lehmann** → Inner Core.
> The Moho is the shallowest major discontinuity.

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3. In which type of plate boundary is new oceanic crust typically created?

(A) Convergent boundary
(B) Divergent boundary
(C) Transform boundary
(D) Conservative boundary

Correct Answer: (B) Divergent boundary

Solution:

Plate tectonics theory describes the movement of the Earth's lithospheric plates. The interactions at the boundaries between these plates result in major geological phenomena. There are three primary types of plate boundaries.

Step 1: Understanding the Question:
The question asks to identify the plate boundary where new oceanic crust is formed.

Step 2: Detailed Explanation:
Let's examine the processes at each type of boundary:

- **Convergent boundary:** Plates move towards each other. This leads to the destruction of crust (subduction) or the formation of mountains.

- **Divergent boundary:** Plates move apart from each other. As they separate, magma from the mantle rises to the surface, cools, and solidifies to create new oceanic crust. This process is known as seafloor spreading and occurs at mid-ocean ridges.

- **Transform boundary:** Plates slide horizontally past each other. Crust is neither created nor destroyed. This is also known as a conservative boundary.

The creation of new crust is the defining feature of a divergent boundary.

Step 3: Final Answer:
Thus, new oceanic crust is created at a divergent boundary.

Quick Tip

Use simple associations to remember the boundary types:
Divergent = Divide → new crust is created.
Convergent = Collide → crust is destroyed.
Transform = Slide → crust is conserved.

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4. Which silicate structure is characterized by a single chain of SiO_4 tetrahedra?

(A) Nesosilicates
(B) Inosilicates (single chain)
(C) Phyllosilicates
(D) Tectosilicates

Correct Answer: (B) Inosilicates (single chain)

Solution:

Silicate minerals, which form the majority of the Earth's crust, are classified based on the arrangement and polymerization of the silica tetrahedron, which consists of one silicon atom bonded to four oxygen atoms (SiO_4).

Step 1: Understanding the Question:
The question asks to identify the classification for silicate minerals that are built from single chains of linked SiO_4 tetrahedra.

Step 2: Detailed Explanation:
Let's review the main silicate structures:

- **Nesosilicates:** Have isolated SiO_4 tetrahedra that are not linked to each other (e.g., Olivine).

- **Inosilicates:** Tetrahedra are linked to form chains. This group is subdivided into:

  - **Single-chain silicates**, where each tetrahedron shares two oxygen atoms (e.g., Pyroxenes).

  - **Double-chain silicates**, where half the tetrahedra share two oxygens and half share three (e.g., Amphiboles).

- **Phyllosilicates:** Tetrahedra are linked to form continuous two-dimensional sheets, with each tetrahedron sharing three oxygen atoms (e.g., Micas).

- **Tectosilicates:** All four oxygen atoms in each tetrahedron are shared, forming a three-dimensional framework (e.g., Quartz, Feldspars).

The structure described in the question, a single chain, directly corresponds to the single-chain inosilicate group.

Step 3: Final Answer:
Therefore, the correct classification is Inosilicates (single chain).

Quick Tip

Remember the dimensionality of the structures:
Neso = 0D (isolated points).
Ino = 1D (chains).
Phyllo = 2D (sheets).
Tecto = 3D (framework).

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5. The primary ore mineral of Aluminium is known as?

(A) Hematite
(B) Bauxite
(C) Galena
(D) Chalcopyrite

Correct Answer: (B) Bauxite

Solution:

An ore is a rock or mineral from which a metal or valuable mineral can be extracted profitably. Each major industrial metal is primarily sourced from one or more specific ore minerals.

Step 1: Understanding the Question:
The question asks to identify the principal ore from which Aluminium is extracted.

Step 2: Detailed Explanation:
Let's analyze the options to see which metal they are an ore of:

- **Hematite** (Fe_2O_3): This is the most important ore of **Iron**.
- **Bauxite:** This is not a single mineral but a sedimentary rock that is the world's main source of **Aluminium**. It is rich in aluminium hydroxide minerals like gibbsite, boehmite, and diaspore.
- **Galena** (PbS): This is the primary ore of **Lead**.
- **Chalcopyrite** ($CuFeS_2$): This is the most important ore of **Copper**.

Based on this analysis, Bauxite is the correct answer for Aluminium.

Step 3: Final Answer:
The primary ore mineral of Aluminium is Bauxite.

Quick Tip

For exams, it's crucial to match key metals with their primary ores:
Aluminium → **Bauxite**
Iron → **Hematite** / Magnetite
Lead → **Galena**
Copper → **Chalcopyrite**

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6. Which geological era is often referred to as the "Age of Reptiles"?

(A) Paleozoic Era
(B) Mesozoic Era
(C) Cenozoic Era
(D) Precambrian

Correct Answer: (B) Mesozoic Era

Solution:

The geologic time scale divides Earth's history into units of time, such as eons and eras. Each era is characterized by the dominant forms of life that existed during that period.

Step 1: Understanding the Question:
The question asks to identify the geological era that is nicknamed the "Age of Reptiles" due to the dominance of this group of animals.

Step 2: Detailed Explanation:
Let's review the nicknames for the major eras of the Phanerozoic Eon:

- **Paleozoic Era** ("Age of Ancient Life"): Characterized by the rise of fish, amphibians, and invertebrates like trilobites.
- **Mesozoic Era** ("Age of Reptiles"): This era, which includes the Triassic, Jurassic, and Cretaceous periods, was dominated by reptiles on land, in the sea, and in the air, most notably the dinosaurs.
- **Cenozoic Era** ("Age of Mammals"): Following the extinction of the dinosaurs, mammals diversified and became the dominant large land animals.
- **Precambrian:** This covers the vast expanse of time before the Paleozoic Era and was dominated by simple, single-celled organisms.

The dominance of dinosaurs and other large reptiles makes the Mesozoic Era the "Age of Reptiles".

Step 3: Final Answer:
The Mesozoic Era is correctly referred to as the "Age of Reptiles".

Quick Tip

Remember the eras by their dominant life forms:
Paleozoic → **P**rimitive Life (Fish, Trilobites)
Mesozoic → **M**onstrous Reptiles (Dinosaurs)
Cenozoic → **C**urrent Life (Mammals)

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7. In Bowen's Reaction Series, which mineral is the first to crystallize in the discontinuous series?

(A) Quartz
(B) Muscovite

(C) Olivine
(D) Biotite

Correct Answer: (C) Olivine

Solution:

Bowen's Reaction Series describes the sequence in which different silicate minerals crystallize from a cooling magma. It consists of two branches: a discontinuous series of ferromagnesian minerals and a continuous series of plagioclase feldspars. Minerals that crystallize first do so at the highest temperatures.

Step 1: Understanding the Question:
The question asks to identify the first mineral to form in the discontinuous branch of Bowen's Reaction Series, which corresponds to the mineral that crystallizes at the highest temperature.

Step 2: Detailed Explanation:
The discontinuous series describes how, as magma cools, one mineral is formed, and then as the temperature drops further, it reacts with the remaining melt to form the next mineral in the sequence. The order from highest temperature to lowest temperature is:

$$\text{Olivine} \rightarrow \text{Pyroxene} \rightarrow \text{Amphibole} \rightarrow \text{Biotite Mica}$$

The other options, Muscovite and Quartz, crystallize at even lower temperatures, after Biotite. Since Olivine is at the beginning of this sequence, it crystallizes at the highest temperature.

Step 3: Final Answer:
Therefore, Olivine is the first mineral to crystallize in the discontinuous series.

Quick Tip

Use the mnemonic "**O**ld **P**eople **A**re **B**oring" to remember the order of the discontinuous series:
Olivine → **P**yroxene → **A**mphibole → **B**iotite.
The first word, Olivine, is the first to crystallize.

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8. What is the specific name for a tabular igneous intrusion that runs parallel to the bedding planes of the country rock?

(A) Dyke
(B) Sill
(C) Laccolith
(D) Batholith

Correct Answer: (B) Sill

Solution:

Igneous intrusions, or plutons, are bodies of magma that cool and solidify beneath the Earth's surface. They are classified based on their size, shape, and relationship to the surrounding 'country rock' they intrude into. A key distinction is whether they are concordant (parallel to existing layers) or discordant (cutting across existing layers).

Step 1: Understanding the Question:
The question is asking for the name of a sheet-like (tabular) igneous body that has been injected between, and parallel to, the layers of the surrounding rock.

Step 2: Detailed Explanation:
Let's define the given terms:

- **Dyke:** A tabular intrusion that cuts **across** the bedding planes of the country rock (discordant).
- **Sill:** A tabular intrusion that runs **parallel** to the bedding planes of the country rock (concordant).
- **Laccolith:** A dome-shaped (or mushroom-shaped) concordant intrusion that has arched the overlying rock layers upwards.
- **Batholith:** A very large, irregularly shaped, and deep-seated discordant intrusion.

The description "tabular" and "parallel to the bedding planes" perfectly matches the definition of a Sill.

Step 3: Final Answer:
The correct name for this type of intrusion is a Sill.

Quick Tip

A simple way to remember the difference:
A **Sill** is like a window **sill**, which is horizontal and parallel to the floor.
A **Dyke** cuts vertically or at an angle, like a wall or fence.

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9. Which type of fault occurs when the hanging wall moves downward relative to the footwall?

(A) Reverse fault
(B) Normal fault

(C) Strike-slip fault
(D) Thrust fault

Correct Answer: (B) Normal fault

Solution:

Faults are fractures in the Earth's crust where there has been significant displacement. They are classified based on the direction of relative movement between the two blocks of rock on either side of the fault plane. These blocks are called the hanging wall (the block above the fault plane) and the footwall (the block below the fault plane).

Step 1: Understanding the Question:
The question describes a specific type of fault movement—the hanging wall moving down with respect to the footwall—and asks for the name of this fault type.

Step 2: Detailed Explanation:
Let's examine the different types of faults based on movement:

- **Normal fault:** The hanging wall moves **downward** relative to the footwall. This is caused by tensional forces (stretching or pulling the crust apart).
- **Reverse fault:** The hanging wall moves **upward** relative to the footwall. This is caused by compressional forces (squeezing the crust).
- **Thrust fault:** This is a special type of reverse fault with a low-angle fault plane (typically less than 45 degrees).
- **Strike-slip fault:** The movement is horizontal (sideways), with little to no vertical motion.

The movement described in the question is the defining characteristic of a normal fault.

Step 3: Final Answer:
A fault where the hanging wall moves downward relative to the footwall is a Normal fault.

Quick Tip

Remember the movement with this simple analogy:
In a **Normal** fault, the hanging wall slides down, as you would expect due to gravity.
In a **Reverse** fault, the movement is the 'reverse' of what gravity would do—the hanging wall is pushed up.

10. The famous "Gondwana Supergroup" in India is primarily known for its deposits of?

(A) Petroleum
(B) Coal
(C) Limestone
(D) Iron ore

Correct Answer: (B) Coal

Solution:

The Gondwana Supergroup is a sequence of late Paleozoic to early Mesozoic sedimentary rocks found in India and other southern hemisphere continents that were once part of the supercontinent Gondwana. These rocks provide significant economic resources.

Step 1: Understanding the Question:
The question asks to identify the primary economic resource for which the Gondwana Supergroup in India is famous.

Step 2: Detailed Explanation:
The Gondwana rocks were deposited in continental rift valleys and basins. The warm, humid climate during their deposition supported vast swamps and forests. The accumulation of plant matter in these swamps, followed by burial and compaction, led to the formation of extensive coal seams.

- The Gondwana formations host over 98% of India's **coal** reserves.
- Petroleum and limestone are typically formed in marine environments, which is not characteristic of the Gondwana sequence.
- Major iron ore deposits in India are typically found in much older Precambrian rocks, such as the Banded Iron Formations (BIF).

Therefore, the Gondwana Supergroup's primary significance lies in its vast coal deposits.

Step 3: Final Answer:
The Gondwana Supergroup is primarily known for its deposits of Coal.

Quick Tip

Associate **Gondwana** with ancient, swampy forests.
Ancient forests + Burial + Time = **Coal**.
This simple connection helps recall the main resource of these rock formations in India.

11. Which seismic wave is the fastest and can travel through both solid and liquid mediums?

(A) Primary (P) waves
(B) Secondary (S) waves
(C) Love waves
(D) Rayleigh waves

Correct Answer: (A) Primary (P) waves

Solution:

Seismic waves are waves of energy that travel through the Earth's layers, typically as a result of an earthquake. They are broadly classified into body waves (which travel through the Earth's interior) and surface waves (which travel along the surface).

Step 1: Understanding the Question:
The question asks to identify the seismic wave that has two specific properties: it is the fastest, and it can propagate through both solid and liquid materials.

Step 2: Detailed Explanation:
Let's analyze the properties of the different seismic waves:

- **Primary (P) waves:** These are compressional body waves, meaning the particle motion is in the same direction as wave propagation. They are the **fastest** of all seismic waves and can travel through solids, liquids, and gases.

- **Secondary (S) waves:** These are shear body waves, with particle motion perpendicular to the direction of wave propagation. They are slower than P-waves and can **only travel through solids**, as liquids cannot support shear stress.

- **Love waves and Rayleigh waves:** These are surface waves. They are slower than both P-waves and S-waves and are confined to the surface.

Only P-waves meet both criteria of being the fastest and being able to travel through liquids.

Step 3: Final Answer:
Primary (P) waves are the fastest seismic waves and can travel through both solid and liquid mediums.

Quick Tip

Use the letters 'P' and 'S' to remember their properties:
P-wave: **P**rimary (arrives first), **P**ressure (compressional), **P**asses through all media.
S-wave: **S**econdary (arrives second), **S**hear (side-to-side motion), **S**tops at liquids (solids only).

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12. An unconformity where sedimentary layers are deposited over eroded igneous or metamorphic rocks is called a?

(A) Angular unconformity
(B) Disconformity
(C) Nonconformity
(D) Paraconformity

Correct Answer: (C) Nonconformity

Solution:

An unconformity is a surface that represents a gap in the geologic record, typically caused by a period of erosion or non-deposition. Geologists classify unconformities into different types based on the relationship and orientation of the rock layers above and below the gap.

Step 1: Understanding the Question:
The question asks for the specific name of an unconformity that separates younger sedimentary rocks from older, underlying crystalline rocks (igneous or metamorphic).

Step 2: Detailed Explanation:
Let's define the types of unconformities listed:

- **Angular unconformity:** An erosional surface on tilted or folded older sedimentary rocks, which is then overlain by younger, more horizontal sedimentary layers.

- **Disconformity:** An erosional surface between two parallel layers of sedimentary rock, indicating a period of erosion without tilting.

- **Nonconformity:** An erosional surface where younger sedimentary rocks rest on top of older, eroded igneous or metamorphic rocks. This represents a significant amount of uplift and erosion of the underlying crystalline rock before the new sediment was deposited.

- **Paraconformity:** A surface where the layers are parallel and there is no visible erosional surface, but a time gap is known to exist based on fossil evidence.

The scenario described—sedimentary layers over igneous/metamorphic rocks—is the definition of a nonconformity.

Step 3: Final Answer:
The correct term for this type of unconformity is a Nonconformity.

Quick Tip

Remember the names by the rock types involved:
Nonconformity separates sedimentary rocks from **non**-sedimentary (crystalline) rocks.
Angular unconformity has different **angles** between the layers.
Disconformity involves parallel layers that are '**dis**continuous' in time.

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13. What is the most abundant element in the Earth's crust by weight percentage?

(A) Silicon
(B) Oxygen
(C) Aluminium
(D) Iron

Correct Answer: (B) Oxygen

Solution:

The Earth's crust is the outermost solid shell of the planet. While it contains many elements, a few make up the vast majority of its mass. The abundance is typically measured as a percentage of the total weight.

Step 1: Understanding the Question:
The question asks to identify the single element that constitutes the largest portion of the Earth's crust by weight.

Step 2: Detailed Explanation:
Let's look at the approximate weight percentages of the most common elements in the Earth's crust:

- **Oxygen (O):** $\sim 46.6\%$
- **Silicon (Si):** $\sim 27.7\%$
- **Aluminium (Al):** $\sim 8.1\%$

- **Iron (Fe):** $\sim 5.0\%$
- **Calcium (Ca):** $\sim 3.6\%$
- **Sodium (Na):** $\sim 2.8\%$
- **Potassium (K):** $\sim 2.6\%$
- **Magnesium (Mg):** $\sim 2.1\%$

Oxygen is by far the most abundant element. This is because it is the primary component of silicate minerals (SiO_4), which are the building blocks of most crustal rocks, and it also forms oxides with other elements.

Step 3: Final Answer:
By weight percentage, Oxygen is the most abundant element in the Earth's crust.

Quick Tip

Remember the top two elements make up almost 75% of the crust: **Oxygen** and **Silicon**.
A mnemonic for the top 8 elements in order is: "**O**nly **S**trong **A**thletes **I**n **C**ollege **S**tudy **P**ast **M**idnight". (O, Si, Al, Fe, Ca, Na, K, Mg).

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14. Which sedimentary structure is used to determine the paleo-current direction?

(A) Ripple marks
(B) Mud cracks
(C) Graded bedding
(D) Cross-bedding

Correct Answer: (D) Cross-bedding

Solution:

Sedimentary structures are features within sedimentary rocks that form at the time of deposition. They provide valuable clues about the conditions of the depositional environment, including the direction of water or wind flow, known as the paleo-current.

Step 1: Understanding the Question:
The question asks to identify the sedimentary structure that is a reliable indicator of the direction of the current that deposited the sediments.

Step 2: Detailed Explanation:
Let's evaluate the options as paleo-current indicators:

- **Ripple marks:** Asymmetrical ripple marks have a steep side that faces downstream, so they can indicate current direction. However, symmetrical ripples (formed by waves) are bi-directional and less useful.

- **Mud cracks:** These form when wet mud dries and shrinks. They indicate subaerial exposure but give no information about current direction.

- **Graded bedding:** This refers to a vertical change in grain size within a single bed (coarse at the bottom to fine at the top). It indicates the 'up' direction in the rock sequence but not the horizontal flow direction.

- **Cross-bedding:** This structure consists of inclined layers (foresets) within a larger bed. These foresets form as sediment tumbles down the leeward (down-current) side of a sand dune or ripple. The foresets always dip in the direction the current was flowing, making cross-bedding an excellent and widely used paleo-current indicator.

While asymmetrical ripples can work, cross-bedding is generally considered a more robust and clear indicator.

Step 3: Final Answer:
Cross-bedding is the most commonly used sedimentary structure to determine paleo-current direction.

Quick Tip

Think of how a sand dune is shaped by wind. The sand blows up the gentle slope and avalanches down the steep face. This steep face is preserved as a **cross-bed**, and its dip direction always points where the current was going.

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15. The transformation of Limestone into Marble is an example of which type of metamorphism?

(A) Contact metamorphism
(B) Regional metamorphism
(C) Dynamic metamorphism
(D) Hydrothermal metamorphism

Correct Answer: (A) Contact metamorphism

Solution:

Metamorphism is the process by which a pre-existing rock (the protolith) is altered into a new metamorphic rock by heat, pressure, or chemically active fluids, without melting. The type of metamorphism depends on the dominant geological process at play.

Step 1: Understanding the Question:
The question asks for the specific type of metamorphism that transforms limestone (a sedimentary rock) into marble (a metamorphic rock).

Step 2: Detailed Explanation:
Let's analyze the transformation and the types of metamorphism:

- The transformation from limestone to marble involves the recrystallization of calcite ($CaCO_3$) grains into a coarser, interlocking crystalline texture. This process is driven primarily by an increase in temperature.

- **Contact metamorphism:** This occurs when a body of magma intrudes into cooler surrounding rock. The heat from the magma "bakes" the adjacent rock, causing recrystallization. This is a high-temperature, low-pressure process and is the classic setting for the formation of marble from limestone.

- **Regional metamorphism:** This affects large areas and is associated with mountain building, involving both high temperature and high pressure. While marble can form this way, the simple recrystallization of limestone is most commonly cited as an example of contact metamorphism.

- **Dynamic metamorphism:** This is caused by high shear stress along fault zones, primarily involving mechanical deformation.

- **Hydrothermal metamorphism:** This involves chemical alteration of a rock by hot, ion-rich water.

The primary agent for changing limestone to marble is heat, which is the defining characteristic of contact metamorphism.

Step 3: Final Answer:
The transformation of Limestone into Marble is a classic example of contact metamorphism.

Quick Tip

Think of it like baking:
A hot magma intrusion acts like an oven.
The limestone is the 'dough' that gets put next to the oven.
The heat from the 'contact' with the hot magma 'bakes' the limestone into marble.
