Examrace

Competitive Exams: Geology Glossary A to M

Geology Terminology: A to M

- Accelerograph: A seismograph whose output is proportional to ground acceleration (in comparison to the usual seismograph whose output is proportional to ground velocity). Accelerographs are typically used as instruments designed to record very strong ground motion useful in engineering design; seismographs commonly record off scale in these circumstances. Normally, strong motion instruments do not record unless triggered by strong ground motion.
- Aftershock: One of many earthquakes that often occur during the days to months after some larger earthquake (mainshock) has occurred. Aftershocks occur in the same general region as the mainshock and are believed to be the result of minor readjustments of stress at places in the fault zone.
- Amplitude: The amplitude of a seismic wave is the amount the ground moves as the wave passes by (As an illustration, the amplitude of an ocean wave is one-half the distance between the peak and trough of the wave. The amplitude of a seismic wave can be measured from the signal recorded on a seismogram.).
- Aseismic creep: Movement along a fracture in the Earth that occurs without causing earthquakes. This movement is so slow that it is not recorded by ordinary seismographs.
- Collision: A term sometimes applied to the convergence of two plates in which neither plate subducts. Instead, the edges of the plates crumple and are severely deformed.
- Convection: The motion of a liquid driven by gravity and temperature differences in the material. In the Earth, where pressure and temperature are high, rocks can act like viscous fluids on a time scale of millions of years. Thus, scientists believe that convection is an important process in the rocks that make up the Earth.
- Convergent boundary: The boundary between two plates that approach one another. The convergence may result in subduction if one plate yields by diving deep into the Earth, obduction if one plate is thrust over the other, or collision if the plates simply ram into each other and are deformed.
- Core: The Earth's central region, believed to be composed mostly of iron. The core has a radius of 3, 477 kilometers and is surrounded by the Earth's mantle. At the center of the molten outer core is a solid inner core with a radius of 1, 213 kilometers.

- Earthquake: The release of stored clastic energy caused by sudden fracture and movement of rocks inside the Earth. Part of the energy released produces seismic waves, like P, S, and surface waves, that travel outward in all directions from the point of initial rupture. These waves shake the ground as they pass by. An earthquake is felt if the shaking is strong enough to cause ground accelerations exceeding approximately 1.0 centimeter/second' (Richter, 1958).
- Epicenter: The location on the surface of the Earth directly above the focus, or place where an earthquake originates. An earthquake caused by a fault that offsets features on the Earth's surface may have an epicenter that does not lie on the trace of that fault on the surface. This occurs if the fault plane is not vertical and the earthquake occurs below the Earth's surface.
- Fault: A break in the Earth along which movement occurs. Sudden movement along a fault produces earthquakes. Slow movement produces aseismic creep.
- Fault plane solution: The calculation of the orientation, dip, and slip direction of a fault that produced the ground motion recorded at seismograph stations. Sometimes called a focal mechanism solution.
- Focus: The place in the Earth where rock first breaks or slips at the time of an earthquake; also called the hypocenter. The focus is a single point on the surface of a ruptured fault. During a great earthquake, which might rupture a fault for hundreds of kilometers, one could be standing on the rupturing fault, yet be hundreds of kilometers from the focus.
- Intensity: A measure of the severity of shaking at a particular site. It is usually estimated from descriptions of damage to buildings and terrain. The intensity is often greatest near the earthquake epicenter. Today, the Modified Mercalli Scale is commonly used to rank the intensity from I to XII according to the kind and amount of damage produced. Before 1931 earthquake intensifies were often reported using the Rossi-Forel scale (Richter, 1958).
- Kilometers and other metric units of measure: Conversion formulae: Millimeters x 0.039 = inches, Centimeters x 0.394 = inches, Meters x 3.28 = feet, Kilometers x 0.621 = statute miles, Square kilometers x 0.386 = square miles, Cubic kilometers x 0.240 = cubic miles
- Liquifaction: A process, in which, during ground shaking, some sandy, water-saturated soils can behave like liquids rather than solids.
- Magnitude: A quantity characteristic of the total energy released by an earthquake, as contrasted with intensity, which describes its effects at a particular place. A number of earthquake magnitude scales exist, including local (or Richter) magnitude (ML), body wave magnitude (Mb), surface wave magnitude (Ms), moment magnitude (Mw), and coda magnitude (Mc). As a general rule, an increase of one magnitude unit corresponds to ten times greater ground motion, an increase of two magnitude units corresponds to 100 times greater ground motion, and so on in a logarithmic series. Commonly, earthquakes are recorded with magnitudes from 0 to 8, although occasionally large ones (M = 9) and very small ones (M = -I or-2) are also recorded. Nearby earthquakes with magnitudes as small as

2 to 3 are frequently felt. The actual ground motion for, say, a magnitude 5 earthquake is about 0.04 millimeters at a distance of 100 kilometers from the epicenter; it is 1.1 millimeters at a distance of 10 kilometers from the epicenter.

- Mainshock: The largest in a series of earthquakes occurring closely in time and space. The mainshock may be preceded by foreshocks or followed by aftershocks.
- Mantle: A rock layer, about 2, 894 kilometers thick, between the Earth's crust and core. Like the crust, the upper part of the mantle is relatively brittle. Together, the upper brittle part of the mantle and the crust form tectonic plates.
- Modified Mercalli Intensity Scale: A scale for measuring ground shaking at a site, and whose values range from I (not felt) to XII (extreme damage to buildings and land surfaces).