Hadean Protocrust

Prelims – *Current events of national and international importance| World Geography.*

Mains (GS I) – *Geographical features and their location-changes in critical geographical features (including water-bodies and ice-caps) and in flora and fauna and the effects of such changes.*

Why in News?

New research suggests that Earth's first crust, formed over 4.5 billion years ago.

- The Hadean protocrust is the name for the ***earth's crust***, its outermost layer when it first formed.
- **Hadean Aeon -** The term 'Hadean' denotes the initial geologic aeon of the planet.
- **Conditions of Earth -** During this period, approximately 200 million years after its formation, the Earth's surface was ***partially in a molten state*** and was frequently struck by extraterrestrial rocks.
- The surface was extremely hot and hellish, as numerous volcanoes erupted simultaneously.
- **Formation of Crust -** As the magma ocean began to cool, the initial fragments of the crust started to form.
- However, it remained somewhat unstable, with certain sections breaking away while new areas solidified.
- **Plate Tectonics -** The thicker parts of the crust slowly formed the first continents, which moved like plates on the ***asthenospheric mantle***, a layer of hot, gooey rock going 400 km down.
- These plates began to converge, occasionally sliding past one another or submerging beneath each other.
- Over thousands of years, these tectonic movements have imprinted distinctive chemical signatures in the crust.
- Indeed, researchers have been able to trace the history of plate tectonics by examining these signatures.

Reference

The Hindu | What is the Hadean protocrust?