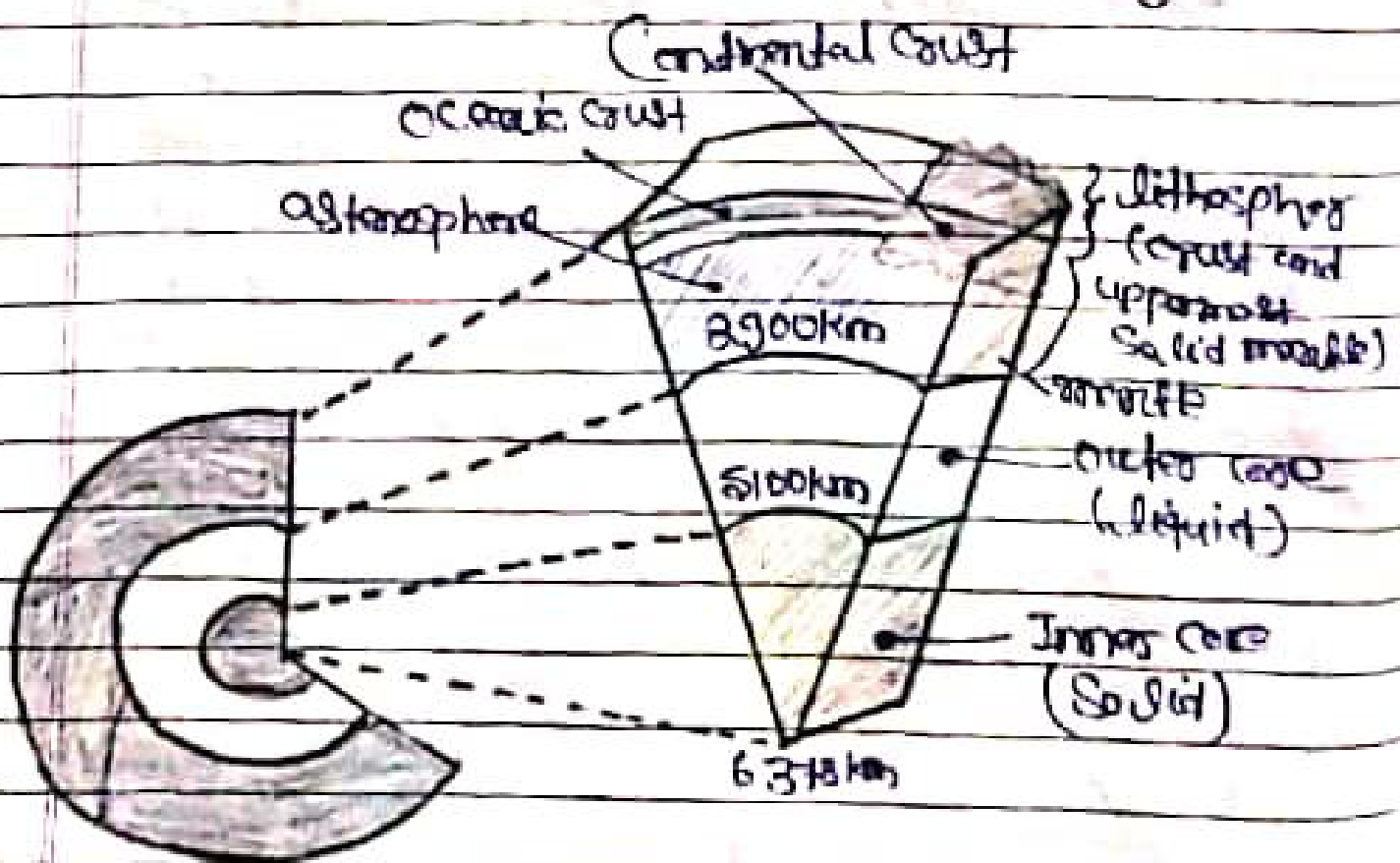


15-05-2020

Dr. Anand Verma, Assistant professor
and head, U.G. Department of
Zoology, Durgam (Buxar), Notes
for B.Sc part 1st, Paper 2(A).

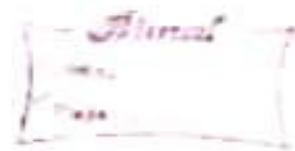
Question: Lithosphere ko classify kraty
hua Sachitra Varnan kraty



A Lithosphere (for 'rocky' and [Litho] for sphere) is the rigid outermost shell of a terrestrial-type planet or natural satellite that is defined by its mechanical properties. On Earth, it is composed of the crust and the portion of the upper mantle that behaves elastically on time scales of thousands of years or greater. The outermost shell of a rocky planet, the crust, is defined on the basis of its chemistry and mineralogy.

The layer under the lithosphere is known as the asthenosphere.

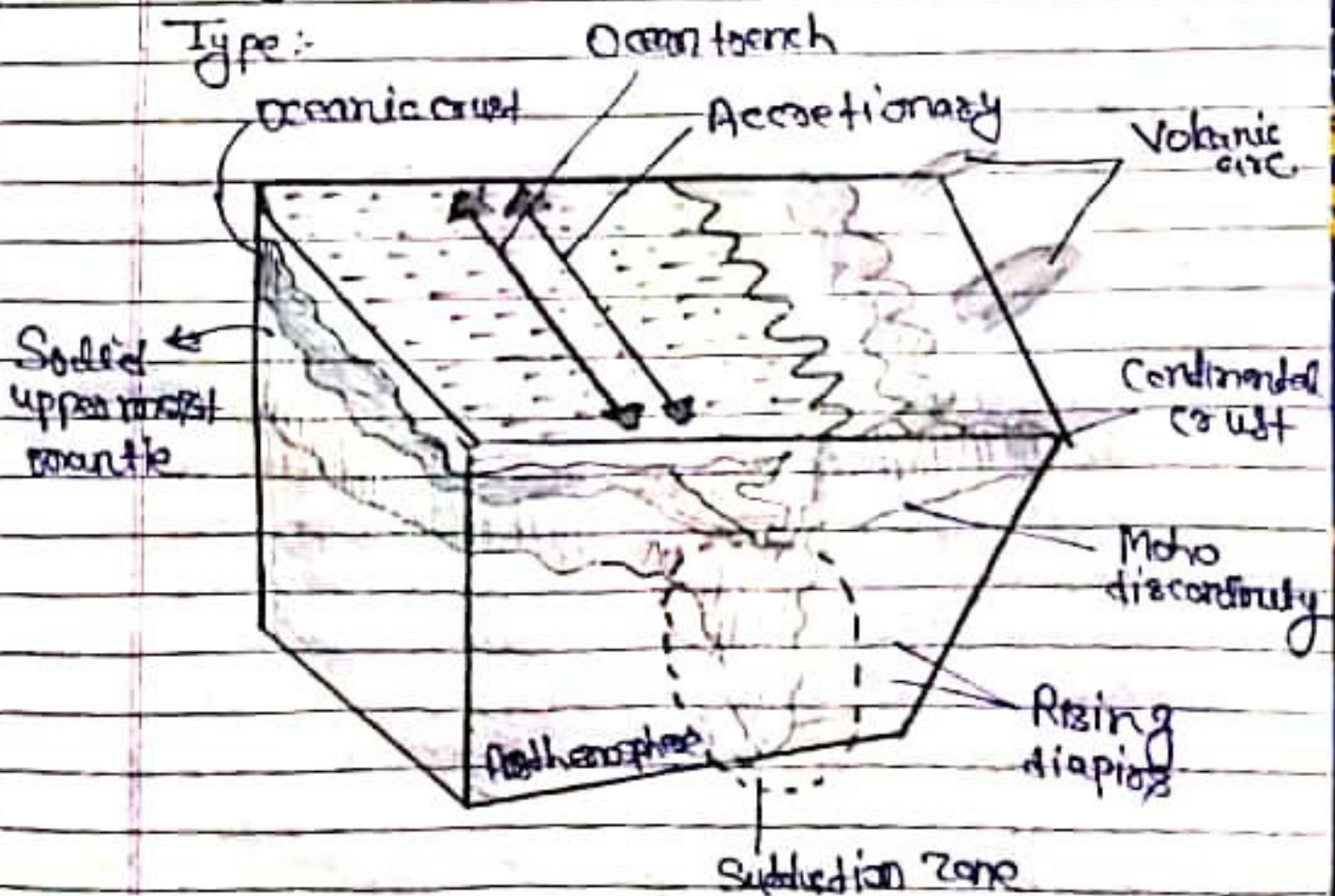
→ History of the Concept:-



The Concept of the lithosphere as Earth's strong outer layer was described by A.E.H. Love in his 1911 monograph "Some problems of Geodynamics" and further developed by Joseph Bezzel, who wrote a series of papers about the concept and introduced the term 'lithosphere'. The concept was based on the presence of size significant gravity anomalies over continental crust, from which he inferred that there must exist a strong, solid upper layer (which he called the lithosphere) above a weaker layer which could flow (which he called the asthenosphere). These ideas were expanded by Reginald Aldworth Daly in 1940 with his seminal work "Strength and

Structure of the Earth" They have been broadly accepted by geologists and geophysicists. These concepts of a strong lithosphere resting on a weak asthenosphere are essential to the theory of plate tectonics.

Type:

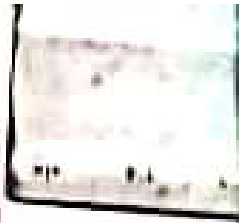


There are two types of lithosphere.

→ Oceanic lithosphere, which is associated with Oceanic Crust and exists in the ocean basins (mean density of about 2.9 grams per cubic centimeter)

→ Continental lithosphere, which is associated with Continental Crust (mean density of about 2.7 grams per cubic centimeter)

The thickness of the lithosphere is considered to be the depth to the Isotherm associated with the transition between brittle and viscous behavior. The temperature at which Olivine begins to deform viscously ($\sim 1000^\circ\text{C}$) is often used to set this Isotherm because Olivine is



generally the weakest mineral in the upper mantle. Oceanic lithosphere is typically about 50-140 km thick (but beneath the mid-ocean ridges is no thicker than the crust). While continental lithosphere has a range in thickness from about 40 km to perhaps 850 km, the upper ~30 to ~50 km of typical continental lithosphere is crust. The mantle part of the lithosphere consists largely of peridotite. The crust is distinguished from the upper mantle by the change in chemical composition that takes place at the Moho discontinuity.