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QUESTION

What three different layers of earth? Relate the (3) different types of plate collisions associated with seismicity, volcanism and mountain building.

ANSWER

A- Planet earth is planet of peculiar characteristics and traits and the only only in our solar system where life persists. Different types of rocks; like, igneous, sedimentary and metamorphic play role in the formation of internal structural and organizational building of earth. Planet earth has three internal layers;

i- Crust

ii- Mantle

iii- Core

i- Crust

The outer part of earth, on which we walk, and is made up of cold and brittle materials is called earth crust. The depth of crust ranges from 5 to 70 km. The crust is mainly composed

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of iron magnesium silicate, sodium, potassium, aluminium and silicate rocks.

Types of earth crust:

Crust is divided into

a- Continental crust

The outermost part of earth that makes up continents and other shallow sea beds is called continental crust. It is rich in silica and thicker than oceanic crust. Its average thickness ranges from 30-70 km.

b- Oceanic crust:

Oceanic crust is the part of earth which makes the ↑ sea underlying part of the crust - also called the oceanic floor. It is mainly composed of iron magnesium silicate and average thickness is 7-10 km.

2- Mantle:

Mantle is the largest part of earth, making 70% of total earth mass and 45% of its radius. It extends its depth to 2900km. It is rich in silicate rocks carrying iron and magnesium in its

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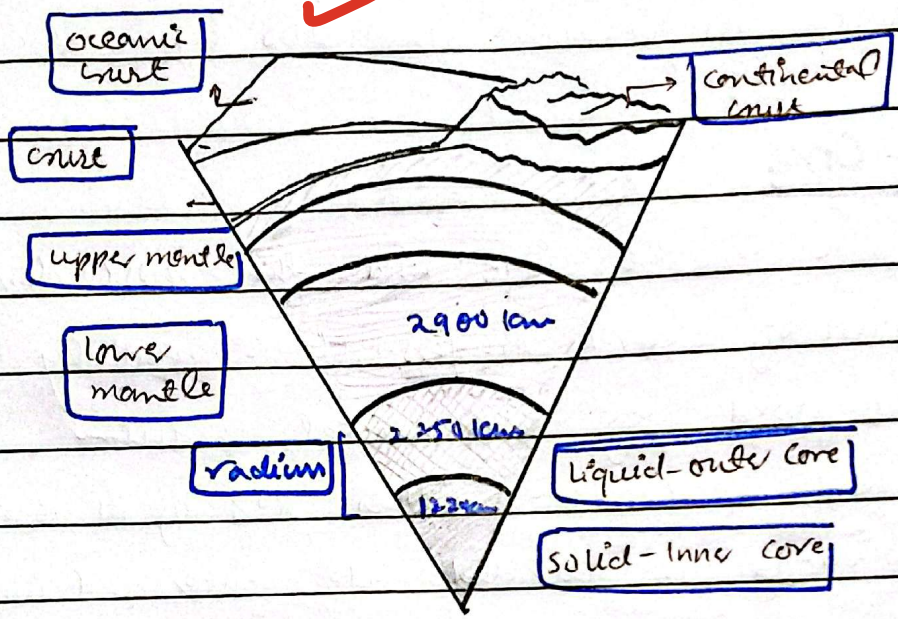
compositional elements. High temperature in mantle causes its solid materials to be ductile in nature. mantle is divided into upper and lower mantle



Earth structure layer by layer

a- upper mantle;

upper mantle is distinguished into two zones asthenosphere and lithosphere. Lithosphere is 100km in thickness and consists of crust and upper part of mantle, while asthenosphere is made up of lower and ductile part of mantle. magma is generated here and its convection results in plate tectonics its depth is 100-250 km.

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ii- lower mantle:

Making a large portion of earth interior its depth ranges from 670 km - 2900 km. lower mantle is chiefly composed of magnesium and iron-bearing silicates. Temperature ranges from 2200-3700 degree celsius.

3- Core

Core is the inner and the most dense part of earth layers. It is mainly composed of iron, nickel, uranium and lead. Iron makes 80% of its total mass. It is divided into outer and inner core.

i- Outer Core

It is the liquid part of core, and it is molten state. Its depth ranges from 2900 km to 5150 km. It comprises 30.8% of earth mass and is mainly composed of molten iron and silicate.

ii- Inner Core

Discovered by Inge Legman in 1929, inner core is the hottest part of the planet earth. It is solid and more denser tha

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outer core. Scientists believe that inner core might be hottest than the surface of the sun.

8- Plate Collisions typology in association with seismicity volcanism and mountain building.

Plates motion in crust form different types of boundaries, like, divergent, convergent and transform boundaries. Convergent boundaries are formed where subduction is located/active and lithosphere is being consumed. Convergent boundaries collide in three different forms, causing seismicity, volcanism and mountain formation. These boundaries are as follows.

i- Oceanic - Oceanic convergence

ii- Continental - continental plate convergence

iii- Continental - Oceanic plate convergence

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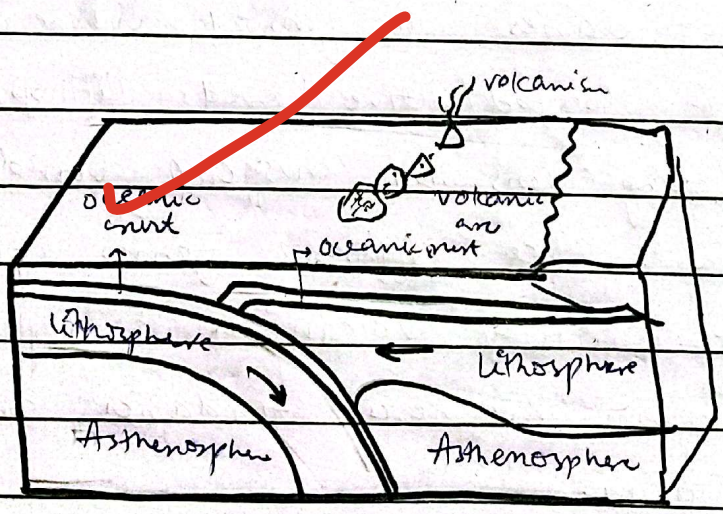
i- Oceanic - Oceanic Plate convergence:

When two oceanic plates collide with each other and one plate subducts or sink underneath other forming an oceanic trench is called oceanic-oceanic plate convergence.

Associated geological features

a- Seismicity:

Strong earthquakes occur at subduction zone and deep in the mantle due to stress buildup and sudden release of it.



b- Volvanism:

The sinking of subduction plate into mantle causes it to melt. The molten rocks and form melting plates to rise toward the surface forming volcanic arc.

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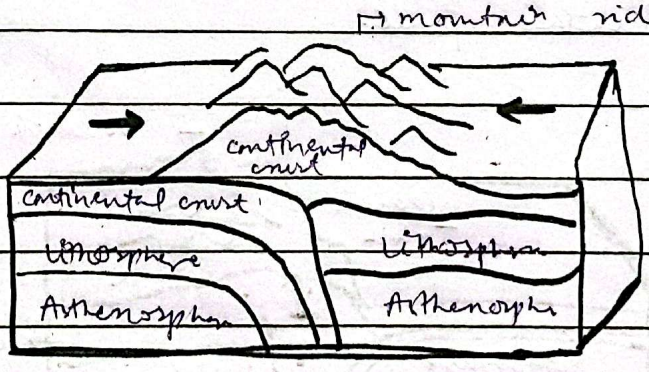
c- **Mountain Formation:**

Growth of volcanic island chain overtime may results in island mountain ranges.

ii- **Continental - Continental plate Convergence:**

The buckling up and compression of two continental plates into each other is called continental-continental plate convergence. In this collision neither of the plates subducts or sink.



Associated geological Activities:

a- **Seismicity:**

Intense shallow-focus earth quakes occur due to crustal compression and faulting.

b- **Volcanism:**

Because of absence of subduction

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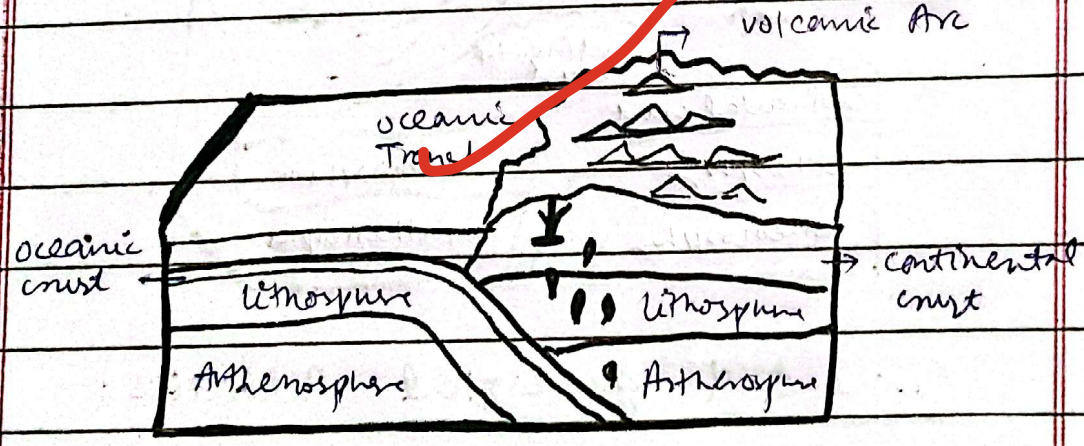
plate little to no volcanism occurs.

c- **Mountain Formation:**

Collision results in complex mountains ranges of great height. Himalayas are made up of the convergence Indian-Australian plate with Eurasian plate.

iii- **Continental Oceanic Plate convergence:**

Collision of continental and oceanic boundaries where oceanic edge subducts under the continental plate.



Associated geological activities:

a- **Seismicity:**

Strong earthquakes occur due to subduction of oceanic crust below the continental edge.

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b- **Volcanism :**

Due to subduction magma generation occurs resulting in continental volcanic arcs.

c- **Mountain formation :**

Thickness and compression of continental crust / volcanic arcs lead to the uplift of mountain ranges. Cascade mountains of America are examples of these activities.

c- Conclusion

Earth is made up of three layers having different structural features. crust of earth is made up of plates which collides with each other resulting in convergance boundaries. These interaction results in different constructive and destructive activities maintaining the dynamic nature of earth.

4.5

good attempt!!\

but if this is a 5 marks gsa qs, then the answer is very lengthy and will affect your time management.