

Optional Geography

Since it is a short note question
try to give good weightage to CRITICISM

Q.1 Write a short note on Wegner's continental drift theory. (250/20)

A.L. Wegner postulated the theory in 1912 and published the same in 1922.

- Aim:**
- To show that climate changes
 - To prove that continents and ocean basin are unstable
 - Continents move hence climate changes.

Observation:

- Some mountains lie West to east eg Alps, Caucasus & Himalayas.
- Some lies North to South eg Rockies & Andes

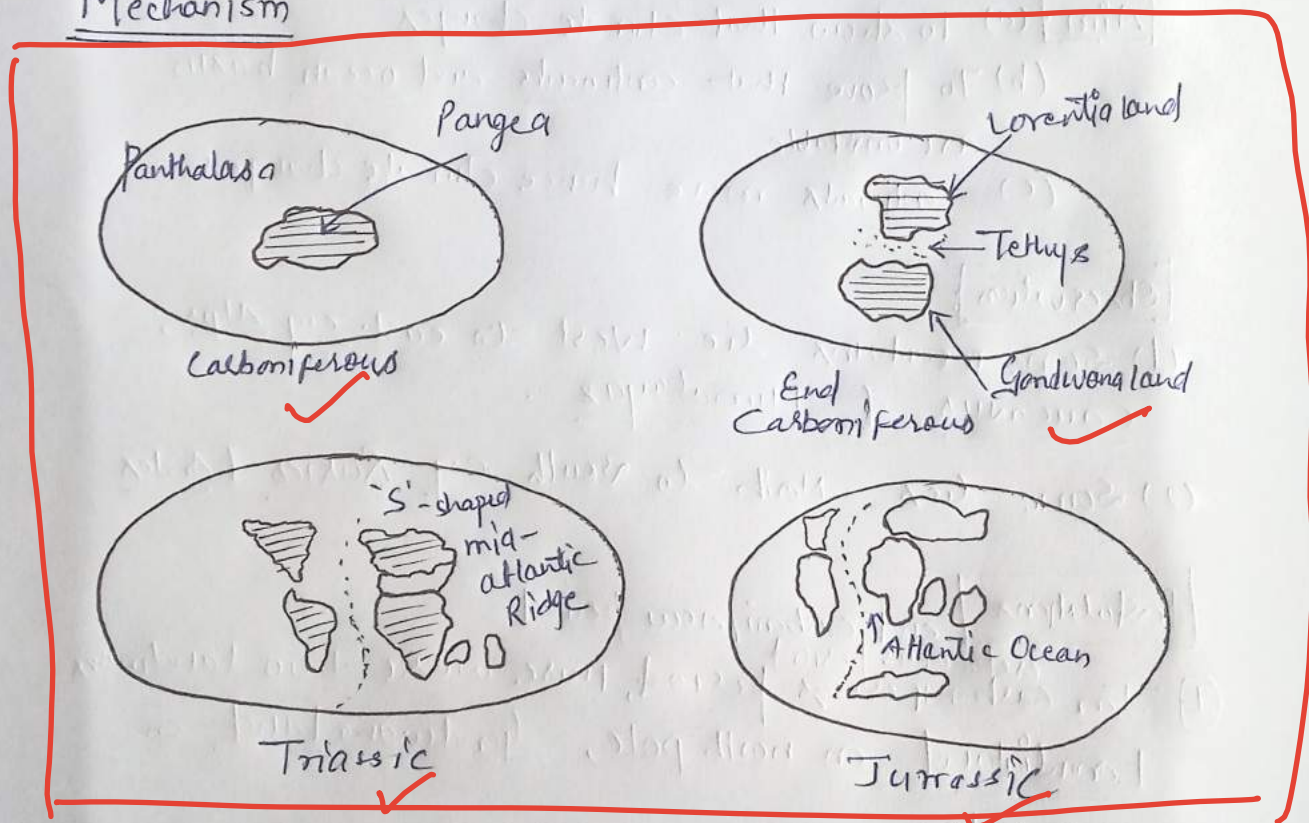
Postulations end carboniferous period

- In ~~Carboniferous period~~ Carboniferous period, there were two landmasses Lorentialand on north pole, Gondwana land on south pole.
- In Carboniferous period, there was super landmass called Pangea.
- Pangea was surrounded by Panthalassa
- Earth has 3 layers: Sial, Simag, Nife;
- Sial floats over Simag.

✓
Evolution of C.D.T in new more comprehensive form as P. T. T.

- ⑥ After the disintegration of Pangea into Lorentia and Gondwana lands in End Carboniferous period, Tethys sea opened

Mechanism



- (1) In Jurassic, Gondwanaland disintegrated, 'S'-shaped mid-Atlantic ridge formed.

⇒ Gondwanaland = South America + Africa + Indo-Australia + Antarctica.

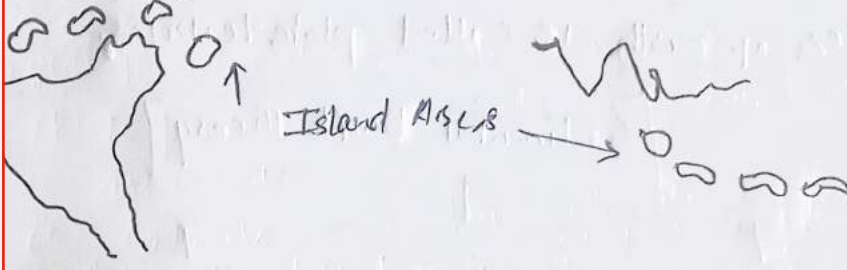
- ② Lorentia land disintegrated into North America + Eurasia.

Force of Drift

- 1. Force of Bouyancy (Westward Force) Equatorward ✓
- 2. ~~Wegenerward~~ Force (Tidal Force) Westward ✓

It is also talk about the gravitation force which later rejected by Plate tectonic theory

- ① Mountain originate due to movement of continents. ✓
- ② Island Arcs e.g. Canadian & Indonesian islands are remnants of continental drift. ✓



Evidences (i) Zig Saw fit e.g. Africa + South America + India ✓
 Hercynian and Caledonian mountains on either side of Atlantic. ✓

glossoptrix vegetation in Antarctica, South America, South Africa etc.

+ Recent satellite imagery of continental shelf imaging at 100m deep validate the zig saw fit of Wegener's theory

- (i) No light on plate tectonics, Geosyncline.
- (ii) Force of drift is not sufficient.
- (iii) Island Arcs are not remnant but volcanic.

+ SIAL not floating over SI-M-A but crust floating over asthenosphere
 introduced for the first time sea-floor spreading. ✓

strong foundation for plate tectonics. ✓
 fossilised Dinosaur eggs in Kenya & Guyarat

completing the theory. ✓

It is also talk about the gravitation force which later rejected by Plate tectonic theory

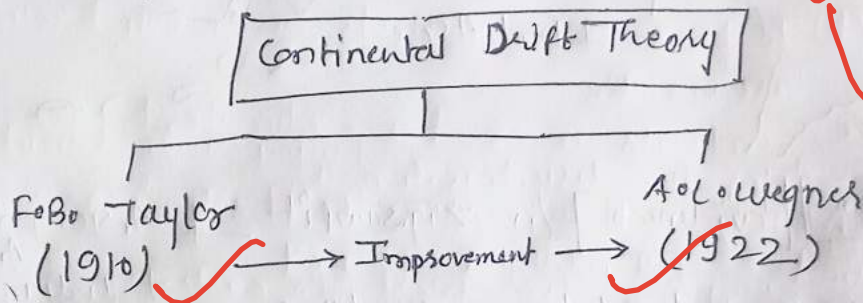
Few suggestions
 1. put diagram in box
 2. In one paragraph also mention about PTT, how CDT helps in its evolution
 3. give more weight to criticism and evaluation part
 4. In conclusion can write : Although Wegener died but CDT alive, and recent technological advancement in GIS, satellite imagery, crustal convective currents have further revive the interest of geographer to review the CDT tenets in modern light.

→ weightage to this part should be more since it is an optional question

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Q.2 Discuss the theory & limitations of continental drift theory and show that how plate tectonics theory is an improvement over it. (25/20)

⇒ The geophysics of vertical and horizontal movement of plates of Earth is called plate tectonics.



not needed

Continental Drift Theory explains ① the origin of tertiary folded mountain

- ② shows that continents & ocean basins are unstable.
- ③ A. L. Wegner → produces evidences to support theory.

④ Explains E.D., volcanic eruption, islands of arcs

⑤ Explains forces responsible for continental movement

Limitations

- ① Continents were drifted several thousand kms to originate mountain while 20-40 miles drift is sufficient.
- ② Force of Drift: is not sufficient.

→ Elaborate it

③ does not clearly define plate tectonics and mountain orogeny.

④ No concept of Geosyncline and convictional currents below crust.

⑤ No exact tracing of geophysics of Earth.

⑥ Concept of SIAL floats over SIMA is not valid.

Basically he failed to explain the formation of continental mountains
Ex. Alps, Himalays

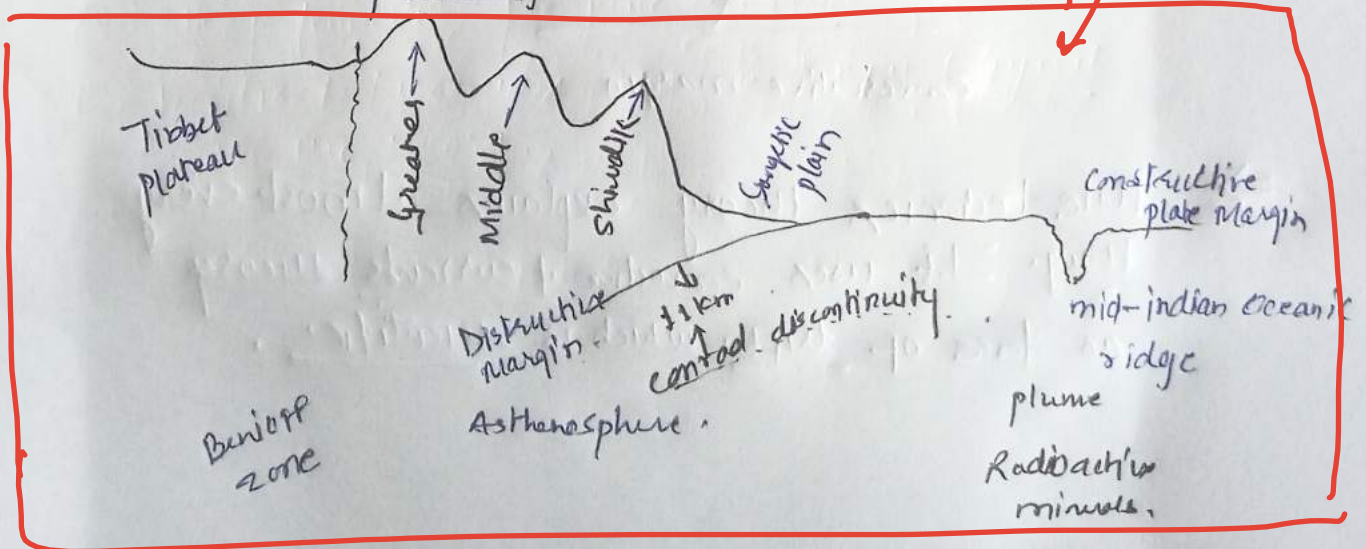
Plate Tectonics

W. J. Morgan (1968)

Henry Hess (1962)

- ① Gave the concept of 20 major + 6 major plates.
- ② Clearly distinguishes between constructive, destructive and conservative land boundary.
- ③ Explains Volcanic Eruption, Earthquake, Sea-floor spreading, etc. & Polar wandering.

Try to elaborate it



The Question is how PTT is an improvement over CDT. This is CORE of the question

- | | CDT | PTT (improvement) |
|---|---|--|
| ① | Continental movement: Tidal forces | Convective current |
| ② | Fold mountains: Continental drift | Convergence of D. Plate and C. Plate |
| ③ | Crustal movement: SI AL float on poles | Crust float over asthenosphere |
| ④ | EQ diff: mag. | Due to Bentoff zone gravitational pull |

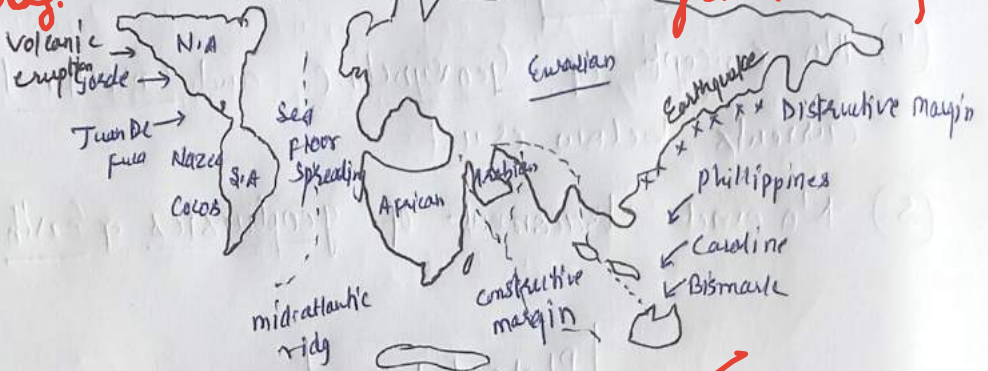


Fig: Plates

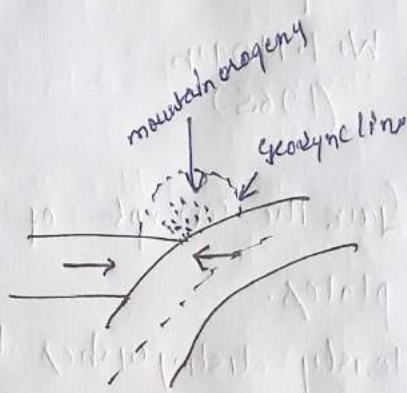
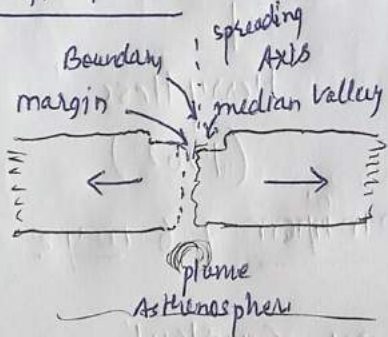
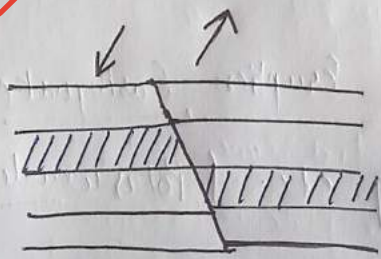


Fig: Constructive Plate Margin

Destructive margin

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Conservative margin

⇒ Plate tectonics theory explains almost every thing. It uses convective currents ~~theory~~ as force of drift, which is scientific.

Conclusion: PTT is more comprehensive, and explains major phenomenon more scientifically.