Question No.
प्रश्न संख्या

UPSC

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सिर्फ अभ्यास के लिए

UPSE CSE 2025

MM: 125

AIR - 267

Time - 90 mins

Test - 06 (GEOGRAPHY)

General Studies
Subjective Assessment

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Date - 23/07/23 Sunday

(1)

Ans) Seismic Discontinuities refers to the zone of transition deeper in the earth's surface representing change of the layer's structural, physical and chemical composition.

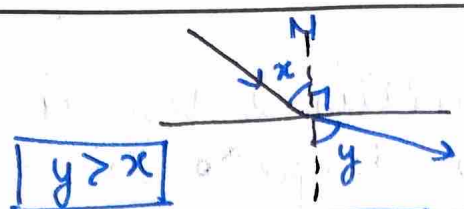
-Seismic Discontinuity

→ the seismic discontinuity are identified & marked by the distinct behavior of the seismic waves in this zone of transition thereby - called DISCONTINUITY.

Seismic Deviation

the distinct nature of the seismic waves can be attributed to the change of
- DENSITY (Δρ)
- STATE OF MATTER
- TEMPERATURE (ΔT)
- PRESSURE (ΔP)

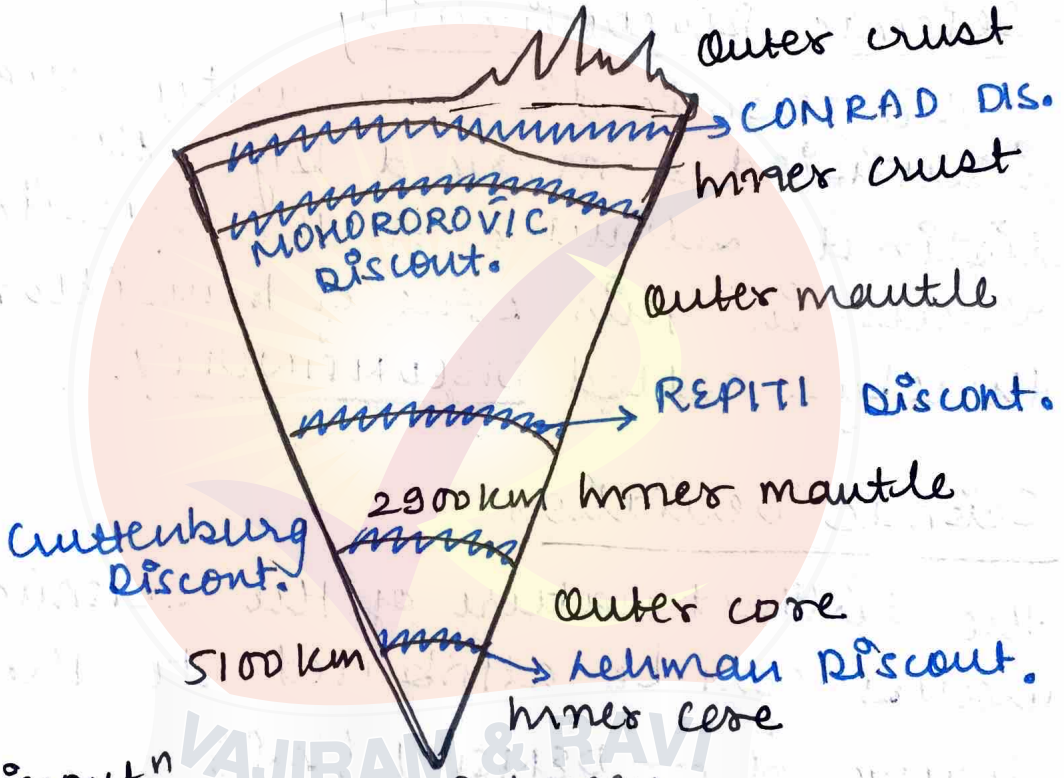
The change in density is responsible for causing deviation in the progression of waves due to REFRACTION. which portrays the altering angle of wave progression.



$y > x$

Refraction

Various discontinuities in Earth:



Discontⁿ	Between
Conrad	Outer - inner crust
Moho	inner crust - outer mantle
Repiti	outer - inner mantle
Gutenburg	inner mantle - outer core
Lehmann	inner - outer core

Discontinuities play an very important role in understanding earth's structural composition and merged with its impact on seismic waves, it can be very helpful in further understanding of Earthquakes

(4)

Ans) Planetary winds are the established wind patterns across the globe due to the macroclimatic factors whereas the local winds are generated due to Regional climatic factors.

Planetary winds	local winds
(1) They are the global winds, encompassing the whole world.	(1) They are limited to certain local regions.
(2) They are induced by the Thermal differentiation of the globe.	(2) They are induced by the pressure gradients or the orographic factors.
(3) They flow all round the year.	(3) They are either diurnal or seasonal.
(4) Their direct effect on a regional climate is less rather they affect macroclimate.	(4) They acutely influences local climate.
(5) Eg: Trade winds, Westerlies, Polar Easterlies	(5) Eg: Mistral, Foehn, Harmattan, etc.

Influence of local winds -

A) On Climate

1) Chinook - on leeward side of Rockies, warms the Region

2) Mistral - In winters, cools the western margin European countries & causes further decrease in temperature.

3) Loo - Enhances the Temp. of the Northern plains in India upto 45 - 50°C

B) On Agriculture

Foehn - on the leeward side of the Alps, enhances the temperature and melts snow → ∴ form climatic oasis in Switzerland - helping in early sowing of < wheat oranges
- checks autumn frost

C) On livelihood

Harmattan - 'Doctor wind' - alleviates the Guinea coast from humid conditions & reduces diseases.
- warm local winds ↑es temp. & enhances habitability.

local winds play a very important role in determining Regional climate.

(9)

Ans) Heat Budget Refers to the equilibrium sustained between the incoming solar Radiation and the outgoing ~~solar~~ Terrestrial Radiations resulting in conservation of Heat state of earth → upholding the Ist Law of Thermodynamics.

Features →

(1) The incoming solar Radiations is in the form of electromagnetic waves with high frequency (ν) and ~~low~~ short wavelength (λ)

(2) The outgoing ~~solar~~ Terrestrial Radiation is long wavelength, low frequency (ν) and low energy waves.

(3) Heat Budget is impart for maintenance of thermostatic Balance of the atmosphere.

- Heat Budget have three components

A) Albedo (A)

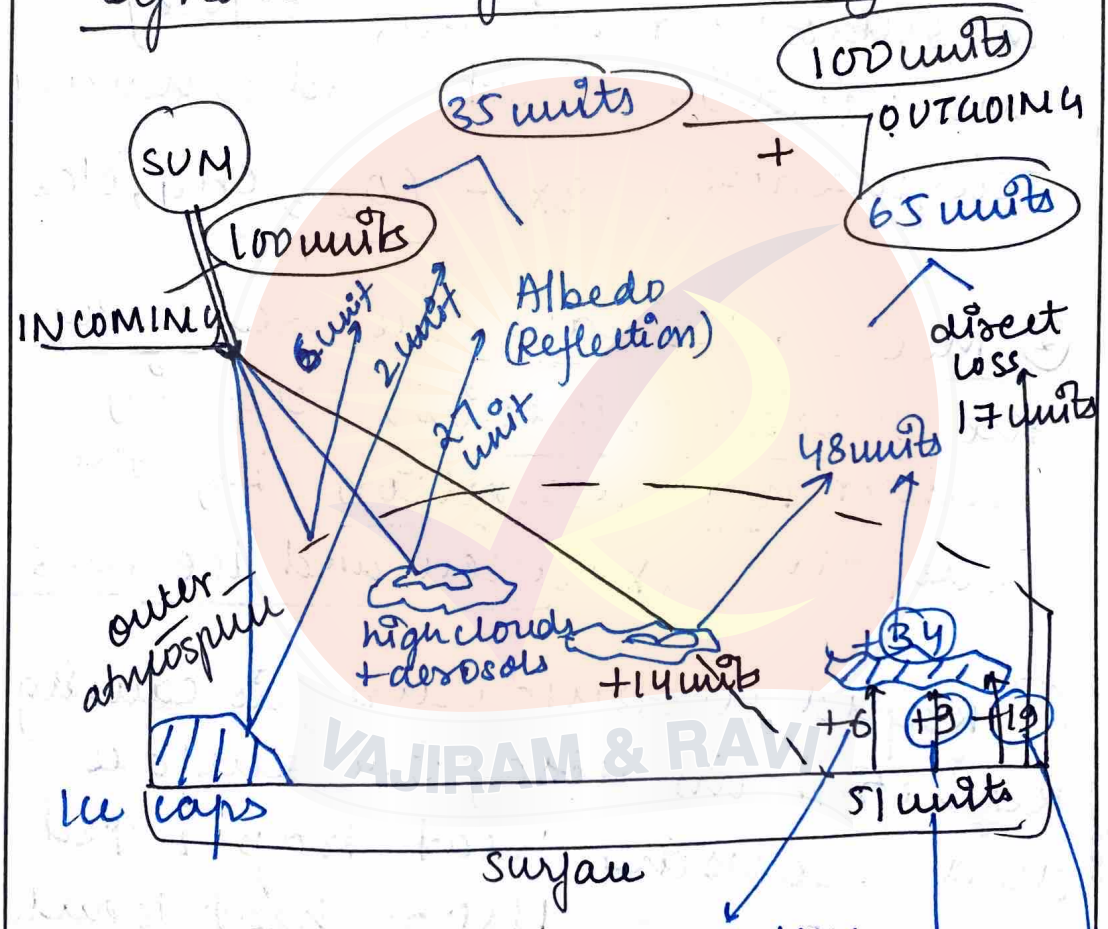
B) Insolation (I)

C) Terrestrial Radiations (t)

∴ Heat Budget Equation is -

$$R = I(1-a) - t$$

• Dynamics of Heat Budget -



Hence,

INCOMING — 100 units

35 units
(Albedo)
Reflection

65 units
post absorption and Re-radiation is lost

100 units — OUTGOING.

• Anthropogenic Inputs on Heat Budget -

① Higher amount of green house gases are creating a disbalance in outgoing radiation as they are holding heat and enhancing Temperature. Ex.- CO_2, CH_4, etc.

② Melting ice caps are reducing the Albedo (reflection) causing further heat absorption by the surface. Ex. Greenland Ice loss

③ Rapid urbanisation, is causing Reduction in absorptive surface area - causing heat trap & ↑ed Temperature Ex. Urban heat Island.

Heat Budget is a very critical aspect for maintaing equilibrium in Nature and any alteration in it would lead to devastating inputs ∴ Its the need of the hour to take rampant measures to decrease GHG Emissions & tackle climate cha