

Time Allowed : One and Half Hours
समय : डेढ़ घंटे



Maximum Marks : 125
अधिकतम अंक : 125

GENERAL STUDIES / सामान्य अध्ययन

Name Of Candidate परीक्षार्थी का नाम	MEDHA ANAND
Roll No./अनुक्रमांक	1910046856 ✓
Center Code/परीक्षा केंद्र	Online

*Center Code : For Online - 1900 / Delhi :

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Q. No. प्र.सं.	Max. Marks अधिकतम अंक
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9	
10	
Total/कुल अंक	125

Evaluator's Discretion/मूल्यांकन

11:00

12:30

Total Marks/कुल अंक :

Mode Of Examination/
परीक्षा की विधि :

Online/ऑनलाइन
Offline/ऑफलाइन

*Evaluator's Discretion is the marks awarded at the discretion of the evaluator based on your overall impression, on the basis of (but not limited to) your handwriting, presentation, use of diagrams, flowcharts, facts and figures or absolutely anything that he/she liked in your copy.

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Parameters	Excellent	Very Good	Good	Average	Poor	Very Poor
Language						
Structure						
Presentation						
Handwriting						
Content						
Attempt						

ADDITIONAL REMARKS

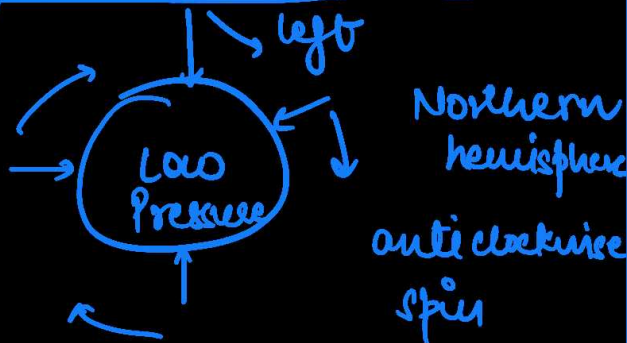


Q.1) What are the suitable conditions for the formation of a tropical cyclone? Also, bring out differences between a tropical and an extra-tropical cyclone. (10 marks, 150 words)

Tropical cyclones are a natural phenomenon resulting out of pressure differences on land and sea and may cause disastrous consequences and thus require to be studied effectively.

Suitable conditions for formation of Tropical Cyclone-

- (1) Core area of low pressure
- (2) Constant supply of water to give it energy
- (3) Coriolis force (due to Earth's rotation) to give it a spin



(4) ambient air temperature to give it a particular spin.

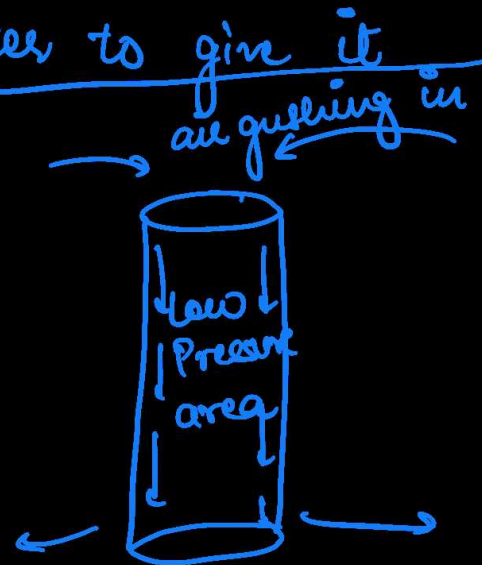


Fig- Formation of a tropical cyclone

Tropical Cyclone

- (1) Originates in Tropical area. ($23\frac{1}{2}^{\circ}N - 23\frac{1}{2}^{\circ}S$)
- (2) Pressure difference + Coriolis force leads to its formation.
- (3) Die on reaching landmass
- (4) Recent anomaly of cyclone not dying on land.

Extra-tropical cyclone

- (1) Originates in Temperate areas.
- (2) Air fronts owing to different air masses leads to their formation.
- (3) No such constraint.
- (4) Climate change leads to high force cyclones

Thus, varied geographical locations and natural factors leads to differences in formation of the type of cyclones in an area.

Feedback

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Structure/ Presentation
Question Interpretation
Content
Value Addition
Total



Q.2) Explain the impacts of Himalayas on the climatic condition of the country.

(10 marks, 150 words)

Himalayas are the fold mountains formed due to convergent boundaries of Indian and Eurasian plates and have a huge role in determining India's climate.

IMPACT OF HIMALAYAS ON CLIMATIC CONDITIONS OF INDIA -:

(1) Protect India from the cold waves of Tibetan Plateau.

⇒ led to a habitable gangetic delta and not a barren land.



Fig. showing importance of Himalayas

(2) Monsoon winds change direction after hitting Himalayas and thereafter give rain in the country.

⇒ 54% of Indian agriculture is rainfed.

(3) Pressure differences in Himalayas and Arabian Sea leads to rain bearing winds

to move over India \Rightarrow Monsoon is because of Himalayas.

(4) States of J.P., Uttarakhand and U.T.s of J&K and Ladakh get their peculiar climatic conditions due to Himalayas.

(5) Himalayas is also the originating place of many rivers and these rivers affect the local climate of various areas.

Thus, Himalayas act as the lifeline of the country and lead to the distinct climatic zones present in the country bringing in varied vegetation and economic prosperity.

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Q.3) What are seismic waves? How do seismic waves help in understanding of internal structure of the earth? (10 marks, 150 words)

Seismic waves are the energies that are emitted due to the movement of plates beneath the earth surface as propounded in Plate Tectonic Theory.

Types of seismic waves

- ① P-waves - Primary waves - like sound waves travel in solid, liquid, gas
- ② S-waves - Secondary waves - travel only through solid
- ③ R-waves - Surface waves - most destructive

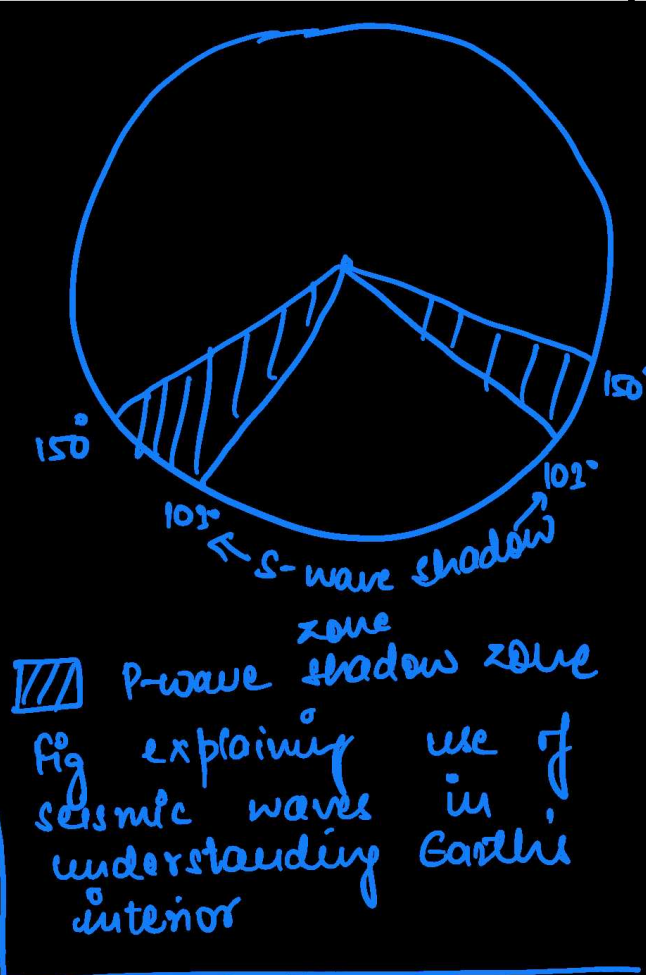
Seismic waves helping in understanding internal structure of Earth :-

These are the INDIRECT METHOD of studying Earth's interior, based on the property of the waves.

Example - Since S-waves travel only through solids and don't pass through outer core \Rightarrow OUTER CORE is liquid.

{ shadow zone of S-waves extend from $103^{\circ}N$ to $103^{\circ}S$ }

Also, differences in speeds of waves helps in understanding density differences.
 Ex - going deeper speed decreases \Rightarrow high density material towards the core (NiFe-Nickel and Iron based)



Thus, study of seismic waves give ample information indirectly on the composition of the earth and thus giving deeper insight into Earth's origin as well.

Feedback

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Q.4) Why is Antarctic becoming an area of renewed human interest? Examine the significance of Antarctic bill, 2022 in protecting India's interest in the region. (10 marks, 150 words)

Antarctic is a part of global common which is gaining importance with each passing day and an amicable use of the same is the need of the hour.

ANTARCTICA - becoming an area of renewed human interest -:

(1) Research objective - The pristine land offers great scope to study the origin of Earth. Ex - India's stations

include Dakshin Gangotri, Maitri and Bharati.

(2) Abundance of Mineral deposits - Huge fossil fuel deposits and minerals of importance are supposedly under the Antarctic ice sheet.

(3) Peaceful utilisation of the area is called for and nations want to ensure efficient distribution of the same.

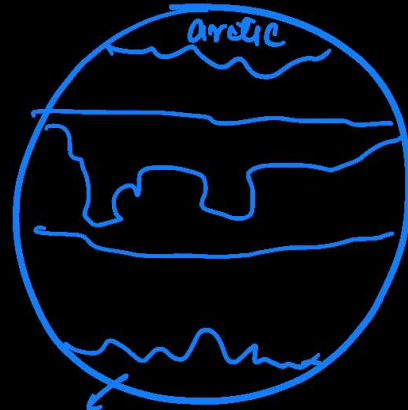


Fig. location of antarctic - global common

ANTARCTICA BILL - protecting India's interests -

- ① It aims to ensure de-militarization of the region alongwith getting it rid of mining or illegal activities.
- ② Bill seeks to set up Indian Antarctic Authority (IAA) for decision making in related matters.
- ③ ensure that nuclear tests aren't conducted in the region
- ④ ensure distribution of tourism and fisheries resources equitably with India
- ⑤ Enhance India's Polar Governance leading to enhanced collaboration & cooperation in scientific and logistics field.
- ⑥ Enable India to become eligible for being a legit & responsible member of Antarctica Treaty system.

Thus, Antarctica holds huge potential for misutilization and countries need to form a common ground to ensure effective use of our global commons.



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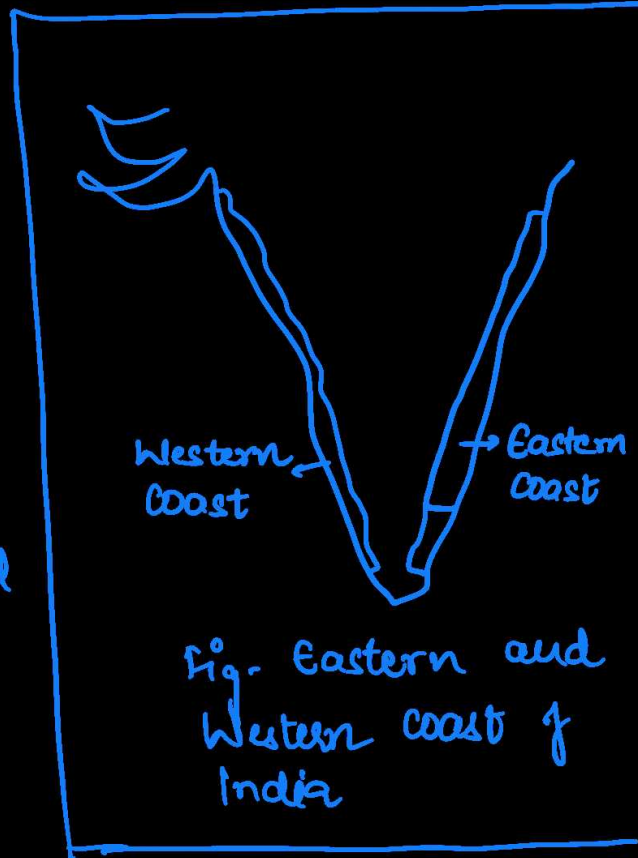
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Q.5) How does the Eastern coast of India differ in its geographical features from the western coast? (10 marks, 150 words)

Eastern and Western Coast of India are part of India's Coastal system and hold importance for India both Economically and strategically.

Eastern and Western coast of India have been formed owing to different reasons and thus, many differences are present in their geographical features across time and space.



EASTERN COAST	WESTERN COAST
① Formed due to emerged boundary condition.	① Formed due to submerged boundary condition.

- | | |
|--|---|
| (2) less number of gaps across the stretch | (2) Prominence of gaps across the stretch |
| (3) Mostly discontinuous stretch. | (3) accompanied by Western ghats and is continuous in nature. |
| (4) Narrow along the coast. | (4) Broad at the top and bottom. |
| (5) Easy Port Construction | (5) Difficult. |

Owing to the differences in the geographical nature of Eastern and Western coast, the flora, fauna as well as the economic activities get deeply influenced.

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Value Addition
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Q.6) All deserts are rain deficit, but are formed due to different reasons. Discuss. Also, analyse various adaptations in the flora and fauna to survive the water deficit conditions. (15 marks, 250 words)

Deserts are the rain deficit areas which result in a peculiar agro-climatic zone with different flora and fauna species present in the area.

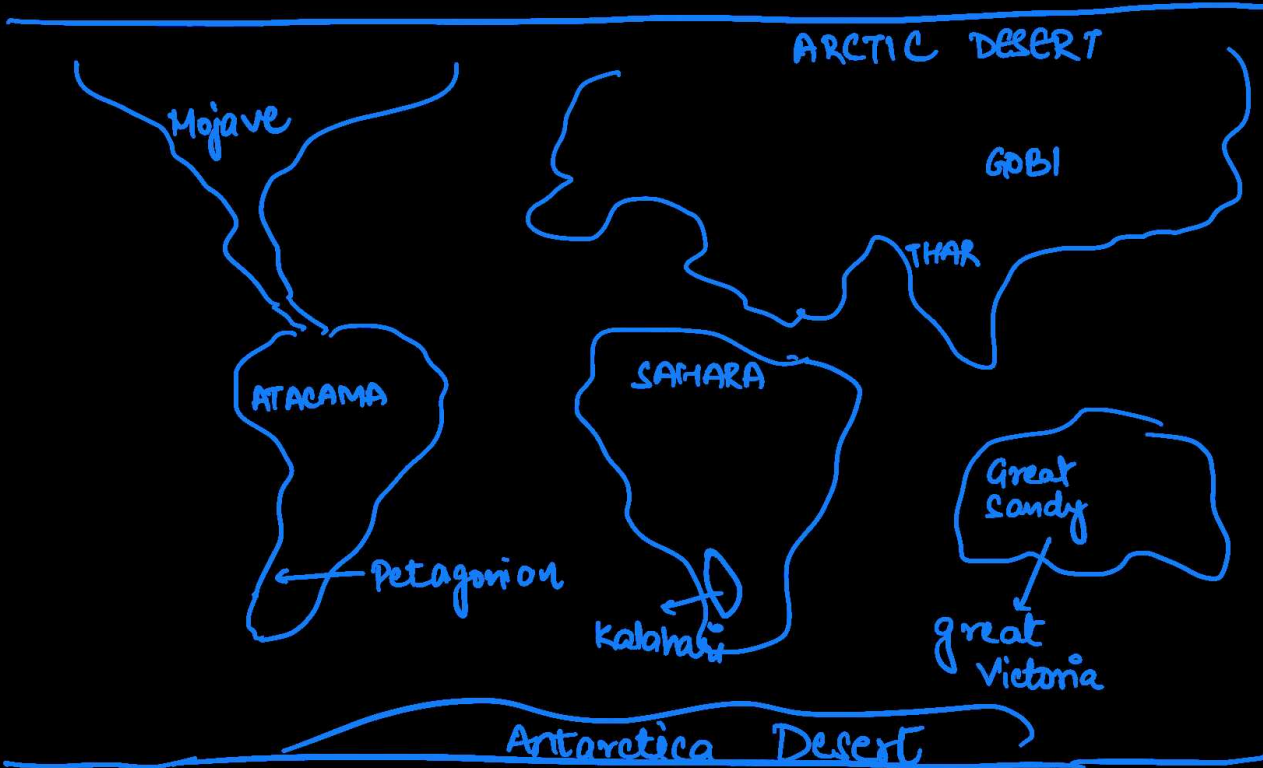


Fig - spread of Deserts across the world.

Different Reasons for Desert Formation :

(1) Ocean currents - Cold currents often lead to formation of deserts by preventing

rainfall in the particular area.

Ex- Atacama desert

(2) Leeward side of mountain inhibits enough rain in the area leading to desert formation. Ex- Thar desert on leeward side of Aravali Range.

(3) Wind pattern blowing offshore - within 15° - 30° North and South of Equator.

Ex- Sahara Desert

(4) Cold Deserts due to presence in Polar areas. Ex- Arctic and Antarctic Desert.

Adaptations in Flora and Fauna to survive desert conditions

(A) Cold Desert

(a) Flora - (i) roots don't die off and during favourable seasons plants grow.

(b) Fauna - (i) Presence of fur
 (ii) Hibernation in Polar Bears to save energy
 (iii) Aestivation
 (iv) less surface to volume ratio to conserve energy.

(B) Hot Desert

- (a) Flora - (i) less stomata on leaves
 (ii) growth during wet season
 (iii) waxy leaves to store water. ^{Ex} _{the}
 (iv) ensure least evapotranspiration

- (b) Fauna - (i) longer legs to prevent heat to reach body
 (ii) huge water storing capacity
 Ex - camels.
 (iii) fast runners, sleek bodies

Thus, nature has provided ample adaptations to ensure that both flora and fauna survive at extreme climatic conditions without much difficulty.

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Q.7) Describe the tri-cellular model of global atmospheric circulation. Examine its significance in explaining the world climatic patterns. (15 marks, 250 words)

Tri-cellular model of global atmospheric circulation explains the meridional circulation of air across the earth due to various dynamic and thermal reasons

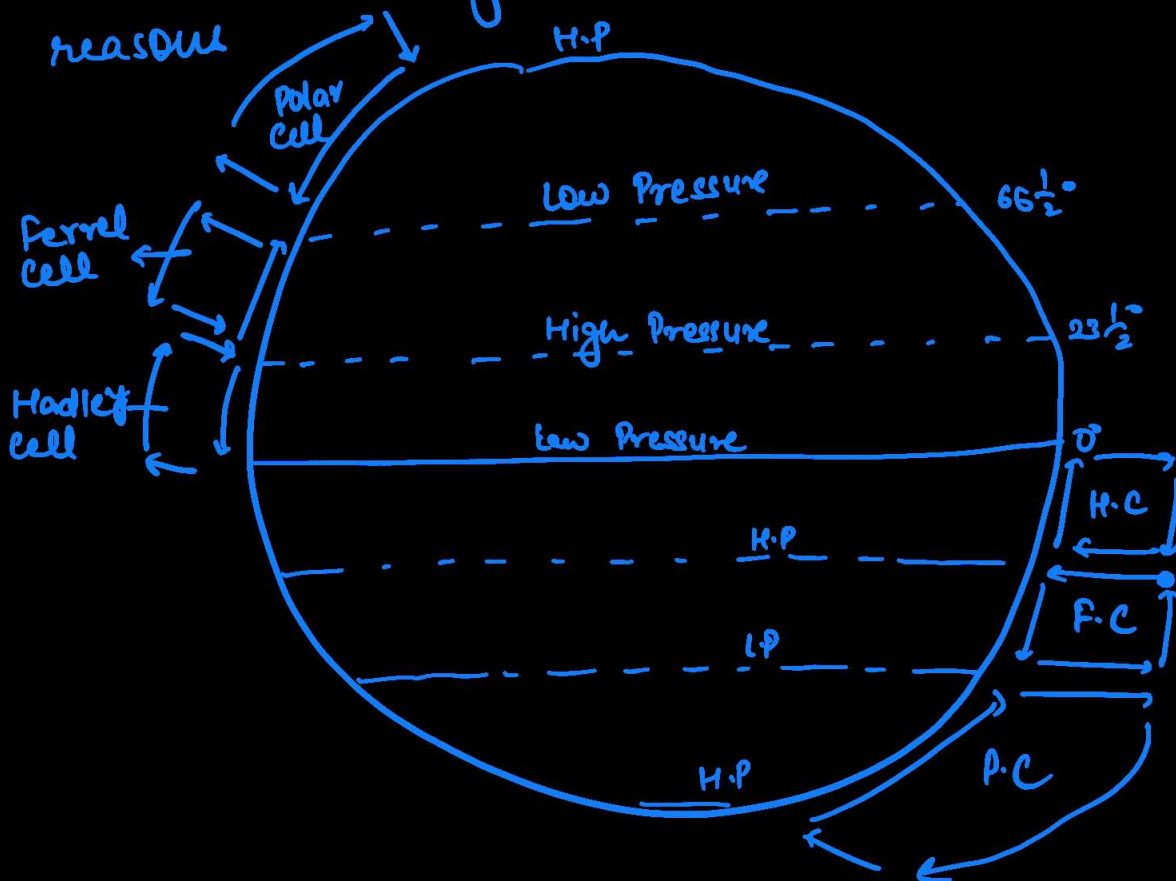


Fig- showing the tri-cellular model of air circulation

Since Equator has low Pressure and 23 1/2 degrees has high pressure, air moves from the tropics towards the equator while at

equator it rises up in the air due to convection and through the upper atmosphere reaches to the tropics to descend on the tropics \Rightarrow Hadley cell.

Ferrel cell -

low pressure air from $66\frac{1}{2}^{\circ}$ moves to $23\frac{1}{2}^{\circ}$ in the upper atmosphere, while air on the surface moves from high pressure to low pressure. This cell is formed to ensure continuity of Hadley and Polar cell.

Polar cell - formed due to temperature differences leading to formation of different air pressures.

Significance in Explaining world climatic patterns

- (1) Greater insight into the climatology and wind movement across the globe.
- (2) Helped in understanding how earth maintains its thermal balance.
- (3) Ocean currents are influenced by these movements.

(4) helped in further understanding of upper atmospheric air circulations like Jet streams.

(5) Impact of localized events like El Nino, La Nina can be also understood by these.

Thus, this model helped in understanding air circulation better thereby ensuring that mankind is able to better understand and predict natural phenomenon.

Feedback

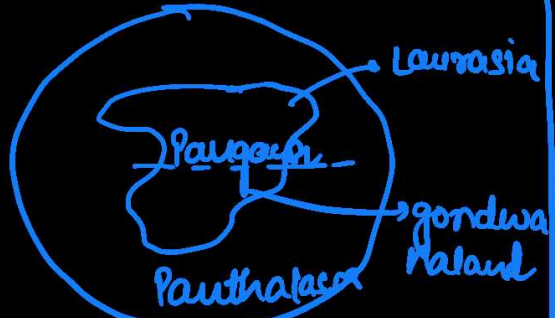

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Q.8) Compare the Continental Drift Theory and Plate Tectonic Theory. How does Plate Tectonic Theory explain orogenesis and volcanism? (15 marks, 250 words)

Continental Drift Theory and Plate Tectonic Theory are the theories which give deeper insights into formation of continents and oceans and also the related geomorphology.

CONTINENTAL DRIFT	PLATE TECTONICS
<p>(1) It was given by <u>Alfred Wegner</u> in 1912.</p>	<p>(1) It was given by <u>Mckenzie, Parker and Morgan</u> in 1967.</p>
<p>(2) Hypothesized that a mainland <u>PANGAEA</u> and water body <u>PANTHALASSA</u> existed.</p>	<p>(2) They explained presence of continental and oceanic plates, moving around forming & destructing the land mass.</p>
	<p>(3) Advocated 3 boundaries</p> <ul style="list-style-type: none"> (a) Convergent (b) Divergent (c) Transverse
<p>(3) This huge landmass broke into Laurasia</p>	 <p>Fig - Convectioal currents forming landmass</p>

In the North and Gondwana land.

③ Reasons for the drift

(a) Pole fleeing force - related to Earth's Rotation.

(b) Tidal force - due to gravitational pull of Moon.

④ Evidence -

- (a) glacial till
- (b) Jigsaw fit
- (c) Lemuria fossil
- (d) gold in Brazil & Africa

③ Reasons - Molten magma's convectional currents leading to Plate movements

④ Took cue from a) convectional Magma Theory

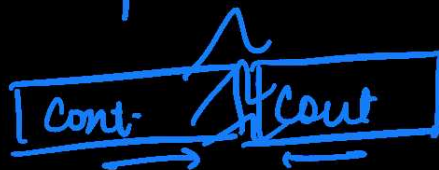
b) Ocean floor spreading theory of Henry Hess. - largely accepted theory

PLATE TECTONIC THEORY explaining

Orogenesis

When continental - continental theories converge, since they are too buoyant they don't submerge, but form mountains

ex-formation of great Himalayas b/w Asiatic Plate and Europe Plate



Mountain formation

PLATE TECTONICS explaining volcanism

When two plates diverge, the magma under them gushes in, in the form of volcanoes and form volcanoes.

Ex - Mt. Fiji, Mt. Alaska etc.

Thus, while Continental Drift Theory was the stepping stone, Plate Tectonics was the final nail which helped mankind in understanding the formation of various relief and geomorphic processes.

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Q.9) Describe the various factors responsible for formation of ocean currents and discuss their impact on different human activities. (15 marks, 250 words)

Ocean currents are the movement of water which help in shifting temperature, energy and resources from one part of the Earth to the other.



Fig - distribution of Ocean Currents over Earth

FACTORS RESPONSIBLE FOR FORMATION OF OCEAN CURRENTS-

(A) PRIMARY FACTORS-

- ① Insolation - Based on the amount of solar energy received by water their movement begins
- ② Air circulation - Ex - monsoon wind reverse ocean currents direction
- ③ Landmass - leads to directional change.
Ex - Chile landmass changes direction.
- ④ Coriolis Force - leads to clockwise currents in Northern hemisphere and anti-clockwise currents in Southern hemisphere.

B) Secondary factors

- ① Ocean salinity - Saline water has higher density and tends to sink in leading to changes in circulation.
- ② Climate change
Ex - Atlantic Meridional Oceanic current is losing its stability and may decline over some time.

IMPACT OF OCEAN CURRENTS ON HUMAN ACTIVITIES-

A) Economic Impact -

- (1) Mixing of currents act as Potential Fishing Areas (PFA's). Ex - Banks across USA.

(2) Hot water mixing leads to defreezing of ports \Rightarrow \uparrow economic activity

Ex - gulf stream leads to defreezing of a European Port.

(3) high fish numbers \Rightarrow \uparrow bird dropping near Peru \Rightarrow act as fertilizer for crops.

(B) ENVIRONMENTAL

(4) Some ocean currents bring droughts, disrupting local environment.

(5) Desert formation occur due to cold currents. Ex - on western side in mid-latitude

Thus, ocean currents play a huge role in changing landscape of a geographical area & if climate change tampers with it, it may lead to potential loss of livelihood.

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Q.10) With the help of a map, explain the distribution and characteristic features of different types of forests in India. Highlighting the major causes of deforestation, suggest steps needed to conserve forest resource of the country. (15 marks, 250 words)

The varied climatic conditions in India have given rise to diverse type of forests in India from thorn type to moist evergreen type



Fig showing distribution of forests in India

Characteristic features

- ① Alpine - grow on high altitude
 - Fir, Pine, chir

- needle like leaves to conserve water
- ② Moist tropical Evergreen
 - in western ghats (Windward side)
 - green throughout the year
 - dense canopy.
- ③ Tropical Moist Deciduous
 - not evergreen
 - more rain than desert
 - Sal, etc trees grow here.
- ④ Tropical Dry Deciduous
 - receive less rainfall than moist deciduous
 - on leeward side of western ghats.
- ⑤ Desert type - in Thar desert
 - thick cuticle in plants to save water
 - Ex - Sauri, Kher, cactus etc.

Major Causes of Deforestation

- (1) Growing population requires houses, offices etc.
- (2) Need for furniture leads to cutting of trees.

(3) Forest fires due to climate change also leads to large scale deforestation.
 (4) Need for fuel also causes deforestation.
 Ex - In Brazil, amazon rainforest are facing threat.

(5) Unsustainable living. Ex - Paper requirements etc.

STEPS FOR CONSERVATION :-

- (1) CAMPA funds should be used for afforestation.
- (2) Full fledged efforts to ensure environment triumph over economy.
- (3) REDD+ membership should put on on govt, NGOs & individuals to plant more trees.
- (4) World Environment Day should be used for promoting awareness.

Thus, as suggested in Brundtland Report, Sustainable development is the only way through which humans can survive in anthropocene

Feedback

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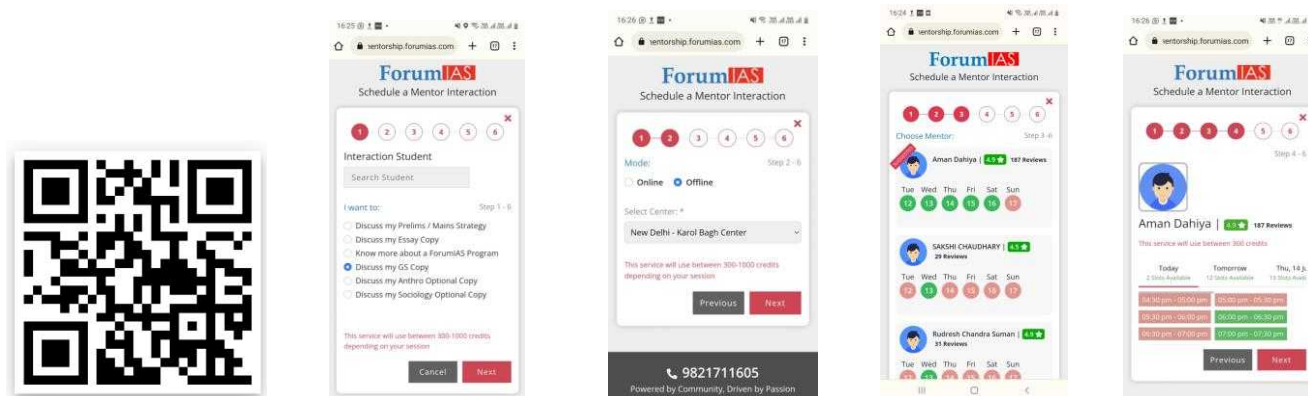
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