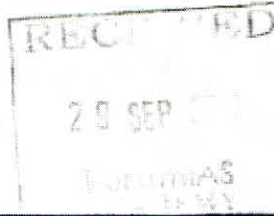



Test Code: 31010



FIAS - 2020 - GS10A/B

 <h1 style="text-align: center;">ForumIAS</h1> <h2 style="text-align: center;">ACADEMY</h2> <h3 style="text-align: center;">GENERAL STUDIES</h3>			
Name Of Candidate		MITHUN PREMAJ	
Email Id.		Roll No.	1910055909
Mobile No.		Date:	28/9/2019

Time Allowed: One and Half Hours

Maximum Marks: 125

INDEX TABLE			INSTRUCTION	
Q. No.	Max. Marks	Marks Obtained	<p>1. Please do furnish Name, Email, Roll No and Mobile in the answer sheet.</p> <p>2. There are TEN questions printed in ENGLISH, all questions are compulsory.</p> <p>3. The number of marks carried by a question/part is indicated against it.</p> <p>4. Answers must be written in the medium authorized in the admission Certificate, which must be stated clearly on the cover of this Question-Cum-Answer (QCA) Booklet in the space provided.</p> <p>5. Word limit in questions, if specified, should be adhered to. Any page or portion of the page left blank in the Question-Cum Answer Booklet must be clearly Struck off.</p> <p><i>Any specific messages for ForumIAS Mentors/ Evaluators with respect to your copy? Write it here.</i></p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	
1				
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Total Marks:				
Remarks:			Start Time 	End Time
			Mode Of Examination :	Online <input type="checkbox"/> Offline <input type="checkbox"/>
			ECN CODE:	Evaluation Date:



Q.1) Ocean warming has caused coral reef depletion via bleaching as well as deadly outbreak of diseases. Examine. (10 Marks, 150 Words)

Increased emission of greenhouse gases and other human activities have led to global warming which ~~which~~ has in turn led to oceans warming. The oceans absorb a large part of the excess heat in atmosphere.

Ocean warming - Impact on coral reefs.

i) Bleaching

~~Ocean warming~~

• Coral reefs are symbiotic association between Zooxanthellae and corals.

↓
Zooxanthellae thrive in a relatively narrow temperature range ↓

• Increased ocean temperature leads to expulsion of Zooxanthellae from corals.

Bleaching of corals → Nutrition crippled
↓
Reef death.

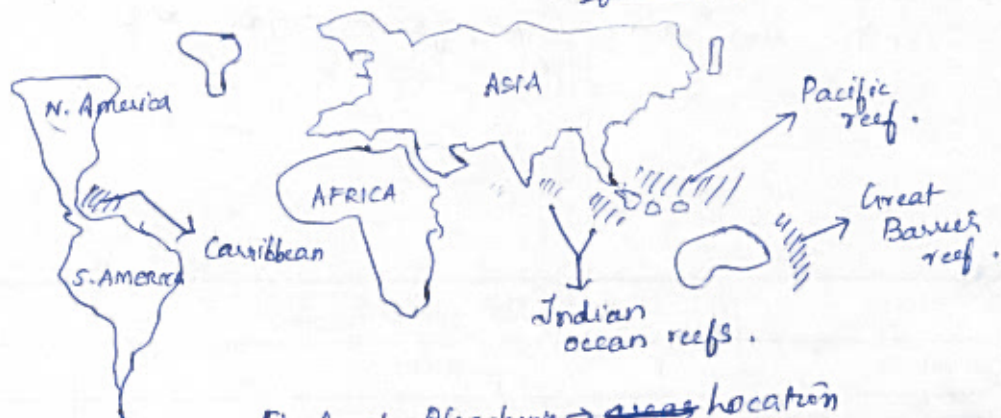


Fig: Coral Bleaching → areas location

- El-Niño, Indian ocean dipole phenomena, also ^{etc} leads to regional rise in sea temperatures leading to coral bleaching.
- The magnitude and frequency of bleaching events have increased in the past few decades owing to global warming and climate change.
- El-Niño years (1997, 2015-16 etc) have seen large portions of reef ^{beings} bleached leading to loss of biodiversity and function.

ii) Exzootic diseases

- Zooxanthellae and corals are also susceptible to diseases when temperature rises.

- Rising ocean temperatures

↓
Higher frequency/degree of
zooxanthic diseases

↓
Death of zooxanthellae/reef.

Warmer's

↑ Related acidification and decreased oxygen

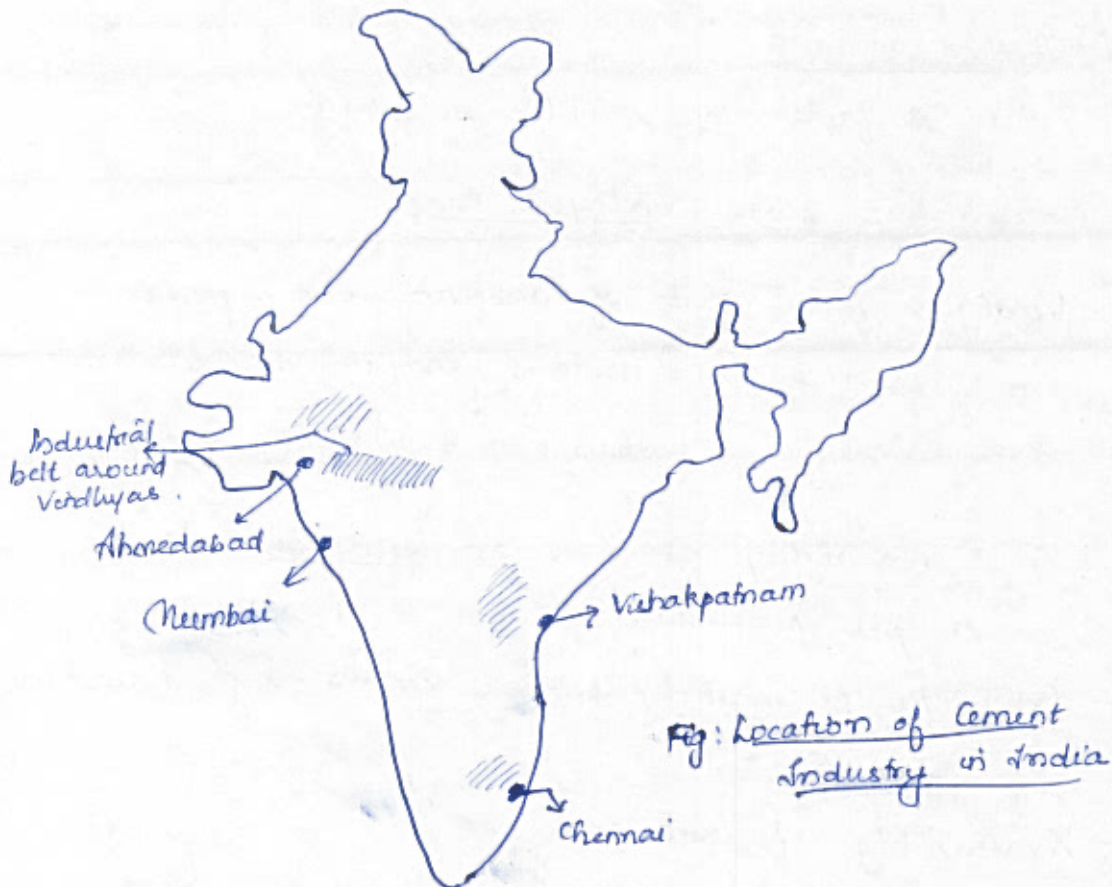
levels also adversely affect coral reefs.

Feedback (For OFFICE use only)

Structure		Content	
Question Interpretation		Total :	



Q.2) Enumerate the factors which are responsible for the location of the cement industry in India. Also, explain why the cement industry is mainly concentrated along the Vindhyas range. (10 Marks, 150 Words)



Factors responsible for Cement Industry Location

i) Raw material

- Limestone and dolomite are important raw materials.
- Being raw materials, being bulky and heavy, the industry has tended to concentrate near source of raw materials.

ii)

- Cheap power and labour are also significant factors.

- iii) Proximity to shipping ports
 - Ease of export^{of product} and import of raw materials.
 ex: Chennai

- iv) Market demand
 - Also a factor for smaller industries.

Concentration along Vindhyan Range

- Vindhya's form part of ancient rock system and is rich in limestone and/or dolomite.
 ↓
 Abundant availability of raw material
- Coal availability as well as hydropower → cheaper production
- Proximity to market/demand centres → Maharashtra, Gujarat etc.
- Availability of labour.

These Cement industry has remained relatively robust though affected by supply issues and price cost issues.

Feedback (For OFFICE use only)

Structure		Content	
Question Interpretation		Total :	



Q.3) How does the plate tectonics theory help in explaining the formation of Himalaya.
(10 Marks, 150 Words)

Plate tectonics theory proposes that the Earth's surface is comprised of giant lithospheric plates (Crust + upper mantle) floating on plastic asthenosphere and they ~~move~~ ^{are} in ~~a~~ continuous motion at very slow rates.

Himalayas Formation - Plate tectonics.

- i) There ~~was~~ ^{existed} a supercontinent, Pangea, more than 200 million years ago → comprising current South America, Africa, India, Australia and Antarctica. (Location - Southern Hemisphere)
↓
- ii) Pangea disintegrated and split into numerous plates around 200 million years ago.
↓
- iii) The Indian plate migrated northwards and Eastwards. (Force driving movement → convection currents in the mantle).
↓
- iv) Around 55 million years ago, it collided with the Eurasian plate in the Northern hemisphere.
↓
- v) Due to the mechanics of collision, the Indian plate ledge rotated a little and the underlying forces drove it northward movement further.
↓
- vi) The impact resulted in multiple accidents of crustal folding giving rise to the extensive and mighty ranges - The Himalayas.

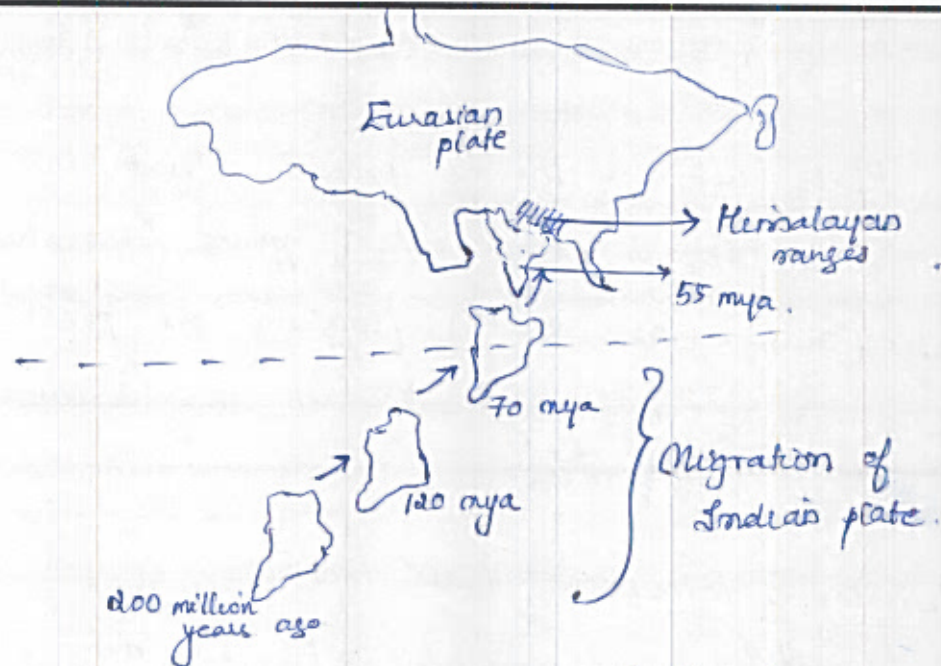


Fig: Formation of Himalayas .

The collision and rotation and subsequent events of folding has resulted in the orientation and ~~geomex~~ extent of Himalayas .

The Indian plate continues to move northward today, and Himalayas are still said to be rising by a small amount every year .

Feedback (For OFFICE use only)

Structure		Content	
Question Interpretation		Total :	



Q.4) Enumerate the causes and impact of soil degradation in India. List down the measures taken by the government to control soil degradation in India.

(10 Marks, 150 Words)

Soil degradation is the decline in the quality and functions of soil. The extent is due to various human and natural causes, soil degradation has accelerated over past few decades.

Causes

- i) Deforestation and destruction of green cover
 - For agriculture, industry, urban expansion.
 - Integrity, cohesion, quality of soil, ^{is} affected greatly.
 - ~~One of the main causes of~~
- ii) Overgrazing - Removal of grass cover resulting in soil erosion and degradation.
- iii) Misuse of chemical fertilizers and pesticides - soil quality and fertility affected.
- iv) Encroachment of wetlands → leading to floods, wash off.
- v) Solid, liquid, industrial, electronic waste

Impact of soil degradation

- i) Desertification - large parts of North western India has seen ^{extensive} soil degradation and desertification.

ii) Loss of soil fertility

- Adverse impact on agriculture → low crop yield, increase in crop diseases.
- Large agriculture-dependent population is affected

~~iii) Soil erosion and loss of top soil~~

iii) ~~Water~~ Groundwater recharge capacity reduced.

iv) Pollution - associated health problems.
 ex: Chemical residues in crops, animals etc.

Government measures

i) Afforestation drive through various measures

- Compensatory Afforestation (CAMPA) Act.
- Green Highways / Green India Mission.

ii) Integrated Watershed Management Programme -

Comprehensive management of watershed including afforestation, restoration of soil fertility and quality etc.

iii) Commitment to UN Convention to Combat Desertification (UNCCD)

- Specific drives to address soil erosion, desertification etc.

Feedback (For OFFICE use only)

Structure		Content	
Question Interpretation		Total :	



Q.5) What are the factors which affect ocean salinity? Also, explain the causes and impact of the distribution of salinity. (10 Marks, 150 Words)

Ocean Salinity - Factors affecting salinity

i) Latitude

- Lower latitude \rightarrow Higher temperature \rightarrow Higher evaporation \rightarrow More salinity.

es: Tropical waters are more saline than Arctic/Antarctic waters.

ii) Rainfall

- Higher rainfall \rightarrow freshwater dilution \rightarrow lower salinity.

es: Equatorial waters less saline than tropical.

iii) Freshwater inflow \rightarrow glaciers, river water inflow reduces salinity.

iv) Continentality \rightarrow Surrounded by land (es: Inland seas)

\downarrow
 \uparrow temperature

\downarrow
 \uparrow evaporation \rightarrow \uparrow salinity.

es: Dead Sea

v) Ocean currents

- Can transport saline water miles across the globe.

es: North Sea salinity higher due to North Atlantic drift.

es: Western ocean margins generally more saline than Eastern.

Distribution of Ocean salinity

i) General trends

- Decreases from equator to poles.

- Higher along western margins of Oceans than Eastern.

- Higher for marginal seas compared to open seas or oceans.
- Lower in areas with large freshwater influx.

Impact

- Affects the distribution of fishes ~~and~~ and impact on commercial fisheries.
- Affects vertical water movement/currents due to density differences → resulting in upwelling and downwelling.

Saline water more dense than freshwater.

↓
Saline water sinks at depths
↓
Displaces water, which then moves along gradients formed by temperature and salinity.
↓
Upwelling occurs at ~~other~~ ^{open} location.

Feedback (For OFFICE use only)

Structure		Content	
Question Interpretation		Total :	

Q.6) Land use patterns affect as well gets affected by Climate change. Elaborate

(15 Marks, 250 Words)

Feedback (For OFFICE use only)

Structure		Content	
Question Interpretation		Total :	

Q.7) Discuss the conditions required for the formation of a tropical cyclone. How is a bomb cyclone different from a normal cyclone? (15 Marks, 250 Words)

A tropical cyclone is a low-pressure system formed over tropical seas due to heating ~~of~~^{of} the ocean by the sun. It is accompanied by severe winds, thunderstorms and heavy rainfall.

Conditions required for Tropical cyclone

- i) Availability of warm water with sea surface temperature above 27°C .
- ii) Availability of plenty of moisture - evaporation across vast stretch of seas.
- iii) Low vertical wind shear \rightarrow should allow vertical cloud development.
- iv) Already existing pressure differences (low pressure area).
- v) Presence of Coriolis effect necessary
Due to negligent/low Coriolis effect, tropical cyclones usually do not form along the equator.

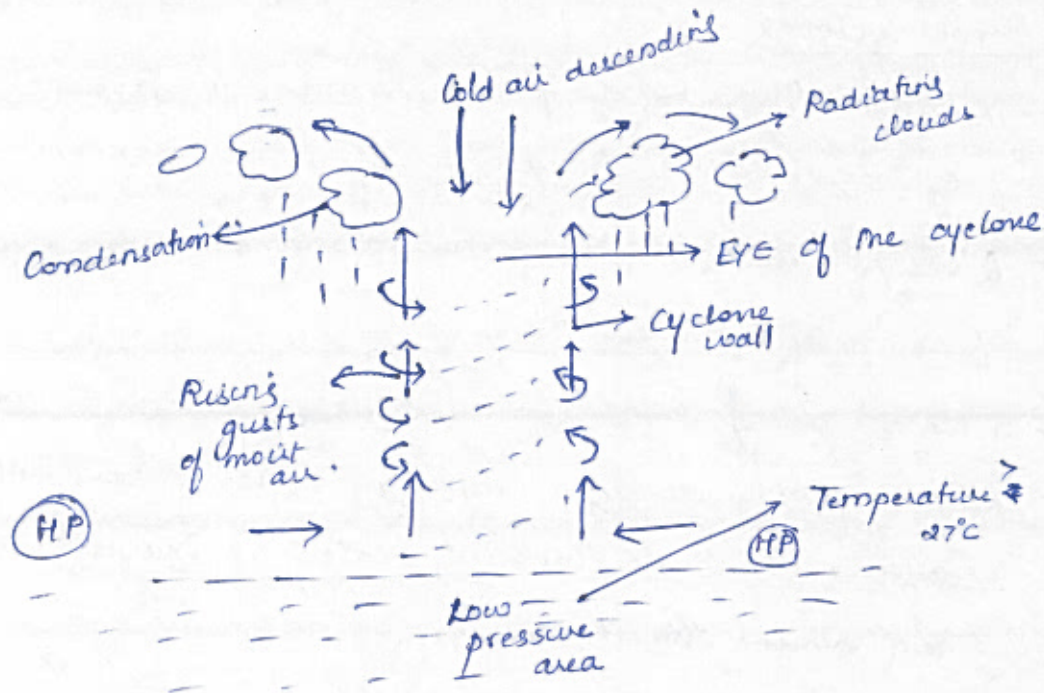


FIG: TROPICAL CYCLONE

Normal Cyclone - Properties .

- i) Tropical cyclones usually develop only over sea Oceans/Sea.
- ii) Move westward generally (East → West)
- iii) Have large extent (compared to extra-tropical cyclones)
- iv) ~~Does~~ starts to dissipate after it makes landfall
(As moisture supply is cut-off and it is the latent heat of condensation that drives the cyclone)
- v) Is accompanied by heavy rains, fast and destructive winds and thunderstorms.

es: Thane cyclone, Vayu cyclone, Ockhi cyclone (South India)

Bomb cyclones

- Formed through a process similar to tropical cyclones, called Bombogenesis.
- Develops due to the ^{sudden} formation of an extremely low pressure area/zone.
- Attracts gusty winds from ^{surrounding} high pressure areas.
- The cyclone develops rapidly → associated with swift vertical development, extensive thunderstorms and cloud bursts.
- Extremely destructive in nature.
- However, duration of the cyclone is lower compared to normal cyclone.

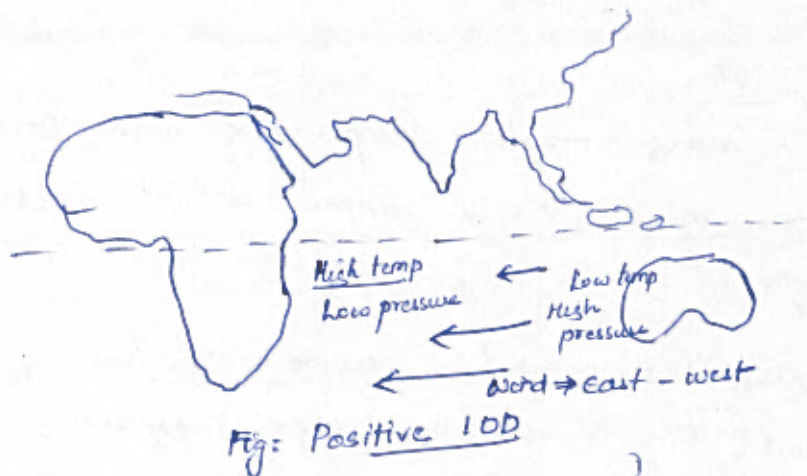
Feedback (For OFFICE use only)

Structure		Content	
Question Interpretation		Total :	

Q.8) What do you understand by Indian Ocean dipole? Explain the mechanism of Indian Ocean dipole and explain its impact on monsoon rains in India. (15 Marks, 250 Words)

Indian Ocean Dipole (IOD) phenomenon is a ^{periodic} phenomenon of fluctuating sea-surface temperature across Eastern and Western margins of the Indian Ocean.

Indian Ocean Dipole - Mechanism



- Usually, the Eastern margin of Indian ocean has a lower temperature and higher pressure compared to western margin.
- Hence the overall wind direction is East to West.

- However, periodically, the sea surface temperature across eastern and western margins reverses ~~with~~ with a periodicity of around 3-4~~5~~ years.
- The western margin becomes cooler with higher pressure compared to eastern margin.
- This periodic fluctuation is referred to as Indian Ocean Dipole.

Positive IOD

- Eastern margin → low temperature, high pressure
- Western margin → high temperature, low pressure.

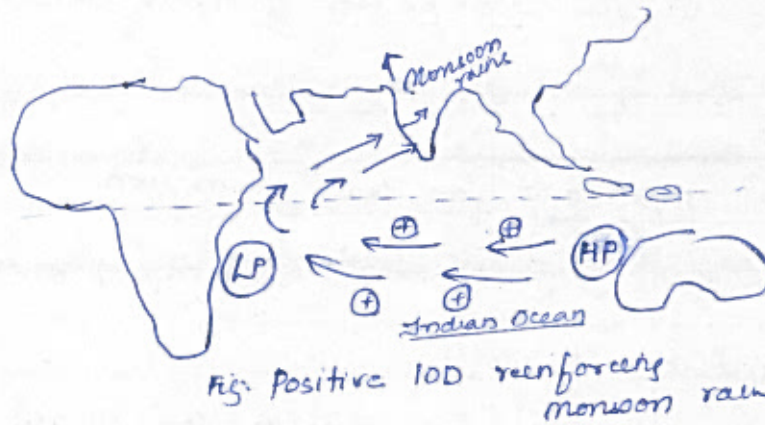
Negative IOD

- Western margin → low temperature, high pressure and vice versa for eastern margin.

Impact on monsoon

- Positive IOD reinforces the trade winds and provides sufficient moisture which improves the monsoon rainfall.
- Negative IOD adversely affects the trade winds and hence reduces the moisture supplied to the Indian sub-continent via these winds → reducing monsoonal rainfall.

- In combination with El Niño or La Niña, they produce significant fluctuations in year-on-year monsoonal rainfall.



Feedback (For OFFICE use only)

Structure		Content	
Question Interpretation		Total :	

Q.9) Discuss the formation and importance of river deltas. Also, enumerate the existing threats to river deltas and suggest measures to overcome these threats.

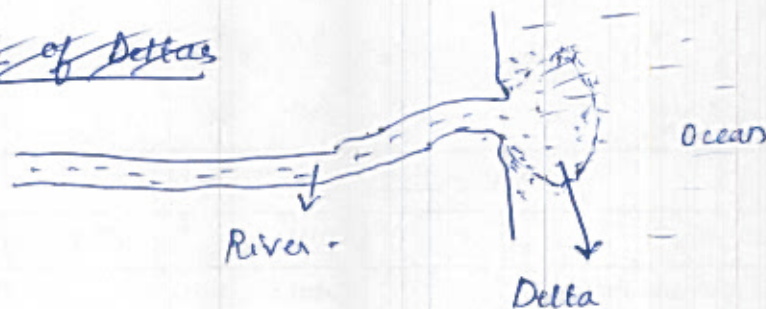
(15 Marks, 250 Words)

River deltas are depositional features of rivers formed in the Old ^{stage} phase of rivers usually at the outlet or mouth of rivers.

Factors important for delta formation

- i) Sufficient load (~~silt~~ ^(silt, sediment)) should be carried by the rivers.
- ii) Absence of large lakes during the course of the river (as lakes filter sediment load).
- iii) Absence of ocean currents perpendicular to the opening of the river.
- iv) Absence of large tidal variations.
- v) Pace of river should be low at the end enough to effect deposition of sediments.
- vi) Seafloor/^{shelf} should be, ^{relatively} shallow beyond the coast enough for sediments to form delta.

Importance of Deltas



Importance of Deltas

i) Highly fertile rich agricultural land → Many of the important cultivation areas in India are Deltas.

es: Rice cultivation - Ganga delta, Godavari - Krishna deltas etc.

ii) Buffer against tidal surges, stormwaves, tsunamis, etc cyclones etc.

iii) Sediments rich in minerals which can be extracted commercially.

iv) Rich biodiversity → Both on land as well as marine biodiversity.

es: Sunderbans National Park -

v) Home to numerous mangrove species

vi) Plain level land → Infrastructure development

es: Roads, railways etc

vii) Mineral and oil resources es: Krishna basin

Threats to River Deltas

i) Marine coastal erosion → especially in the light of extreme weather events like storm surges etc.

ii) Overexploitation of resources:

- Soil erosion.

- Biodiversity loss

- iii) Development and urbanisation
 - Unscientific construction and infrastructure expansion.
- iv) Pollution → Soil and water
- v) ~~the~~ Increasing frequency of floods.

Measures

- i) Coastal management plan → ^{to be} well designed and implemented.
- ii) Mangrove afforestation.
- iii) Measures to reduce coastal erosion.
 - Mangroves
 - Groynes.
 - Off shore barriers etc.

Feedback (For OFFICE use only)

Structure		Content	
Question Interpretation		Total :	

Q.10) Explain how local winds are different from planetary winds, giving examples, highlight the role of local winds in influencing climate, agriculture and livelihood in various regions. (15 Marks, 250 Words)



FIG: Planetary winds

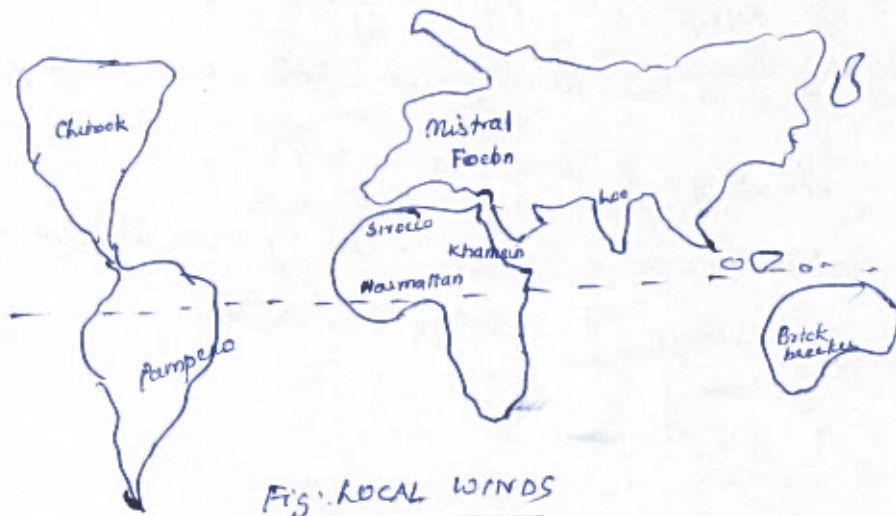


FIG: LOCAL WINDS

Planetary winds

◆ Influenced mainly by:

- i) Direction of rotation of Earth.
- ii) Coriolis effect
- iii) Latitudinal heating difference
(Formation of different pressure belts).

• So, they are formed develop as a result of large scale pressure differences happening across the planet.

Local winds

- ~~Are~~ Develop due to local weather differences, i.e. temperature and pressure differences.

ex: Sea breeze during day time due to differential heating of land and sea.

Hot Mountain wind blows from mountain to valleys at night.

Feedback (For OFFICE use only)

Structure		Content	
Question Interpretation		Total :	

Mentor Feedback Questions

- 1
- 2
- 3
- 4
- 5

Test Goal

- 1
- 2
- 3

Outcomes

-
-
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-

Marking Scheme

Marks	Good	Average	Below Average
10 Marker	3.75 – 5.0	3.0 – 3.5	< 3.0
15 Marker	5.75 – 7.0	4.0 – 5.5	< 4.0

*Subject to change without prior notice.

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