



An Institute for Civil Services

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SRISHTI MISHRA

AIR 95

CSE 2023

GEOGRAPHY



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591

~~Deepshikha~~

~~2024-25~~

~~2024~~

~~1408~~

(1235)

8/12/18

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Srishti Mishra

Test 43

Geography

8/12/18

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Answer Questions in NOT MORE THAN the Word Limit specified for each in the Parenthesis.
(Specimen Answer Booklet - For Practice Purpose Only)

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Q1.

Global warming refers to the heating, gradual temperature rise of the earth due to anthropogenic agents causing the enhanced greenhouse effect. This has led to changes in oceanic current movements, in turn affecting marine life.

Introduction is well contextualized

Effect of Global warming on Ocean Systems

- ① Differential heating and steeper temperature gradients :- excessive heating in tropical areas creates strong low pressure zone, pulling ocean currents with greater speed.
- ② Polar heating is reducing cooling effect of the poles on the subpolar/subtropical regions.

Should have elaborated this point separately

- ③ Warm currents are dominating colder currents, leading to melting of polar ice which is enhancing raising sea levels and impacting salinity of the region.

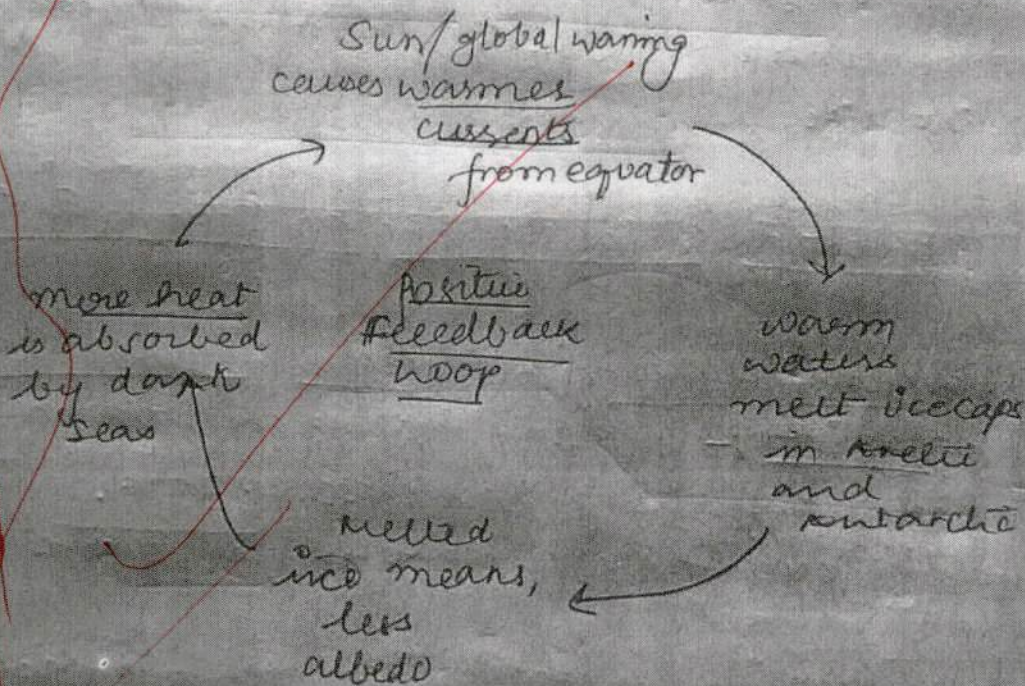
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- ④ Greater (more intense) heating of the continents near shores also affects movement of water streams.

Reinforcing Climate Change:-



Connect points are with question

Effect on marine life

- ① Melting ice has impacted salinity levels in polar regions drastically.
- ② migratory species are shifting to cooler regions to counterbalance increase in temperatures.
- ③ Pole-ward shift of species and niche competition for habitat



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- ① Productivity degradation and habitat loss
- ② Change in underwater flora due to changes in temperature.
- ③ Coral reefs are especially sensitive to changes in temperature.

Global warming has also (in some region) positively impacted productivity in oceans, contributing to growth in marine ecosystems.

But overall, global warming can drastically impact marine life. And for a planet covered with 70% water, that could be a severe tipping point.

Not discussed
→ ocean gyre
→ how global warming
speed up oceanic
circulation

Conclusion
is valid

5 1/2

Attempt all Contexts
along with
explanation
necessary

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में केवल प्रश्न संख्या
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Q2.

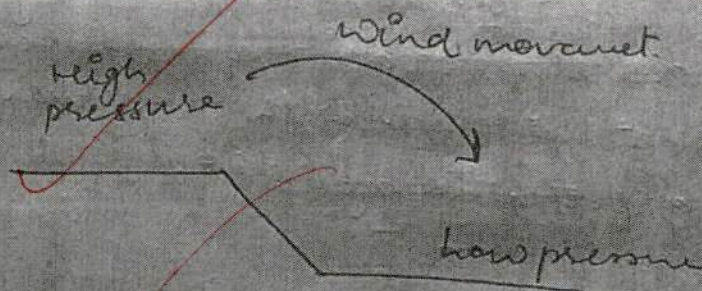
microbursts are sudden "bursts" of air that take place at high speed in a limited area.

Needs further explanation of microbursts

mechanism of microbursts:-

① sudden pressure gradient in a localized region.

eg:



can be elaborated as well

② Quick movement of wind to fill in low pressure system.

③ Short duration, then back to normal conditions.

Since this is a case of sudden disequilibrium, it is usually unpredictable and can have unwanted consequences.



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Hazardous Impact of microburst :-

- ① Harm to structures like
 - ① weak buildings
 - ② make shift construction
 - ③ weak trees.

② Harm to flora, fauna

- ① Trees/plants can be uprooted
- ② Humans can be affected by strength of wind.

③ Accidents on roads / spread of small fires can expand area affected.

- ④ visibility reduction due to dust.

Assurance Against microburst :-

- ① Create stronger, deep rooted structures.
- ② Flexible foundations of various man-made structures -
eg: bridges, buildings.
- ③ Safety precaution in construction.

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कृपया केवल प्रश्न
के क्रम संख्या को
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⑤ Enhanced data for measuring
microburst occurrences and planning
quick mitigation.

Since microbursts are a
relatively smaller phenomenon in terms
of mass, they should be locally
pursued and handled effectively.

Contexts are
touched last
further
on many
Contexts you
need
explanation
many of my
mentioned

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Q3.

Coral reefs are an example of symbiotic life in which algae and fungi work together to propagate their lives. Although the best known corals are found in the Great Barrier Reef, Lakshadweep is also home to corals of much importance. These are however, under various threats :-

Coral Reef Bleaching ~ the Process

- ① It is the zooxanthellae that give corals their colours.
- ② They reside on the 'calcium carbonate' body of the coral and derive nutrients whereas the corals derive photosynthetic products from the colourful zooxanthellae.

- ③ Any small stress (environmental change) can ~~create~~ result in death of zooxanthellae, resulting in the

Needs to be explained further
bleaching of the corals which eventually leads to coral deaths.

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Causes of Coral Reef Bleaching

① Increased levels of CO_2 in the oceans is creating carbonic acid.



This acid is harmful to the corals, resulting in bleaching.

② Increased temperature of ocean water due to global warming is also stressing corals (they are unable to handle wide temperature ranges).

③ Effects of harmful tourism.

Lakshadweep has become a tourist hub and a common vacation spot.

④ Rise of hotel construction.

⑤ Reclamation of the sea to increase ~~the~~ land area.

⑥ unplanned waste management and uneducated tourism.

all these causes are creating clogged regions, suffocating coral life.



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① Harmful UV radiation due to ozone layer depletion as a result of ODSs by anthropogenic activities.

② Sea levels rising are contributing to inward shift of corals and bleaching of lagoons.

Corals are an essential part of environmental heritage and a hotspot of biodiversity. Their bleaching is a sign for the call for action for climate action, SDG 13.

Controversial
Reasonably as
well

lakshadweep

Not discussed
correct



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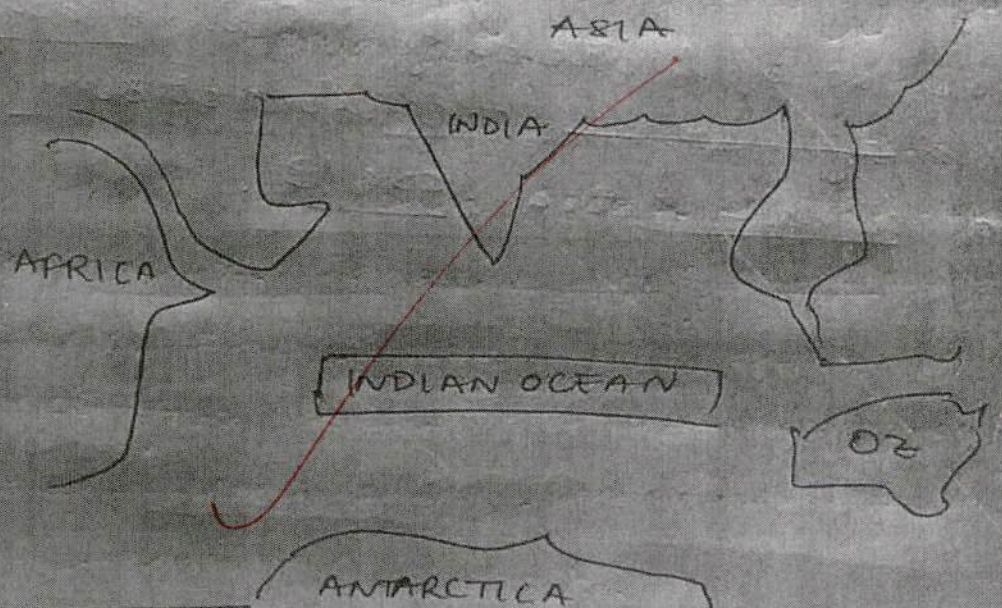
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Q. 11

Good start

The Indian Ocean is the mass of water that is encircled by Asia to the north, Africa to the west, Australia to the east and Antarctica to the south. It has been the source of not just atmospheric disasters but also ocean floor treasures.



mapping is relevant

Indian Ocean & Cyclones

③ The Indian Ocean alongside the Arabian Sea contribute to a large share of world's cyclone production with Arabian Sea creating 7% of total.



Page

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② Most of these cyclones are strong and long lasting.

③ various local currents and seasonal systems contribute to their formation

eg. Madden-Julian Oscillation
Mascarene High
Indian Ocean Dipole

④ Tsunamis are also common in this region due to tectonic shifts resulting in sudden waves within oceans (near convergent boundaries).

However, Indian Ocean is also important for mineral & Energy sources

① minerals :-

① polymetallic nodules are found in abundance in depths of the ocean, eg: deep trenches

② seafloor minerals produced by mantle at an region of divergent plate boundary
eg: Maldives Ridge.

Needs
separate
elaboration

why?

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नहीं लिख
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② Energy Sources

① Hydrothermal energy.

② Oil and shale gas in offshore plants

eg: Daman, Dui, Mumbai High, etc.

③ Tidal energy

④ Wind energy (offshore) ~

harnessing wind energy above ocean air.

Thus, the Indian Ocean is the source of much change and growth over the centuries. First, the monsoon leading explorers to India and today, the source of energy and raw material for economic growth.

Conclusion is relevant with question as well

Contexts one family only touched

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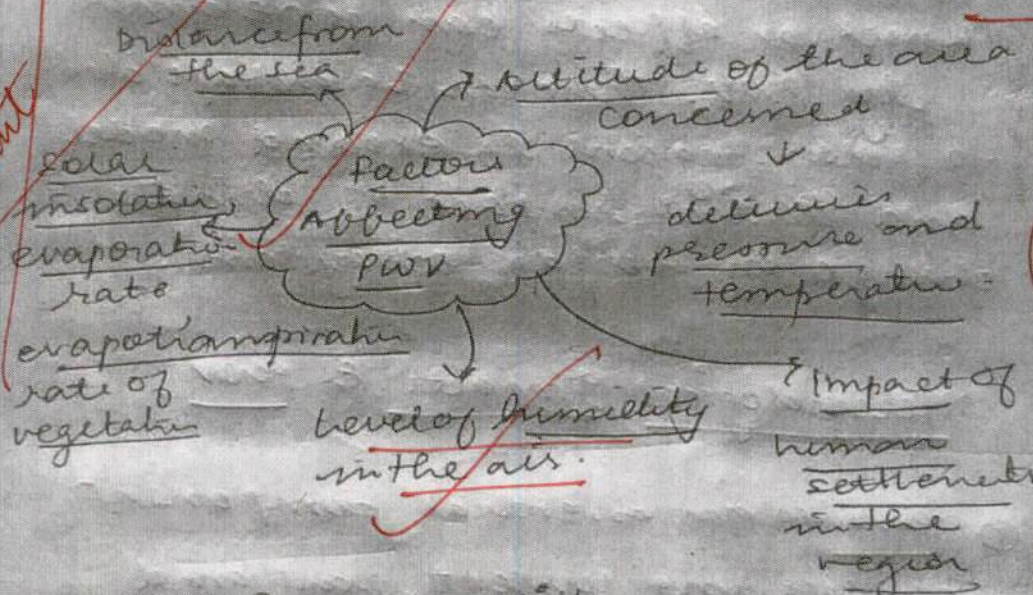
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95.

Precipitable water vapour (PWV) refers to the water vapour in the air that can be condensed and fall as precipitation (rain or snow) in the Himalayan Region.



Climate Impact on High Altitude Himalayas

- ① PWV affects the level of
- ② moisture in the air
- ③ precipitation

④ As a result, it impacts both flora and fauna in the region.

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- ③ microclimate of the region is also determined through local PWV levels.
- ④ Ecosystem self-sufficiency and impact of climate change can be gauged from PWV levels in the region.
- ⑤ long term climatic impact and knock on effects can be determined by PWV. These can be extrapolated to polar regions to expand model and predict impact of climate change on world's ecosystems.

Contexts connected with this question

meteorological Impacts & PWV

- ① PWV is an essential component of determining current, past and future climate of the region.
- ② Any anthropogenic / technological interference can be affected by PWV and can impact various elements in ecosystem.

eg: ① precipitation levels

② impact on glacial melting / freezing.



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① Impact on inconspicuous rivers like Ganga, Yamuna, Indus.

③ Climate Change Impact can be effectively modelled for purpose of mitigation and scientific research.

The Himalayas are known as the "Roof of the World" to hence emphasizing their significance. They are home of various elements that can impact the living of whole species and its ecosystem substantially preserve the Earth and its resources.

5 1/2
Focus on elaborating the context to meet the demand of the question

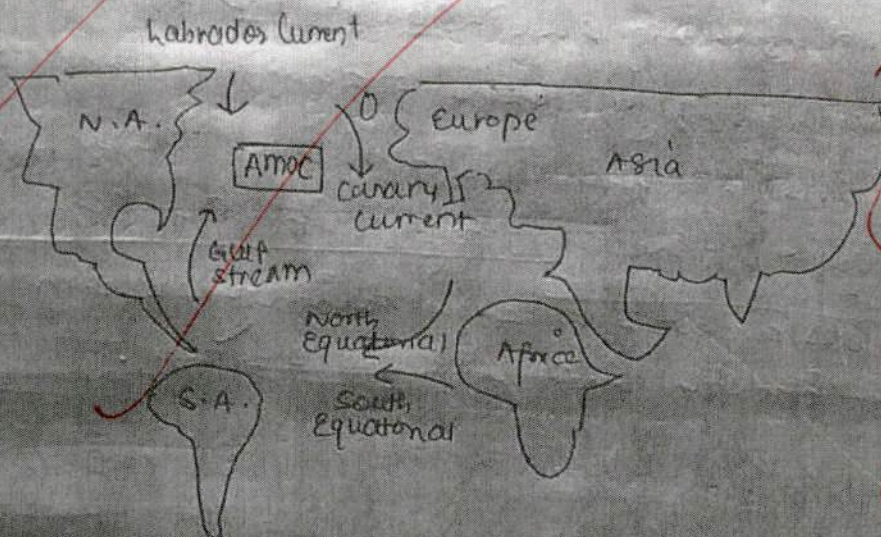
Conclusion is to the point

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Q6.

The Atlantic meridional overturning circulation (AMOC) refers to the circulation of ocean currents in the North Atlantic ocean consisting of various warm and cold ocean currents.



Warm currents : North Equatorial & Gulf Stream.

Cold currents : Labrador + Canary Current.

Over the years, this circulation is seeing a slowdown, some breakages, resulting in drastic consequences.



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Reasons for Decline of AMOC :-

① Global warming - the warming of ocean water is reducing the impact of cold currents like Labrador.

② Enhanced pressure gradient due to differential heating is causing speeding up of the cycle.

③ Changes in atmospheric pressure temperature is creating changes in jet streams, cyclones, westerlies, thereby hurting ocean currents as well.

④ Disturbances in polar regions are causing sudden dispelling of cold air towards the south.

Threat of Decline of AMOC :-

① Effect on migratory species, stressed flora and fauna. This may lead to biome shift, niche competition, due to habitat loss and extinction of species unable to quickly adapt.

How is reduced the impact?

Identified point one but cannot be explained further

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Answer Questions in NOT MORE THAN the Word Limit specified for each in the Parenthesis.
(Spend some Answer Booklet - For Practice Purpose Only)

② Threat to Mediterranean type climate such that it impacts vegetation / growth of horticultural crops etc.

③ Extreme weather in Mediterranean & Arabian risk of cyclone formation rises in hotter oceans.

The AMOC keeps local temperature and climate stabilized. Climate Action - SDG 13 is essential to save humanity from the ^{consequences} of AMOC decline.

Context covered - But one do give equal importance to all

Conclusion is reasonable as well

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Q.7.

Flagship Species are the charismatic species of fauna that are used as "flag-bearers" for the overall purpose of ecosystem preservation and restoration.

eg. Cheetah, Tiger, Elephant.

Grassland - Open Natural Ecosystem

① Grasslands are one of the most widespread biomes in the world known by different names:

- ① prairies in South America
- ① steppes in North America
- ① Savannahs in Africa.

② They form the transition biome between deserts and tropical rainforests and hence lie between 25° to 30° North & South of the equator.

③ They are characterized by large amount of tall grasses (elephant grass) few trees and resistance to forest fires.

Page

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Introduction of Flagship Species to Save Grasslands

② Most of the flagship species are essential to grassland ecosystem.

③ Cheetahs and Tigers hunt herbivores like deer and therefore keep their population in check.

④ Cheetahs also help ensure stability in primary productivity and reduce the burden of herbivores on grassland ecosystems.

⑤ Elephants act as natural "thrashers" by roaming the grasslands.

⑥ However, keystone species should also be given equal if not more attention.

⑦ Species of flora like acacia trees are the few tree growth acting as shade providers in the savannah.

points mentioned are contextual

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② Smaller animals like mice and
rats, etc. keep the soil aired
and well mixed.

③ Project Cheetah and Project
Elephant Any ecosystems are essential
to maintain ecosystems but all
even keystone species must be
emphasized to ensure ecosystem
stability.

Recent shift of cheetahs to
Kuno National Park, MP was the
right step, but more is required
for true conservation of pronghorn
grasslands.

Conclusion is
misleading
with question

Contexts
reasonably
covered

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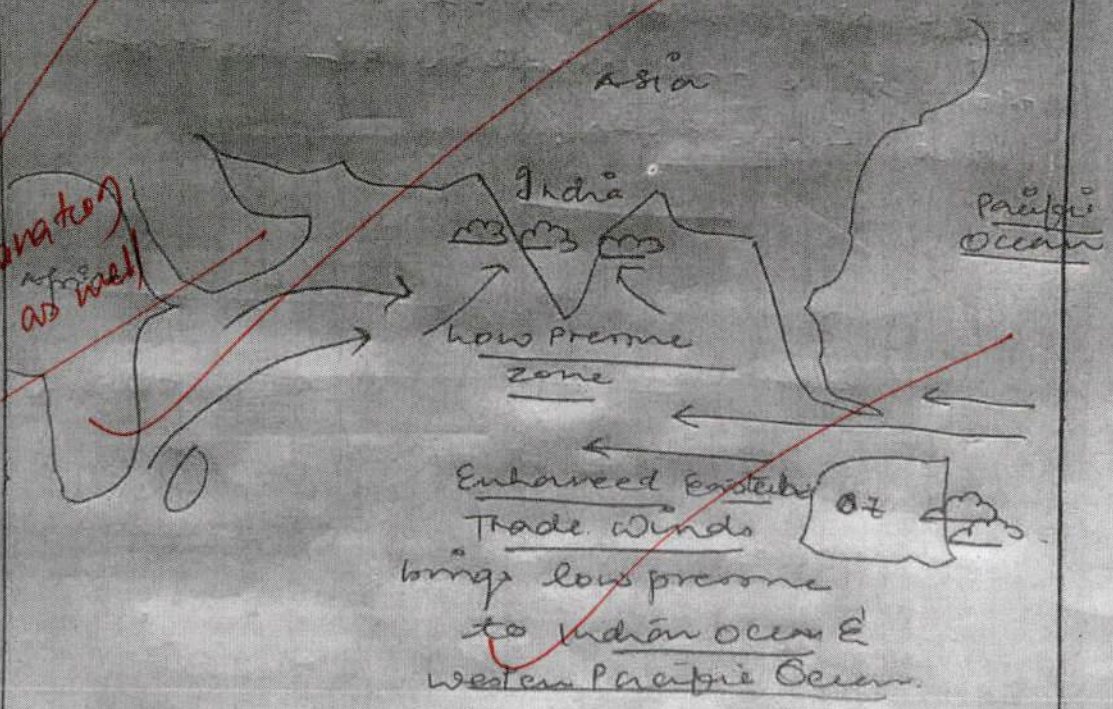
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Q8.

The Double Dip La Niña phenomenon is the case in which La Niña takes place twice in a row. The ordinary case is such that El Niño and La Niña takes place at an interval of 5-7 years. Double Dip involves two consecutive occurrences.

La Niña Phenomenon



Info given
on Double
Dip - La Niña
is correct

Needs
no words
as well



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Double Dip La Niña and Effect:-

- ① Enhanced winds from the east
(North E. South Equatorial Trade
Winds) push the warm Pacific
water to the west.
- ② low pressure zone near the Indian
subcontinent strengthens.
- ③ This pulls winds like Somali
Jet Stream and equatorial
winds towards India, which
pick up moisture on the way.
- ④ Monsoon showers are amplified
due to concentration of low
pressure zone.
- ⑤ Lesser, good rains and floods
is experienced in India.
- ⑥ Double Dip ensures that the same
phenomenon takes place in the following
year, resulting in enhanced agricultural
yields and more floods.

Thus, Double Dip La Niña is a
boon for farmers in India and
Australia.

Connected
with
question

effect of
Indian
monsoon or
in general

Be Specific

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लिखा जायेगा

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margin.

At the same time, much flooding
results in cities like Bengaluru &
Mumbai.

Double Dip - phenomenon.
not detailed
(just covered only
on intro.)

Economically and politically,
good monsoons result in better
income on the Indian government,
thanks to Double Dip phenomenon.

5

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Q9.

Recently, cities in coastal America witnessed the formation and disintegration of a bomb cyclone.

Formation of Bomb Cyclone

- ① sudden heating of seas leads to creation of evaporation and low pressure formation.
- ② In a very short duration, the circulation of air around the eye (low pressure zone) leads to the formation of the cyclone.
- ③ Just as suddenly, when the cyclone hits land, it precipitates with much force and quickly dissipates.

A bomb cyclone is thus a smaller, quicker and more unpredictable version of a hurricane/cyclone.

Q9. can be improved by including one sentence on incident.

Should include a note on its formation

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Difference Between

Hurricane

Bomb Cyclone

① Requires various
conditions for
formation

eg: temperature
above 27°C of sea
surface.

② long duration
of formation in
which it develops
from small to
mature cyclone.

③ dissipates over
time on land
reaching land

④ Can strengthen
again if it finds
source of water.

⑤ more destructive
due to strong
winds

⑥ larger area
affected.

① Requires relatively high
temperature of sea
compared to
neighbouring sea
surface.

② little formation
time, smaller
span of maturity

③ smaller in size

④ Quick dissipation
when it hits the
coast.

⑤ life cycle ends as
soon as it rains
once

⑥ less destructive,
smaller area of
affected.

from mentioned
one
valid



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लिए केवल
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Thus bomb cyclones can be
classified as mini-hurricanes
as they develop similarly. But
their mitigation/adaptation
approach differs slightly due to
the various dissimilarities with
hurricanes.

Conclusion
is relevant
as well

Do give equal
importance
Contexts.

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लिखना न
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लिखनी है।
अन्य लिखना
नहीं चाहिए।
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Q.10.

Soil is an abiotic component of any ecosystem that serves as the medium for the growth of various biotic components and by acting as the source of nutrients and even the habitat / niche of various flora / fauna.

Intro is relevant with context

Soil Vegetation Symbiosis

② Much of primary productivity depends on soil. Similarly soil health depends on vegetation. As a result both have interdependent roles in the natural system.

① Soil & Vegetation

a) Soil is the powerhouse of various nutrient cycles like

- Nitrogen cycle
- Phosphorous cycle
- Carbon cycle

} Important elements in plant growth.



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Answer Questions in NOT MORE THAN the Word Limit specified for each in the Parenthesis.
(Specimen Answer Booklet - For Practice Purpose Only)

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b) Soil harbours various bacteria that nourish plants.

eg: Nitrogen-fixing bacteria

c) moisture in soil helps in providing water for photosynthetic processes in the plants.

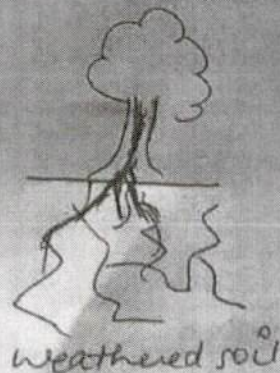
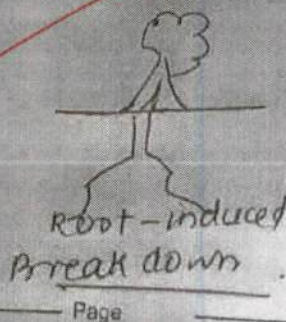
d) soil acts as the leverage for plants to grow into trees and the was with for seeds to germinate.

e) soil acts as a recycler of nutrients.
Soil is so necessary that trees do not grow where soil is permanently frozen like in tundra region with permafrost.

2. Soil is modified by vegetation.

a) The roots of plants break up rocks and weather the soil.

b) Biological weathering :



Page

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c) Safety from water and wind
erosion - roots hold the
soil together.

eg: mangrove ecosystem.

d) Vegetation ensures balance
between atmospheric levels
vs. soil levels of Carbon,
Nitrogen, etc. and support
the Gaseous Cycles.

Soil & Vegetation work together
to maintain equilibrium across
biospheres throughout the world.
Initiatives like "LIFE" (lifestyle for
Environment) must consider this
symbiosis to ensure sustainable
livelihood and development.

7
Contexts are
reasonably
covered in
answer
question