

NEXT IAS

MTS - ADVANCED INTEGRATED MENTORSHIP 2024

(To be filled by candidate)

Test Code : AIM2402

Test No. : 02

Name of Candidate : RITIKA CHITLANGIA

Roll No. : AIM24GCRA075 Start Time : 10:30 End Time :

Date of Examination : 12/7/24 Medium : English Hindi

Q. No	Maximum Marks	Marks Obtained
1	10	
2	10	
3	10	
4	10	
5	10	
6	10	
7	10	
8	10	
9	10	
10	10	
TOTAL MARKS - 100		

Q. No	Maximum Marks	Marks Obtained
11	15	
12	15	
13	15	
14	15	
15	15	
16	15	
17	15	
18	15	
19	15	
20	15	
TOTAL MARKS - 150		

GRAND TOTAL - / 250**EVAL CODE:** **EVAL DATE:****GENERAL INSTRUCTIONS**

1. Immediately on receipt of the QCA booklet, please check that this QCA booklet does not have any misprint or torn or missing pages or items, etc. If so, get it replaced by a fresh QCA booklet.
2. Candidates must mention all relevant details like Name, Email, Roll No, Mobile, etc. in the space allocated.
3. Candidate is expected to attempt all 20 questions within the given timeline.
4. Answers must be written in the medium authorized at the time of admission.
5. Candidates must write answers for the specific question under the respective question itself. Any answer written outside the space allotted may not be given credit.
6. Please write neatly. Avoid illegible writing.
7. Do not write/mark irrelevant matters in the QCAB.

सामान्य निर्देश

1. QCA पुस्तिका प्राप्त होने पर कृपया तुरंत जांच लें कि इस QCA पुस्तिका में कोई पृष्ठ या सामग्री आदि गलत छपी हुई या फटी हुई या गायब तो नहीं है। यदि ऐसा है, तो इसे एक नई QCA पुस्तिका से बदल लें।
2. अभ्यर्थियों को सभी प्रासंगिक विवरण जैसे नाम, ईमेल, रोल नंबर, मोबाइल नंबर आदि का आवंटित स्थान पर उल्लेख करना होगा।
3. अभ्यर्थियों से अपेक्षा की जाती है कि वह आवंटित समय-सीमा के भीतर ही सभी 20 प्रश्नों के उत्तर-लेखन का प्रयास करें।
4. प्रापेक उत्तर, प्रवेश के समय चुनी गयी भाषा के माध्यम में ही लिखे जाने चाहिए।
5. अभ्यर्थियों को विशिष्ट प्रश्न के उत्तर संबंधित प्रश्न के नीचे ही लिखने होंगे। आवंटित स्थान के बाहर लिखे गए किसी भी उत्तर को क्रेडिट नहीं दिया जाएगा।
6. कृपया साफ-सुथरा लिखें। अस्पष्ट/असंगत लेखन से बचें।
7. QCAB में अप्रासंगिक तथ्यों को न लिखें / न ही चिह्नित करें।

REMARKS:

Student Concerns / Query	Evaluator's Feedback / Response
1	1
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2	2
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.....
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3	3
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MARKING SCHEME *

MARKS PER QUES	Below Average	Average	Above Average
10 Marks	Below 3.00	3.00 - 3.75	4.00 and above
15 Marks	Below 4.50	4.50 - 5.75	6.00 and above

*Subject to change without prior notice.

IMPORTANT QR CODES



Topper's Copy



Common Mistake and Correct Filled QCAB



Copy Scanner App



Next IAS Test Centre Location

MACRO COMMENTS

The purpose of evaluation @NEXTIAS is to provide constructive suggestions on 'How to improve Answer Writing and thereby score better marks.

STRENGTHS OF THE CANDIDATE

AREAS OF IMPROVEMENT

IMPROVEMENT SUGGESTIONS

Q.1 गुटनिरपेक्षता की नीति किस प्रकार भारत और अन्य नव स्वतंत्र राष्ट्रों को अपनी संप्रभुता बनाए रखने और औपनिवेशिक दबावों का प्रतिरोध करने की आकांक्षाओं को प्रतिबिंबित करती है? (150 शब्द, 10 अंक)

How did the policy of non-alignment reflect the aspirations of India and other newly independent nations to maintain their sovereignty and resist colonial pressures? (150 words, 10 marks)

The beginning of cold war coincided with the independence of India, with Non Alignment Movement being India's response to the global bipolar politics.

Founding
Members
of
NAM

J.L. Nehru (India)

Gamal Abdel Nasser (Egypt)

Kwame Nkrumah (Ghana)

Sukarno (Indonesia)

Non Alignment : Aspirations of India

(a) sovereignty

1) Helped India to bypass the influence of USA and USSR.

2) Allowed India to follow the 'mixed economy' model, instead of pure capitalism or communism.

3) Asserted India as the leader of

3rd world countries.

4) Helped in self-determination,
by avoiding war, proxy
conflicts etc.

(b) Resist colonial pressures

1) NAM allowed India to prevent
neo-colonialising tendencies of
the then geopolitical order.

2) Elevated India's position by
allowing access to negotiation
platforms.

Eg: Nehru helped intermediate the
Korean crisis.

3) Helped to gain benefits from both
superpowers \Rightarrow India and other
newly independent countries became
'swing states'.

Nevertheless, NAM did have its
limitations in a polarised
world, but was a crucial
instrument in the foreign
policy of a young independent
India.

Q.2 एशिया एवं अफ्रीका में उपनिवेशवाद से मुक्ति की प्रक्रिया को तीव्र करने में द्वितीय विश्व युद्ध के प्रभावों का विश्लेषण करें।
(150 शब्द, 10 अंक)

Analyze the impact of World War II in accelerating the process of decolonization in Asia and Africa.
(150 words, 10 marks)

World War II ended in October 1945, with the beginning of a new phase of global politics, marked by the cold war and rapid decolonisation of Asia and Africa.

Impact of World War II in Decolonization
Process of India & Africa

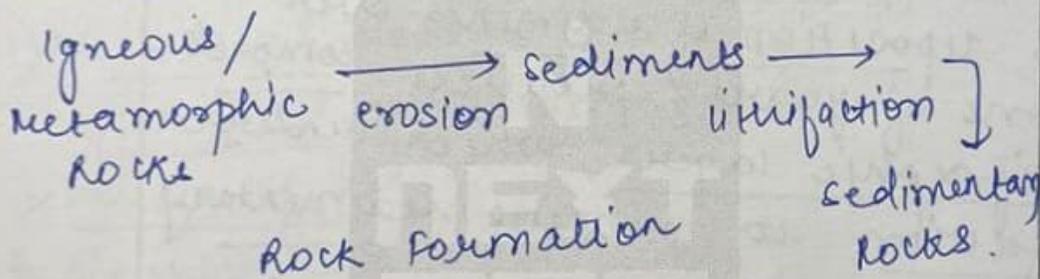
- ① Financial weaknesses of the colonisers due to war-time leakages → Britain, France had become too weak financially to sustain colonies.
- ② Atlantic Charter i.e. the right to self determination created moral pressure on the colonisers.
- ③ Rise of Nationalism in the colonies. Eg: Vietnam, Ethiopia, Egypt, India etc.

- ④ masses recognised the true nature of colonial rule. \Rightarrow World wars were fought among the European nations to protect their colonies \Rightarrow equally culpable like the fascist regimes.
- ⑤ shattering the myth of European invincibility. Eg: Japan's success in initial war years.
- ⑥ Formation of the United Nations post world war \square hastened the decolonisation by advocating for self-rule. Eg: Egypt's Nationalism.
- ⑦ Nationalist leaders were ready to take advantage of the war years. Eg: Quit India Movement 1942, Individual Satyagraha 1940.
- Thus, post world war \square , the colonisers could no longer support the 'Providence mission' away, financially or morally.

Q.3 अवसादी चट्टानों के विभिन्न प्रकार और उनकी निर्माण प्रक्रियाओं पर चर्चा करें। अवसादी चट्टानों का आर्थिक महत्व क्या है? (150 शब्द, 10 अंक)

Discuss the various types of sedimentary rocks and their formation processes. What is the economic significance of sedimentary rocks? (150 words, 10 marks)

Sedimentary rocks are the result of the erosion, weathering, compaction and lithification of sediments, under great pressure and temperature changes.



Types of Sedimentary Rocks

① Arenaceous Rocks ⇒ composed of compaction under high heat and pressure conditions, leading to hard rock formation, not easily impacted by the gradational forces.

Eg: sandstone.

② Argillaceous ⇒ fossilised stratigraphic layers, with alternating

bands of permeable and porous rocks.
Eg: Clay and chale.

3) Calcareous Rocks \Rightarrow composed of
calcium carbonate.

Eg: Limestone.

Formation of sedimentary Rocks

- ① Igneous/metamorphic rocks undergo erosion and weathering to produce sediments.
- ② The deposition of sediments over billions of years, produces compact stratigraphic layers, which undergo lithification to produce sedimentary rocks.

Economic significance

- 1) Building stones. Eg: Aravalli's provide red sandstone, ocean sandstone etc. for various monuments.
- 2) Fossilised rocks \Rightarrow presence of coal, oil, gas etc. in sedimentary rocks.
- 3) Rich in bases \Rightarrow extremely fertile soil. Eg: Terra Rosa.
- 4) Mineralised waters due to supergene enrichment.

Therefore, sedimentary rocks are reservoirs of geological & economic significance.

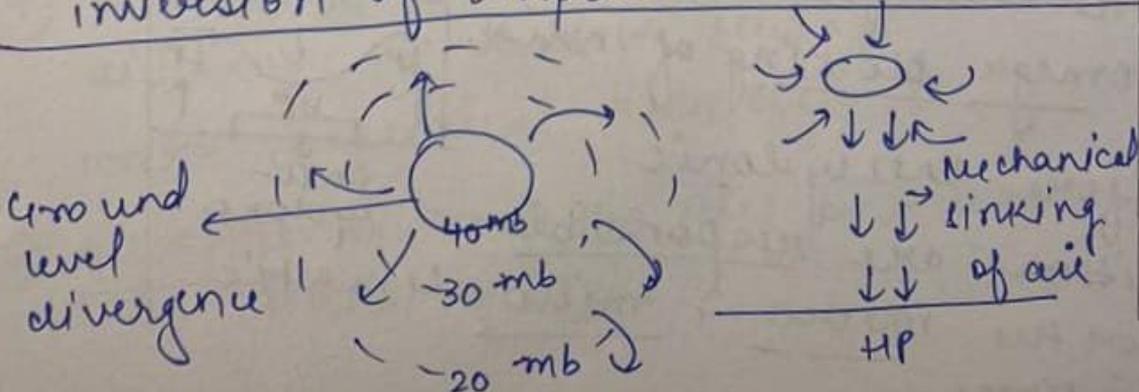
Q-4 प्रतिचक्रवाती परिसंचरण की विशेषताएँ क्या हैं और ये भारतीय उपमहाद्वीप पर मौसम को प्रतिकूल रूप से किस प्रकार प्रभावित करते हैं? (150 शब्द, 10 अंक)

What are the characteristics of anticyclonic circulations, and how do they influence weather patterns over the Indian subcontinent? (150 words, 10 marks)

Anticyclonic circulations refer to clockwise gyre of the gradient winds, rotating along a high pressure centre, marked by ground level divergence of air.

Characteristics of Anticyclonic gyre

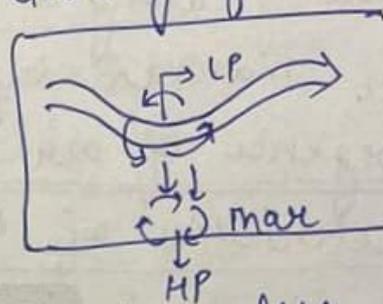
- 1) Mechanical sinking of air due to upper level convergence and pileup of air.
- 2) Air movement is clockwise in northern hemisphere and anti clockwise in southern hemisphere.
- 3) Marked by atmospheric stability due to columnar compaction and adiabatic heating.
- 4) Produces rainlessness, windlessness, inversion of temperature etc.



Influence on weather patterns of India

① creation of max desert along $25-30^{\circ}N$ due to sub-tropical westerly jet stream's trough over N-W India \Rightarrow mechanical sinking of air.

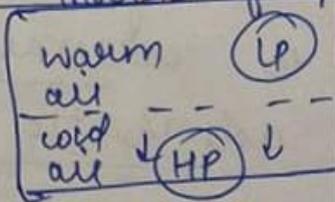
② Responsible for reversal of monsoon winds.



Eg: North-East Monsoon -

anticyclonic stable conditions due to sinking air and relatively colder surface over NW India

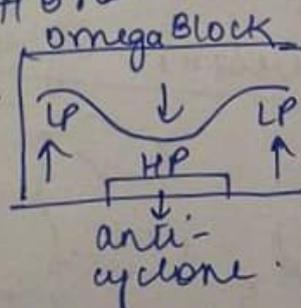
③ Inversion of temperature \Rightarrow marked by anticyclonic stable calm clear conditions as cold air is superimposed by warm air Inversion of temp



④ Droughts, heatwaves, pollution dome, Urban Heat Islands etc.

due to anticyclonic conditions.

Eg: Omega blocking of India.



Therefore, anticyclonic conditions are responsible for the macro & micro climatic variations.

Q.5 प्रवाल विरंजन क्या है और इसके मुख्य कारण क्या हैं? साथ ही, प्रवाल भित्त के संरक्षण में समुद्री संरक्षित क्षेत्रों (एम पी ए) की भूमिका का मूल्यांकन कीजिए। (150 शब्द, 10 अंक)

What is coral bleaching, and what are its main causes? Also, evaluate the role of marine protected areas (MPAs) in the conservation of coral reefs. (150 words, 10 marks)

Corals are scleractinian polyps, creating bioherms due to their symbiotic reef structures.

Coral Bleachings and Causes

Coral Bleaching refers to whitening of corals, as they expel the Zooxanthellae from their polyps, leading to loss of autotrophic algae and its colour providing capabilities.

causes

- 1) Heating of oceans - corals are sensitive to temperature changes.
- 2) Zoonotic viruses \Rightarrow invasion of coral polyps and ending the symbiotic relationship
- 3) salinity changes
- 4) Thermal & chemical pollution \Rightarrow discharge of heated sewage water, chemical run offs etc.
- 5) oil spills \Rightarrow coats the reef and leads to death of algae.

Role of marine Protected Areas

Positives

- 1) Provides sanctuaries for uninterrupted coral restoration \Rightarrow coral bleaching can reverse itself over time.
- 2) Prevention from pollution and shipping waste.
- 3) scientific application for artificial coral reef generations.
eg: mineral accretion technology.
- 4) microcosm of safe coral reefs.

Limitations

- 1) Does not tackle the global climatic marine protected areas.
- 2) Weak monitoring of implementation and mechanisms.
- 3) Ocean and reef structures have ecosystemic linkages \Rightarrow MPA's cannot be cut off from open ocean changes.

Nonetheless, coral reefs need to be conserved through methods like oxygen preservation, bio-rock etc. and high seas treaty.

- Q.6 क्षेत्रीय आर्थिक एकीकरण एवं विकास को बढ़ावा देने में आर्थिक गलियारों की भूमिका पर चर्चा करें। चेन्नई-बेंगलुरु औद्योगिक गलियारा (सी बी आई सी) जैसी परियोजनाएं भारत की व्यापक आर्थिक विकास रणनीतियों के साथ किस प्रकार संरेखित हैं? (150 शब्द, 10 अंक)

Discuss the role of economic corridors in fostering regional economic integration and development. How do projects like the Chennai-Bengaluru Industrial Corridor (CBIC) align with India's broader economic growth strategies? (150 words, 10 marks)

Economic corridors are belts of economic engines and transportation networks, that offer connectivity between different hubs of India, seamlessly integrating economic routes.

Role of Economic Corridors in Regional Development

- ① Resource - regional development
Eg: utilises local resources for economic growth.
- ② local employment generation
Eg: Amritsar - Kolkata Economic corridor \Rightarrow Tier 2 & 3 cities employment.
- ③ Reduces overdependence on centralised economic growths, of mega cities \Rightarrow decentralised

resource planning.

- ⑦ Infrastructure, urbanisation, industrialisation \Rightarrow Basic facilities like schools, water, hospitals etc.

Alignment with broader Economic strategy

- 1) Equitable development with overall economic growth -
Eg: Delhi - Mumbai corridor contributes to 2% of GDP.
 - 2) Skill development and emphasis on rural industrialisation.
 - 3) Employment generation \Rightarrow raises per capita productivity.
 - 4) Controls inflation and logistic costs due to balanced supply chain development.
Eg: Bengaluru - Mumbai corridor \Rightarrow Financial & Tech amalgamation.
- Therefore, economic corridors are the ladders through which India can ensure \$5 trillion economy, with per capita upliftment.

Q.7 ज्वालामुखीयता में शामिल प्रक्रियाओं पर चर्चा करें। साथ ही विश्व के प्रमुख ज्वालामुखी क्षेत्रों और उनसे संबंधित विवर्तनिक विन्यासों पर प्रकाश डालें। (150 शब्द, 10 अंक)

Discuss the processes involved in volcanism. Highlight the major volcanic regions in the world and their associated tectonic settings. (150 words, 10 marks)

Volcanism refers to the combined process of eruptions and the associated extensive and intensive landforms.

Processes of volcanism

- ① Generation of internal heat that drives the hot plumes \Rightarrow radio activism.
- ② Magmatic differentiation \Rightarrow separation of lighter and heavier elements.
- ③ Phreatic vapour formation \Rightarrow provides the trigger for eruption.
- ④ Lava flow \Rightarrow lahars, mud flows etc.
- ⑤ Solidification and consolidation, either within the earth (plutonic) or near the surface (hypabyssal).

Major volcanic regions & tectonic settings

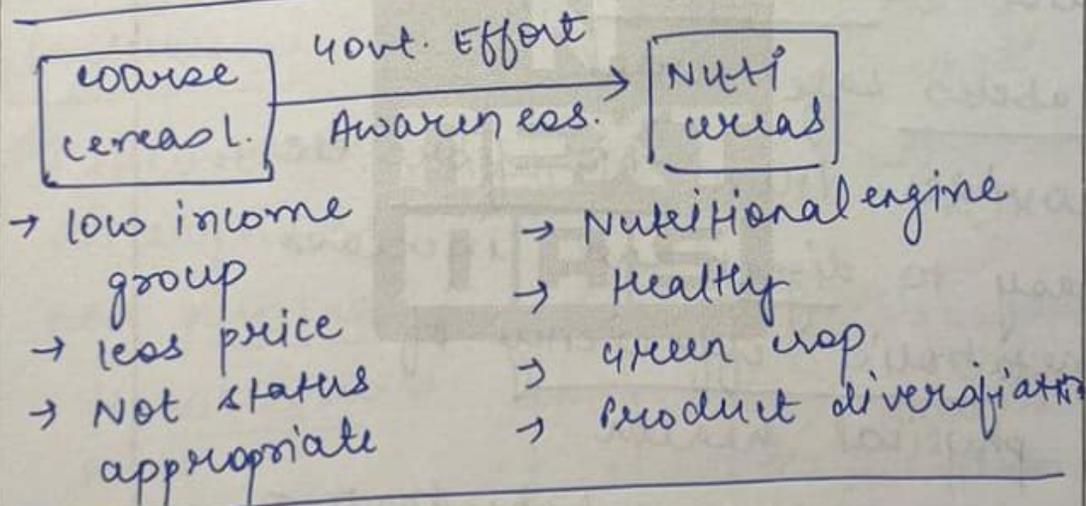


- ① Mid-Atlantic Ridge \Rightarrow divergent boundary that leads to basaltic fissure type eruption.
- ② Circumpacific Ring of Fire \Rightarrow convergent plate boundary (O-C) \Rightarrow explosive, felsic, acidic lavas.
- ③ Mid-continental Belt \Rightarrow Alpines, Ural, Apennines, Carpathians due to continent-continent convergence.
- ④ Intra-Plate volcanoes \Rightarrow due to thermal gradients.

Therefore, volcanism is an important geological process having significant lithological, climatic & hydrological consequences.

- Q.8 पहले मोटे अनाज के रूप में प्रचलित फसलों (मिलेट्स) को सरकार ने 2018 में पोषक अनाज के रूप में पुनः ब्रांड किया है। इस संदर्भ में मिलेट्स के पारिस्थितिक और पोषण संबंधी महत्व पर चर्चा कीजिए। (150 शब्द, 10 अंक)
- Earlier known as coarse cereals the government rebranded millets in 2018 as nutri-cereals. In this context discuss the ecological and nutritional significance of millets. (150 words, 10 marks)

The 'Suee Anna' of cereals, had to go through a long journey from coarse cereals to nutri-cereals, only to emerge as the hope of India's nutritional and ecological security.



Ecological significance

- 1) Hardly enough resistant crop.
- 2) Not water intensive → does not deplete ground water resources.
- 3) Suitable for semi-arid and

sub humid areas of the country.

- 4) Improves soil nutrient profile
- 5) Act as a complementary cereal for mixed cropping and farming.

Nutritional significance

- 1) Low glycemic index \Rightarrow does not raise blood pressure and diabetes safe cereal.
- 2) Provides Iron, B12, fibre etc.
- 3) Easy to digest and increase metabolic efficiency of the physical health.
- 4) Ensures low carbohydrate - high fibre diet \Rightarrow weight consciousness food products.

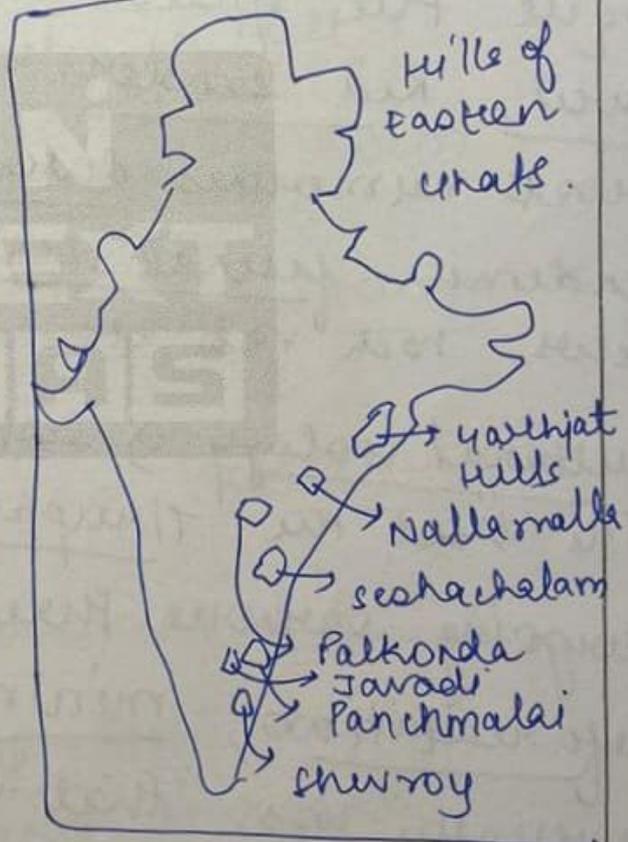
Therefore, to ensure India's agro-ecological & nutritional security, need to enhance millet based diets.

- Q.9 पूर्वी घाट की भूवैज्ञानिक विशेषताओं और पारिस्थितिक महत्व की व्याख्या करें। (150 शब्द, 10 अंक)
 Explain the geological features and ecological importance of the Eastern Ghats. (150 words, 10 marks)

Eastern Ghats are the discontiguous hills, overlooking the Bay of Bengal and presents a unique extension from the Yarichat Hills to the Kanniyakumari

Geological Features

- 1) Structurally distinguished and physically discontiguous hills.
- 2) Formed during the Proterozoic period due to collision and crustal folding.
- 3) Consists of archaen granitoid, with Nilgiri gneiss and Khondolite rocks.



Ecological significance

- 1) Important drainage channel, connecting the western ghats to Bay of Bengal.
- 2) Dry to moist dry deciduous forests, with RF - 70-90cm and unique tree species like Indian laurel, Red sanders etc.
- 3) Hosts numerous diverse and endemic faunal species. Eg: lemurs, shrews, rock rats etc.
- 4) Cultural ecology \Rightarrow Sesha Chalam hills host the Tirumala temple.
undergoing various threats like deforestation, mining, biodiversity loss, that needs to be addressed by including local communities and increasing protected area networks.

Q.10 आर्कटिक क्षेत्र की बर्फ पिघलने से जैव विविधता और पारिस्थितिकी तंत्र पर क्या संभावित परिणाम हो सकते हैं? ये परिवर्तन वैश्विक पारिस्थितिक संतुलन को किस प्रकार प्रभावित कर सकते हैं? (150 शब्द, 10 अंक)

What are the potential consequences of Arctic ice melt on biodiversity and ecosystems? How might these changes impact global ecological balance (150 words, 10 marks)

According to IPCC, the Arctic is warming 2-4 times faster than the rest of the world, leading to receding glaciers and rising sea level.

Consequences of Arctic Ice Melt on Biodiversity

- 1) Increase of sea level \Rightarrow harm to ecotonal ecosystems i.e. submergence of wetlands, swamps etc \Rightarrow habitat loss.
- 2) Borealisation and tropicalisation of species \Rightarrow poleward movement of fauna.
- 3) thawing of the Arctic due to small winters and increase in biomass productivity.
- 4) changes in temperature and salinity due to slowing down of Atlantic meridional

circulation \Rightarrow collapse of marine ecosystems.

- 5) Rising sea levels can cause coral deaths \Rightarrow loss of bioregion habitats.

Impact on Global Ecosystem Balance

- 1) Intensification of the carbon cycle due to release of C_{14} , methane hydrates due to melting cryosphere.
- 2) Extension of invasive alien species due to abrupt patterns of migration.
- 3) changes in hydrological cycle \Rightarrow due to salinity and temperature variations.
- 4) shortening and abruptness of food cycles due to phytoplankton death \Rightarrow ocean acidification.

Therefore, the Biodiversity Beyond National Jurisdiction treaty should be implemented to achieve the 30x30 goals and protect the marine and terrestrial ecosystems.

Q.11 1917 की रूस की क्रांति के साथ फ्रांस की क्रांति के लिए उत्सर्दयी कारकों की तुलना कीजिये तथा अन्तर बताइए। वैश्विक राजनीतिक विचारधाराओं पर उनके प्रभाव के संदर्भ में इन क्रांतियों की प्रकृति और परिणाम किस प्रकार भिन्न थे? (250 शब्द, 15 अंक)

Compare and contrast the factors that led to the French Revolution with the Russian Revolution of 1917. How did the nature and outcomes of these revolutions differ in terms of their impact on global political ideologies? (250 words, 15 marks)

French and Russian Revolutions of 18th and 20th century, were similar, yet different in their factors, impacts and ideologies.

Similarity of Factors

1) Reaction against monarchical fallacies.

Eg: French Revolution → against automatic regime of Louis XVI

Russian Revolution → Tsar Nicholas II.

2) led by masses and feelings of nationalism ⇒ liberty, equality and fraternity.

3) Emergence of automatic leaders like Napoleon Bonaparte and Stalin and Lenin.

4) Result of violent rigours.
Eg: Fall of Bastille; and the Sunday Killings (October Revolution).

Differences in factors, impacts and ideologies

Dimension	French Revolution	Russian Revolution
Factors	<p>① <u>monarchical constitutional structure</u>. Eg: Estates General</p> <p>② Revolution was led by <u>peasants</u> ⇒ <u>agrarian dissatisfaction</u></p> <p>③ Emergence of <u>worker clubs</u> like <u> Girondins </u> and <u>Jacobins</u>.</p>	<p>① <u>complete overhaul of monarchy</u>. Eg: <u>Bolshevik party</u>.</p> <p>② mainly led by <u>workers</u> and <u>employees of cities</u>.</p> <p>③ Emergence of parties like <u>Red shirts</u>.</p>
Impacts & ideologies	<p>① spurred <u>nationalist movements</u>. Eg: <u>unification of Germany</u> and <u>Italy</u>.</p> <p>② Gave the idea of</p>	<p>① spurred <u>decolonisation movements</u>. Eg: <u>Revolutionaries of India</u></p> <p>② Promotion of <u>totalitarian</u></p>

Constitutional governments.

③ Presented the idea of liberty, equality and fraternity.

④ Have the ideals of liberal democratic regimes

Socialism.

③ Focussed more on equality and equal ownership of resources.

④ Idea of communist governments with full state control.

Therefore, despite its differences in outcomes, both the french and american revolutions proved to be watshed moments, that changed the course of history.

Q.12 1975 में भारत में आपातकाल लागू करने के कारणों और परिणामों का विश्लेषण कीजिए। इस अवधि ने स्वतंत्रता भारत में लोकतांत्रिक ढांचे और नागरिक स्वतंत्रता को किस प्रकार प्रभावित किया है ? (250 शब्द, 15 अंक)

Analyze the causes and consequences of the imposition of Emergency in India in 1975. How did this period impact the democratic framework and civil liberties in post-independent India?

(250 words, 15 marks)

On 25th June 1975, the darkest hour of Indian constitution began with the imposition of internal emergency, by the then government.

Causes of Emergency

- ① Bangladesh War of 1971 ⇒ accelerated the economic hardships and inflation.
- ② Oil crisis of 1973 triggered by Yom Kippur war ⇒ surge in import bills ⇒ inflation.
- ③ Droughts of 1972-73 ⇒ food supply issues ⇒ shortages of essential products.
- ④ Student protests in Gujarat and Bihar.
- ⑤ Worker's strikes due to delays of slaves and poor working

conditions. Eg: Railway strikes.

- ⑥ Political turmoil and Allahabad court judgement. \Rightarrow barring of Indira Gandhi's election.

Consequences of Emergency

- ① suspension of civil liberties and fundamental rights.
- ② Political opponents were jailed
Eg: reference of India Act and MISA act.
- ③ Centralisation of power \Rightarrow suspension of state government and federal structure.
- ④ Forced sterilisations and misuse of office.
- ⑤ committed judiciary \Rightarrow could not protect against excesses of executive.

Impacts on Democratic Framework and civil liberties

- ① Constitution amendments like

38th, 42nd Act ⇒ suspension of fundamental rights, and writ jurisdiction.

② censorship of free media ⇒ freedom of speech and expression was curtailed.

③ Police excesses, custodial tortures etc. especially of political opponents.

However, the emergency also strengthened the idea of civil liberties.

① 44th Amendment act ⇒ armed rebellion, written recom. of cabinet ⇒ stringent emergency imposition.

② Restored the freedom of judiciary and strengthened separation of powers ⇒ eg. evolution of collegium system.

③ Formation of democratic alliances.
eg. grand coalition.

Therefore, the emergency period is still a blotch on India's democratic history, but it strengthened our polity.

Q.13 स्थानीय पवनों के निर्माण में कौन से कारक सहायक होते हैं? प्रासंगिक उदाहरण प्रस्तुत करते हुए, विभिन्न क्षेत्रों में मौसम और जलवायु पर उनके प्रभावों की चर्चा कीजिए। (250 शब्द, 15 अंक)

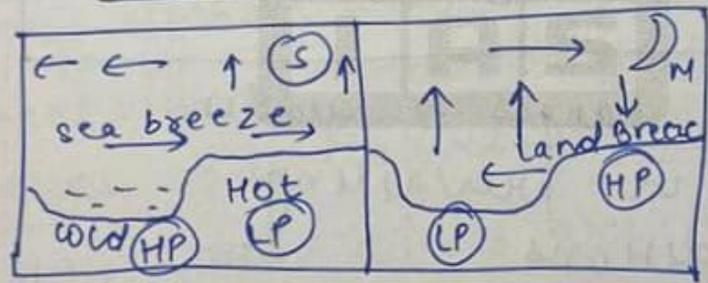
What are the factors that lead to the formation of local winds? Discuss their impact on the weather and climate in various regions, providing relevant examples. (250 words, 15 marks)

Local winds are tertiary, temporary, localised air movements, influenced by topography, maritime and climotological factors.

Factors leading to local winds

1) Pressure differentials between land and sea.

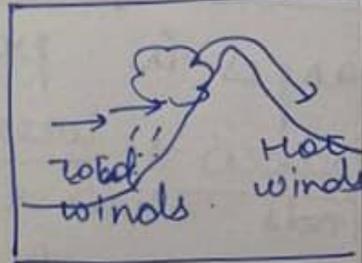
Eg: land breeze and sea breeze.

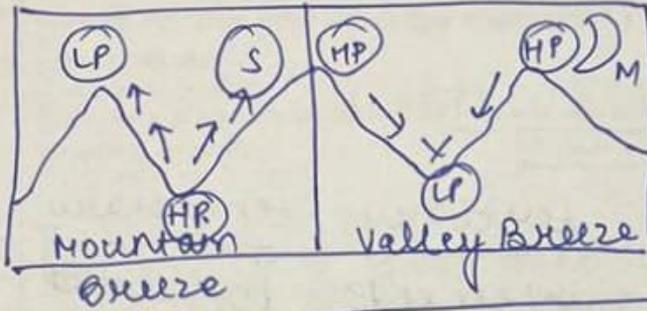


2) orographic barriers ⇒ lifting and sinking of air, causing localised impacts.

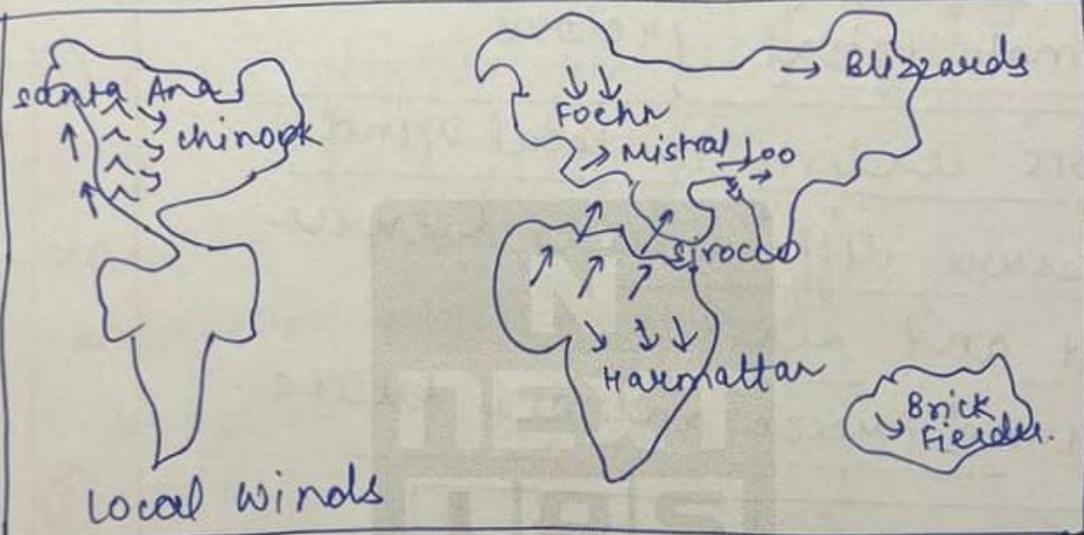
Eg: leeward and windward winds.

3) Altitudinal variations ⇒ provides anabatic and katabatic winds.





Impact on weather and climate



① Temperature changes ⇒ sudden fluctuations in prevailing weather conditions.

Eg: Chinook (warm wind) descends from Rockies mountain and raises the winter temperature of prairies by 5°C.

② Changes in precipitation conditions.

Eg: Sirocco ⇒ less and moisture loaded winds blow across the Mediterranean to cause 'blood rain' along

Adriatic coast.

③ changes in humidity levels \Rightarrow alters the relative humidity.

Eg: Harmattan 'doctor winds' brings pleasant dryness to the humid equatorial Africa.

\rightarrow loo causes dust storms, heatwaves across the Indo-European plain.

④ Responsible for extreme weather conditions like heatwaves and

coldwaves.

Eg: dry offshore hot 'santa Ana' \Rightarrow heatwaves across californian coast; Boreas \Rightarrow coldwaves in siberia.

Therefore, local winds are important weather regulators, with its

frequency and impacts amplifying due to altered primary circulations and global warming.

Q.14 बेंगलूर और हैदराबाद जैसे महानगरों में ताजे जल की कमी के प्रमुख कारण क्या हैं? शहरी जल प्रबंधन की आपूर्ति और मांग दोनों पहलुओं को संबोधित करने वाले व्यापक समाधान सुझाएँ। (250 शब्द, 15 अंक)

What are the primary drivers of freshwater scarcity in megacities like Bangalore and Hyderabad? Suggest comprehensive solutions that address both supply and demand aspects of urban water management. (250 words, 15 marks)

India supports 18% of world population, with 3% of the land surface and 4% of the world's water resources, creating significant demand-supply mismatches.

Primary drivers of freshwater scarcity

- 1) scarcity of freshwater availability due to limited resources and surgeoning population. eg: mega cities \Rightarrow 10 crore + population.
- 2) altered precipitation patterns due to global warming and climate change \Rightarrow eg: Droughts in Bangalore during rainy period.
- 3) increased runoff and lack of natural storage for rainwater.
eg: According to NASA, with 1% rice in impervious surfaces, penetration declines by 3.3%.

- 4) privatisation of freshwater sources by mafias and gangs \Rightarrow monopolisation of water distribution.
- 5) Lack of comprehensive water budgets by the municipal corporations.
- 6) Wastage of water by households, industries etc.
- 7) Pollution of the existing ground and surface water.
Eg: Fluoride levels are extremely high in Kolkata, Hyderabad etc.

Comprehensive solutions to water management

(A) Supply side

- 1) Increasing watershed management by addressing ground and surface water resources comprehensively.
- 2) Increasing green cover in cities to improve soil moisture and groundwater recharge.
- 3) Construction of rainwater harvesting pits, aquifers, dams

over terraces, building parks etc.

4) Resolving inter-state water disputes by basin level planning. Eg: Kaveri dispute between Chennai & Bangalore

5) comprehensive capacity building of municipals to identify, assess, manage and distribute water.

(B) Demand-side

1) Water cess should be charged after free allocation of minimum quota.

2) localised management of residential complexes \Rightarrow incentives on generation of excess supply through rain water harvesting systems.

3) strict monitoring of wastage of fresh water \Rightarrow finer and penalties.

4) water policies should be taught at school level to manage and conserve water.

5) cultivation of awareness regarding recycling of water.

Therefore, water is a key precious resource, and megacities need to amp up their efforts to ensure SDG-8.

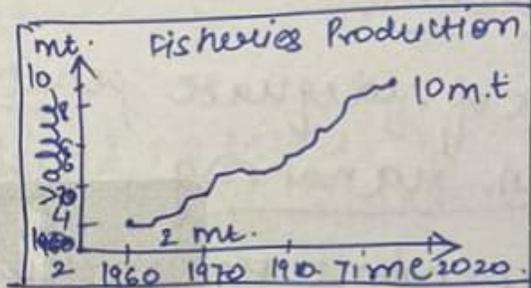
Q.15 नीली क्रांति क्या है? जलीयकृषि (एक्वाकल्चर) के विकास में महत्वपूर्ण बाधाएँ क्या हैं, तथा उन्हें दूर करने के लिए कौन सी व्यापक रणनीतियाँ लागू की जा सकती हैं? (250 शब्द, 15 अंक)

What is Blue Revolution? What are the significant hurdles in aquaculture development, and what comprehensive strategies can be implemented to address them? (250 words, 15 marks)

Blue Revolution is the dramatic rise of fisheries and marine products, in terms of volume, value, exports and contribution to GDP.

Characteristics of Blue Revolution

1) Increase in aquaculture and marine farming.



→ India:
 - 2nd largest aquaculture prod.
 - 3rd largest fisheries prod.
 - 4th largest exporter of marine products.

2) Increase in the income of coastal farmers, fishermen etc.

3) Use of R&D, science and technology to increase the production.

4) Govt. support in terms of loans, equipments etc.

Eg: Kisan Matsya Sampada Yojana

5) Creation of institutional infrastructure. Eg: 1960's - National

fisheries development boards.

Hurdles of Aquaculture development

- 1) low levels of awareness, education and aptitude of the coastal communities for scientific management of produce.
- 2) lack of adequate penetration of ocean ranching, fish farming etc.
 ⇒ dependent on ancient methods of fish catching.
- 3) lack of exploration of high value marine superfoods. Eg: kelp.
- 4) sustainability issues of marine and inland aquaculture ⇒ mechanised trawlers, commercial fishing etc.
- 5) lack of market diversification, food processing infrastructure and coastal farming post-harvest extension linkage ⇒ cold storages etc.

- Q.16 भारत में बड़े पैमाने पर सौर फार्मों की स्थापना को प्रभावित करने वाले प्रमुख कारक क्या हैं, और उनके पर्यावरणीय और सामाजिक प्रभाव क्या हैं? भारत जैव विविधता और स्थानीय पारिस्थितिकी तंत्र को रखा की आवश्यकता के साथ सौर ऊर्जा के विस्तार को किस प्रकार संतुलित कर सकता है? (250 शब्द, 15 अंक)

What are the key factors influencing the establishment of large-scale solar farms in India, and what are their environmental and social impacts? How can India balance the expansion of solar energy with the need to protect biodiversity and local ecosystems? (250 words, 15 marks)

At present, India has installed 82GW of solar energy, with nearly 20% of share in energy mix. Solar energy refers to the conversion of heat energy to electrical energy by solar photovoltaics and thermal technology.

Factors influencing large-scale solar farms

- Nearly 40 GW of energy is produced by 10 large solar farms (MNRE).
- 1) Availability of land ⇒ solar farms require more than 50Ha land area ⇒ shortage of such large-scale contiguous availability.
 - 2) Fluctuations of solar power potential ⇒ specific geographic requirements.
Eg: Rajasthan and Gujarat account for 30% of total solar

energy produced.

3) land acquisition and tribal rights displacement.

4) Ecological sustainability. Eg: installation of solar \Rightarrow death of Kori Bustards in Desert National Park.

Environmental and social Impacts

(A) Environmental

- 1) Generation of clean energy.
- 2) Economies of scale in terms of ecological coverage and installation costs.
- 3) Decentralised energy production \Rightarrow grid transfers \Rightarrow decarbonisation.
- 4) Environmental waste and threats to biodiversity.

(B) social

- 1) universal electrification, especially in remote tribal regions.
- 2) Decrease in respiratory diseases, especially among women.
Eg: use of electric solar cookers.
- 3) large-scale solar farms \Rightarrow tribal displacement.

5) Widespread deforestation in saved groves to install solar panels.

Balancing the Solar Expansion and Local Ecosystem Protection

1) Creation of mini solar parks instead of large-scale \Rightarrow decentralised, reliable production.

2) Focus on rooftop solar instead of large-scale plants : Eg: PM-KUST Billi Surge Unit.

\rightarrow democratised access to clean energy

\rightarrow rural electrification

\rightarrow NO harms to biodiversity \Rightarrow no deforestation

\rightarrow NO need for acquisition of large areas \Rightarrow NO tribal displacement.

3) Water-based floating solar parks.
Eg: Ramagundam.

\rightarrow high energy density

\rightarrow NO artificial cooling required \Rightarrow less water use and wastage.

\rightarrow NO requirement for terrestrial areas
 \Rightarrow NO harm to biodiversity.

Therefore, solar is the torchbearer for India to meet its Panchamrit goals and ensure universal electrification.

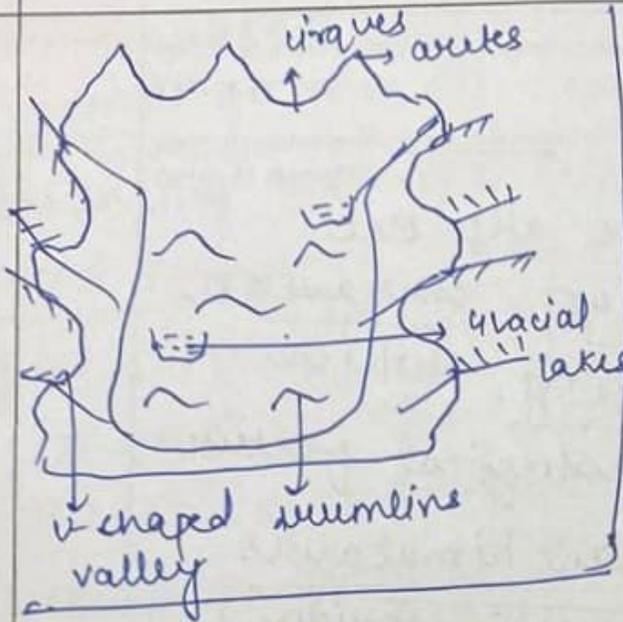
- Q.17 भारतीय हिमालय में निर्मित होने वाली विभिन्न प्रकार की हिमनद भू-आकृतियों कौन सी हैं? ये भू-आकृतियाँ स्थानीय पारिस्थितिकी तंत्र और मानवीय गतिविधियों को किस प्रकार प्रभावित करती हैं? (250 शब्द, 15 अंक)

What are the various types of glacial landforms formed in the Indian Himalayas? How do these features impact local ecosystems and human activities? (250 words, 15 marks)

Glacial landforms are the result of corrosion, corrasion, abrasion and tugging, which leads to distinct geological features, as seen in the Indian Himalayas.

Types of glacial landforms in Indian Himalayas

- ① cirques and ridges ⇒ 'V' shaped depression that leads to accumulation of water ⇒ glacial lakes.
- ② correlated Arêtes ⇒ the coalescence of cirque tips forms convex, steep, pointed, saw-toothed ridges.
- ③ V-shaped valleys ⇒ as the base of glacier erodes the valley floor.
- ④ Hanging valleys ⇒ due to the streams of glaciers valley within valley!
- ⑤ Dumplings and moraines - formed due to deposition of glacial tillite and boulders etc.



Impact on local Ecosystem

- 1) Distinct glacial ecosystems
Eg: Tundra, lichens, mosses etc.
- 2) Permafrost \Rightarrow captures CO₂ and

methane hydrates

- 3) Provision of freshwater downstream to ensure sustainability of rivers.
- 4) Himalayan fauna \Rightarrow Eg: Himalayan brown bear, snow leopard etc.

Impact on Human activities

- 1) glaciers of Himalayas \Rightarrow water Towers of Asia \Rightarrow Feeds 10 largest rivers of Asia.
- 2) Tourism \Rightarrow Himalayan states attract nearly \$71.5 million revenue through tourism.
- 3) climatic evidence for research and evolution of biodiversity and continents. Eg: marine fossil

at Himalayas.

4) cultural significance. Eg: Amarnath, Patni Top, Churdwara, Kedarnath etc.

5) disasters \Rightarrow Glacial lake outburst floods, floods in rivers, avalanches, etc.

Eg: Lhonak lake GLOF, Sikkim, Amarnath cloud burst etc.

6) Melting of Himalayan glaciers due to global warming \Rightarrow erratic patterns of monsoon, release of GHG's etc.

7) defense \Rightarrow northern shield against China & Pakistan.

Eg: Siachen glacier \Rightarrow Highest battle field in the world.

Therefore, glaciers of Himalayas are of acute significance, and there is a need to increase the conservation efforts, through sustainable planning.

Q.18 हिंद महासागर की अद्वितीय भौगोलिक विशेषताओं और वैश्विक महासागरीय परिसंचरण प्रतिरूप पर उनके प्रभावों की चर्चा कीजिए। ये विशेषताएँ भारतीय उपमहाद्वीप को जलवायु को किस प्रकार प्रभावित करती हैं? (250 शब्द, 15 अंक)

Discuss the unique geographical features of the Indian Ocean and their impact on global oceanic circulation patterns. How do these features influence the climate of the Indian subcontinent? (250 words, 15 marks)

Indian ocean is the 3rd largest ocean, bounded by the African, Arabian, Indian subcontinent and the Australian landmasses.

Geographical Features of Indian Ocean

- 1) Central Indian ocean ridge, that extends from Chagos - Laccadive islands, towards the Antarctica.
- 2) Coral atolls in Maldives, Lakshwadeep, Mauritius etc.
- 3) Trenches and wedges due to the sinking of the tethys plate, beneath the Eurasian plate.
- 4) Basaltic plains found in the Abysso-Hadal zone.
- 5) sea mounts, guyots, molls etc.
Eg: Nikitin sea mount.

Impact on Global Oceanic Patterns

- 1) Influences the current and wave

2) continental shelves width \Rightarrow influences the tidal patterns.

Eg: Arabian sea shelf \Rightarrow Narrower \Rightarrow deep inlets and bays

Bay of Bengal shelf \Rightarrow wider \Rightarrow lagoons
Eg: Chilika lake

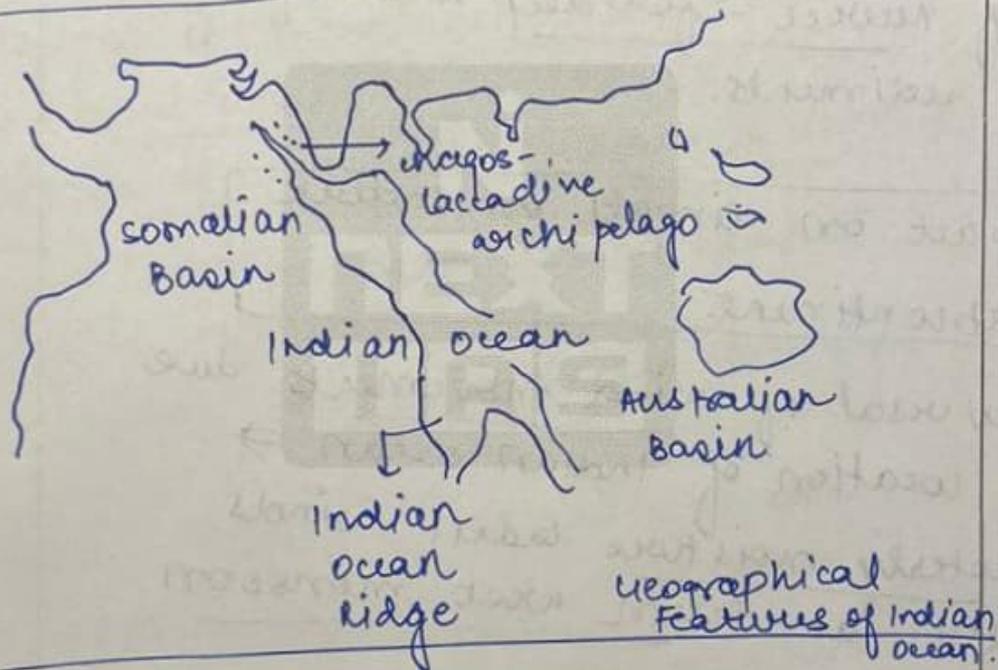
3) Trench wedge has led to formation of murice - fore deep and deposition of sediments.

Impact on climate on Indian subcontinent

1) Reversal of wind movements due to location of Indian ocean \Rightarrow westerly moisture laden winds enter as south west monsoon.

2) Formation of tropical cyclones due to sahayadri trough and closed nature of Arabian sea \Rightarrow high salinity and evaporation.

- 3) Local atolls of Laccadive archipelago \Rightarrow site of tourism and geo-strategic significance.
- 4) Reversal of ocean currents due to structural configuration of Indian ocean.



Therefore, realising the significance of Indian ocean, India has joined multilateral fora like BIMSTEC, IONS, IONA, to ensure the continuation of free and open sea lanes of communication, and mitigating the impacts of climate change of Indian ocean.

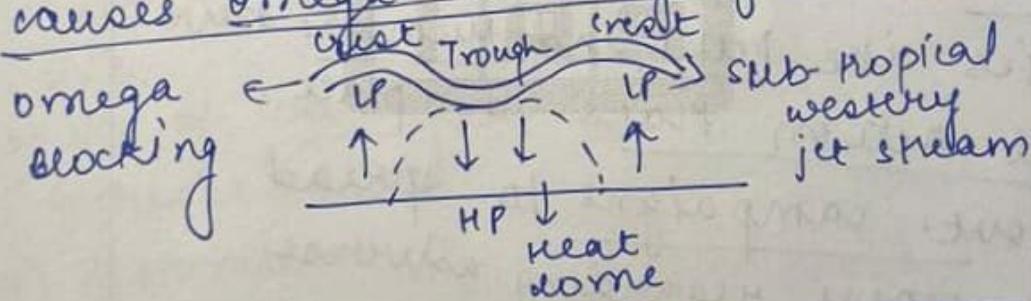
- Q.19 शहरी ऊष्मा द्वीप (UHI) भारतीय शहरों में एक महत्वपूर्ण परिघटना बन गई है, जो ग्रियम लहरों (हीट वेव्स) की आवृत्ति और तीव्रता को बढ़ावा दे रही हैं। इस परिघटना में योगदान देने वाले अंतर्निहित कारकों का विश्लेषण कीजिए और मौजूदा शमन रणनीतियों का आलोचनात्मक मूल्यांकन कीजिए। (250 शब्द, 15 अंक)

Urban heat islands (UHIs) have become a significant phenomenon in Indian cities, exacerbating the frequency and intensity of heat waves. Analyze the underlying factors contributing to this phenomenon and critically assess the existing mitigation strategies. (250 words, 15 marks)

Urban Heat Islands refers to the heat dome above urban areas, marked by high temperatures ($2-3^{\circ}\text{C}$ \uparrow than surrounding), high pressure and rainlessness.

Factors contributing to formation of urban heat islands

- 1) stagnation of jet streams, which causes omega blocking of troughs.



- 2) human volcanoes \Rightarrow dust, greenhouse gases, pollutants, aerosols etc, due to dark colour, reduces albedo and increased trapping of the heat.

- 3) concretionary structures reduces albedo, and green cover \Rightarrow reduced

evapotranspiration \Rightarrow less cloud formation
 \Rightarrow atmospheric stability and
anticyclonic condition.

4) loss of soil moisture reduces the
cooling effect as the latent heat
of evaporation is not dissipated
into the atmosphere \Rightarrow warm and
oppressive.

Critical Assessment of Mitigation strategies

Positives

- 1) cities like Delhi and Mumbai have
Heat Action Plans in place.
- 2) Govt. campaigns to spread
awareness regarding adverse
effects, mitigations etc.
- 3) Research and development of
green cement, water guns etc. to
reduce the trapping of heat.

Negatives

- 1) Reactive in nature \Rightarrow temporary

management.

- 2) lack of adequate and affordable beds in hospitals to deal with heat emergencies \Rightarrow death of 55 people due to Delhi heatwaves (2024).
- 3) continued release of GHG emissions, cities contributing nearly 70% of emissions.

Way forward.

- 1) Afforestation and urban reclamation to create green spaces. Eg: vertical trees, riyawaki method.
- 2) Decarbonisation of transport sectors \Rightarrow metros, hydrogen fuel cells, EV's.
- 3) Use of green-blue infrastructure to increase albedo.
- 4) Restoration of wetlands, swamps, city lakes \Rightarrow to assist cloud formation.
- 5) Early warning systems and awareness campaigns.

Therefore, with breach of 1.5°C, heatwaves and VHI will become more common, there is a need for suitable long-term & short-term mitigation and adaptation.

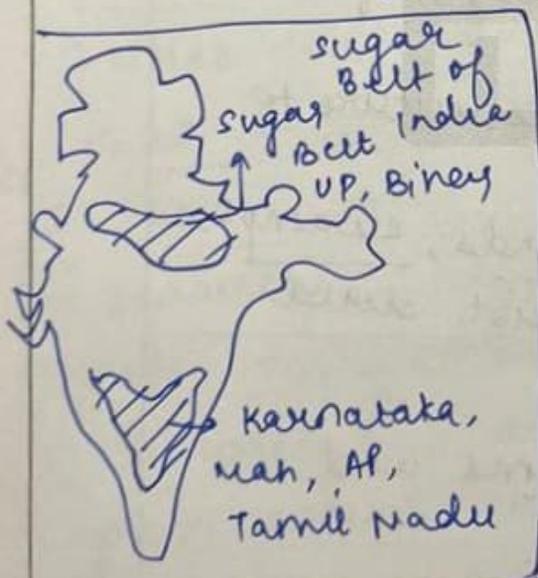
Q.20

उत्तर भारत और प्रायद्वीपीय भारत के मध्य चीनी उद्योग में क्षेत्रीय असमानताओं में योगदान देने वाले प्राथमिक कारकों का मूल्यांकन कीजिए। अधिशेष चीनी उत्पादन को कम करने के लिए क्या उपाय किए जा सकते हैं? (250 शब्द, 15 अंक)

Evaluate the primary factors contributing to regional disparities in the sugar industry between North India and Peninsular India. What measures can be undertaken to reduce the surplus sugar production? (250 words, 15 marks)

India has emerged as the largest producer and exporter of sugar industry, surpassing Brazil. sugar contributes to a labour-intensive industry, with several channels of diversification.

Primary Factors of regional disparity between sugar industry of North & South



The sugar mills of peninsular India are performing better than sugar mills of northern India:

- 1) Tropical climate of peninsula is more conducive to sugar cultivation.

- 2) Higher sucrose content \Rightarrow more sugar extraction, as well as

energy density.

- ③ longer crushing period \Rightarrow greater extraction and lesser cost.
- ④ lesser population density than the UP-Bihar Belt \Rightarrow greater number of industries and mills.
- ⑤ Better transportation and logistics infrastructure in south \Rightarrow faster and cheaper transportation.

Measures to reduce surplus sugar production

1) According to Ranganath Mishra committee report, sugar production should be regulated:

- a) Focus on Bagasse-based energy production \Rightarrow ethanol \Rightarrow decarbonation & absorption of excess produce.
- b) 2nd generation biofuels to aid in the green energy production

- c) Reduction of Fair and Remunerative price to sugar industries.
- d) Food processing \Rightarrow use of surplus sugar in jams, cookies etc. \Rightarrow Farm to factory model.
- e) Diversification of sugar export markets.

Therefore, sugar production can be a major thrust for India's Panchsheel goals, food security and reducing the current account deficit.