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GENERAL STUDIES (TEST CODE : 1330)

Name of Candidate	ANIL BASAK		
Medium Eng./Hindi	Eng.	Registration Number	28487
Center		Date	28/07/19.

INDEX TABLE

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	
11	15	
12	15	
13	15	
14	15	
15	15	
16	15	
17	15	
18	15	
19	15	
20	15	

Total Marks Obtained:

Remarks:

INSTRUCTIONS

1. Do furnish the appropriate details in the answer sheet (viz. Name, Registration Number and Test Code).
उत्तर पुस्तिका में सूचनाएं भरना आवश्यक है (नाम, प्रश्न-पत्र कोड, विद्यार्थी क्रमांक आदि)।
2. There are **TWENTY** questions printed in **ENGLISH & HINDI** इसमें बीस प्रश्न हैं अंग्रेजी और हिन्दी में छपे हैं।
3. **All questions are compulsory.**
सभी प्रश्न अनिवार्य हैं।
4. The number of marks carried by a question/part is indicated against it.
प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।
5. 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. No marks will be given for answers written in medium other than the authorized one.
प्रश्नों के उत्तर उसी माध्यम में लिखे जाने चाहिए जिसका उल्लेख आपके प्रवेश पत्र में किया गया है और उस माध्यम का स्पष्ट उल्लेख प्रश्न-सह-उत्तर (क्यूसीए) पुस्तिका के मुख्य पृष्ठ पर अंकित निर्दिष्ट स्थान पर किया जाना चाहिए। उल्लिखित माध्यम के अतिरिक्त अन्य किसी माध्यम में लिए गए उत्तर पर कोई अंक नहीं मिलेंगे।
6. Word limit in questions, if specified, should be adhered to.
प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।
7. Any page or portion of the page left blank in the Question-Cum-Answer Booklet must be clearly struck off.
उत्तर पुस्तिका में खाली छोड़ा हुआ पृष्ठ या उसके अंश को स्पष्ट रूप से काट दिया जाना चाहिए।

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Delhi- 110009

EVALUATION INDICATORS

1. Contextual Competence
2. Content Competence
3. Language Competence
4. Introduction Competence
5. Structure - Presentation Competence
6. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

4.

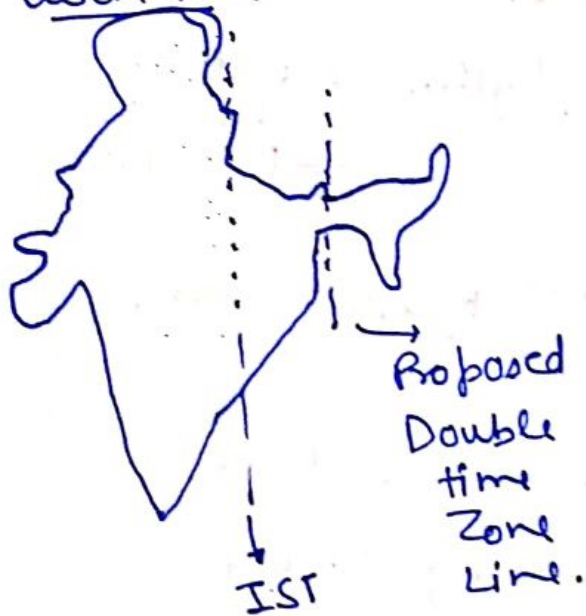
5.

6.

1. Assess the feasibility of introducing two time zones in India in the wake of recent proposal made by Council of Scientific and Industrial Research (CSIR). (150 words) 10

वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद (CSIR) के हालिया प्रस्ताव के आलोक में भारत में दो टाइम ज़ोन लागू करने की व्यवहार्यता का मूल्यांकन कीजिए।

Currently, India is having single
time zone determined from
IST Meridian at roughly 82.5°E
which is 4.5 hours ahead of Green-
wich time



Proposal of CSIR

- Two time
Zone separated
by Meridian
passing
through Chicken
Neck Region

Implication

- NE Region will have 1 hour
period advanced from Rest of
India

Is it First time?

No, we have similar ^{two} time zone in British India - known as Chaibagan time

Benefits

- Daylight time saving in NE
- More working hours for NE
- Less electricity costs.
- Natural Circadian rhythm ⇒ Better health of NE citizen

Negative Consequences

- Further alienate NE Region from Rest of India
- Railways, Post etc. will have difficulty to continuously change timings

Thus, two time zones are quite feasible by economic point of view for NE region but care should be taken for public utility service adjustment

2. Mention the conditions responsible for occurrence of Temperature Inversion in atmosphere. Elaborating on its various types, highlight its effects on the biosphere. (150 words) 10

वायुमंडल में तापमान व्युत्क्रमण की घटना हेतु उत्तरदायी परिस्थितियों का उल्लेख कीजिए। इसके विभिन्न प्रकारों का सविस्तार वर्णन करते हुए, इसके द्वारा जैवमंडल पर पड़ने वाले प्रभावों पर प्रकाश डालिए।

Temperature inversion is characterized by increase in temperature with height as contrast to normal decrease in temp. with height.

Conditions

→ Less vertical air disturbance.

→ Cold Nights

For eg - In Vallies & Mountains, Hot Air engulf (in morning by sun) Cold air in cold nights in valley.



→ Pollution & Smog in Cities.

For eg - due to vehicular population the thick smog in cold nights not able to escape upwards.

Effects on biosphere

- It prevents freezing of Montaneous vegetation, thus increasing productivity.
- While Vally people suffer from heightened cold.
- In cities, smog lead to reduce visibility & cause respiratory problem
For eg - The Great Inversion of London in 1970's.
- Disruption of normal temperature trend effect atmospheric ecosystem.

Thus, temp. inversion in cities is undesirable while it do have some trve effects in Mountain-Vally System.

3. Identify different factors that trigger Glacial Lake Outburst Floods. Also, suggest certain measures that need to be taken to minimize their impact.

(150 words) 10

उन विभिन्न कारकों की पहचान कीजिए जो हिमनदीय झील प्रस्फोट जनित बाढ़ (ग्लेशियल लेक आउटबर्स्ट फ्लड) को प्रेरित करते हैं। साथ ही, इनके प्रभावों को न्यून करने हेतु किए जाने वाले कुछ आवश्यक उपायों का भी सुझाव दीजिए।

Glacial Lake Outburst Floods (GLOFs) are sudden flash floods observed in Mountainous region due to release of water ~~for~~ stored in lakes.

Why?

- Climate Change - More snow melting $\Rightarrow$ Capacity of lake is breached.
- Mining - Create disturbances in downward hills $\Rightarrow$ vibration cause breakage of bunds of lakes
- Earthquake - Tremors disturb the stone boundaries of lakes.
- Wind Erosion - eroding boundary Material

→ Human Activity Intensity - in sloppy Mountain regions is dangerous.

Measures to Minimize

Preventive Measures

- Renewable energy source use to limit global temp. rise by 1.5°C as per IPCC report
- Mining activity should not be done in sensitive Himalayas.
- Less Human activity intensity

Mitigation

- Early Warning of earthquake & tremors
- Side Reservoir creation
- Bunds & Terraces to prevent fast outflow.
- Human & Economic loss caused by GLOFs is huge & it should be properly managed for prosperity of hilly areas

4. What is palaeomagnetism? Explain how it serves as a bridging evidence for Plate Tectonics Theory. (150 words) 10

पुराचुम्बकत्व क्या है? व्याख्या कीजिए कि यह किस प्रकार प्लेट विवर्तनिकी सिद्धांत के प्रमाण हेतु एक सेतु के रूप में कार्य करता है।

Palaeomagnetism refers to the earth's permanent magnetic character due to movement of liquid outer core of ferrous particles. It keeps on changing its direction in centuries time period.

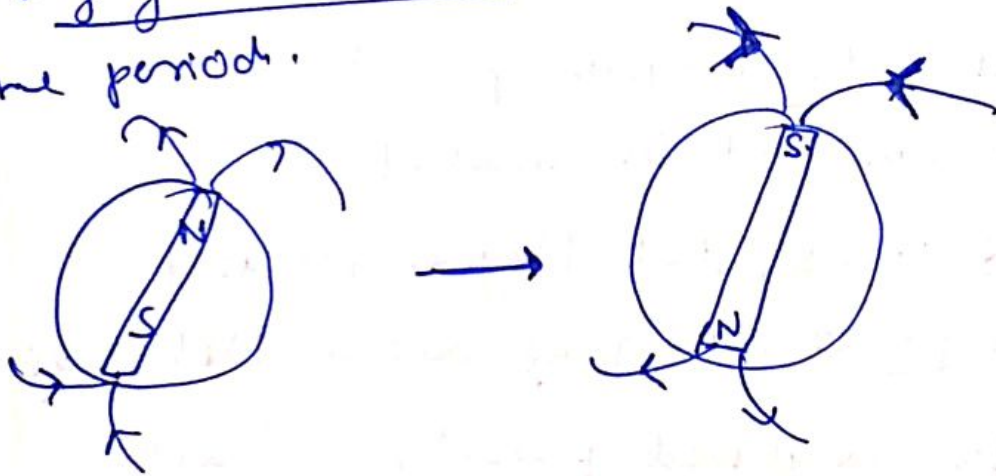
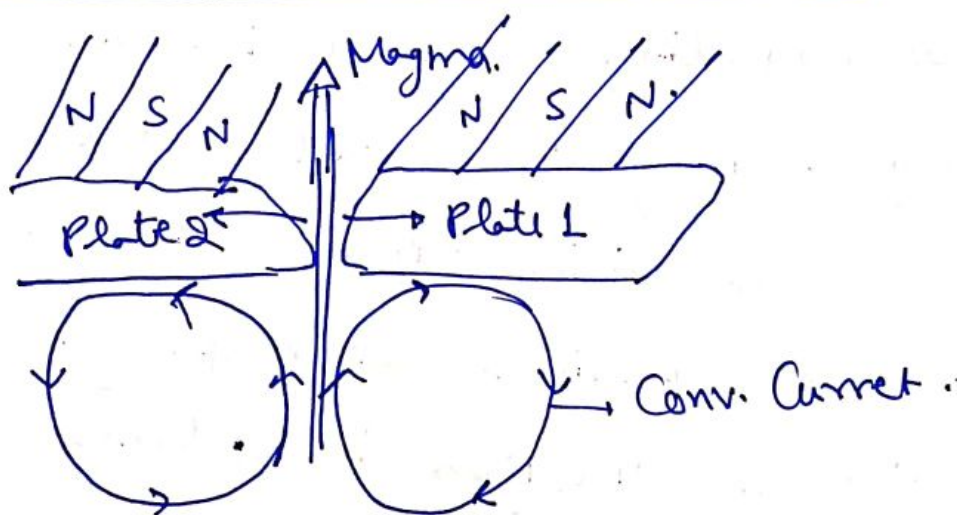


Plate tectonic theory states that earth is divided in several mobile layers which keep on moving on semi-molten asthenosphere. It is due to convectional currents present in asthenosphere.

How Paleomagnetism Confirm Plate Tectonics ?



- Alternate Magnetic polarity layers are observed in seabed
- This shows, that Magma released from plate divergence along Mid-Oceanic Ridge acquired polarity of earth at that time period.
- Alternate polarity shows, plates are continuously moving with continuous magma eruption.

This proves Plate Tectonics theory of continent & Ocean distribution & landform formation & destruction.

5. With adequate examples, explain how ocean currents influence the formation of fishing grounds across the world. (150 words) 10

यथोचित उदाहरणों के साथ, व्याख्या कीजिए कि किस प्रकार महासागरीय धाराएं विश्व भर में मत्स्यन क्षेत्रों के निर्माण को प्रभावित करती हैं।

Ocean currents are large mass of ocean water moving at large speeds in a definite direction for large period of time.

Why? — due to thermal differences btw poles & equator & local winds & Coriolis force.

Foreg - Warm Currents - Equatorial C, Gulf Stream, Alaska.

Cold Currents - Humboldt, Benguela, Labrador

How Influence Fishing?

→ Offshore currents led to upwelling of nutritious water & thus lead to increased fish production

Eg - Peru Coast by offshore Equatorial Current.

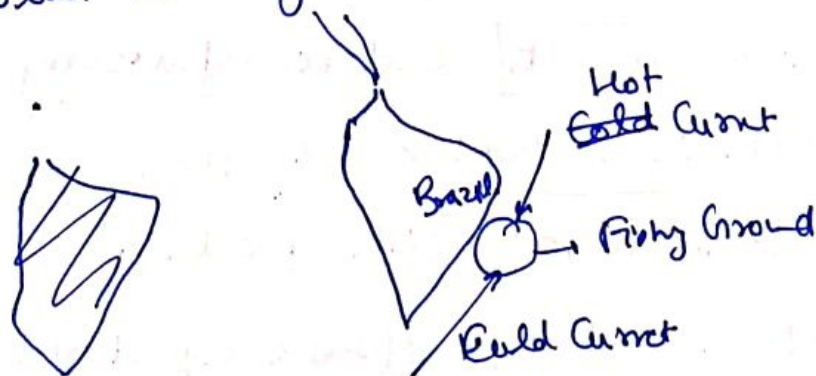
→ Heat Distribution - prevent subfreezing temp. in polar region & thus normal temperature for fish metabolism is maintained.

→ Mixing of Cold & Hot Currents lead to oxygen concentration increment in water & these areas are one with highest fish production.

Eg - Brazil (Humboldt) & Equatorial
Atlantic Current).

Japan (Oyashio & Kuro
Current Mixing).

Thus, Ocean current effect fish economy & Blue economy to a large scale.



6. Discussing the reasons behind disappearance of springs, examine how springshed management can help revive springs, especially in the Himalayan region. (150 Words) 10

झरनों के विलुप्त होने के पीछे निहित कारणों पर चर्चा करते हुए, परीक्षण कीजिए कि किस प्रकार स्प्रिंगशेड प्रबंधन झरनों, विशेषकर हिमालयी क्षेत्र में झरनों को पुनर्जीवित करने में सहायता कर सकता है।

According to recent reports by Conservation International & GoI assessment many of springs in Himalayan region are getting dry especially in Sikkim & Arunachal Pradesh & Uttarakhand

{ Why Drying? }

- Retraction of Ice Cover - due to Global Warming, ice cover is retracted further uphill.
- More evaporation - due to higher temperature.
- Erratic Rainfall - due to climate change.
- Excess exploitation - of source water by local people.

This Topography - due to slopes water is not able to store for long time.

{Springhead Mgt.}

It is a holistic approach in spring area, ~~center~~ involving all stakeholders in spring water source basin area.

How Helped In Rejuvenating?

- ① It considers all base sources - like ice melting, rivulets, rainfall on slopes etc. $\Rightarrow$ augmented sources for ground water
- ② Local Mgt. $\Rightarrow$ fast action in any break of source boundaries & a feeling of community good
- ③ Proper bunds creation around spring.
- ④ Sustainable Water use by local keeps check of base water level.

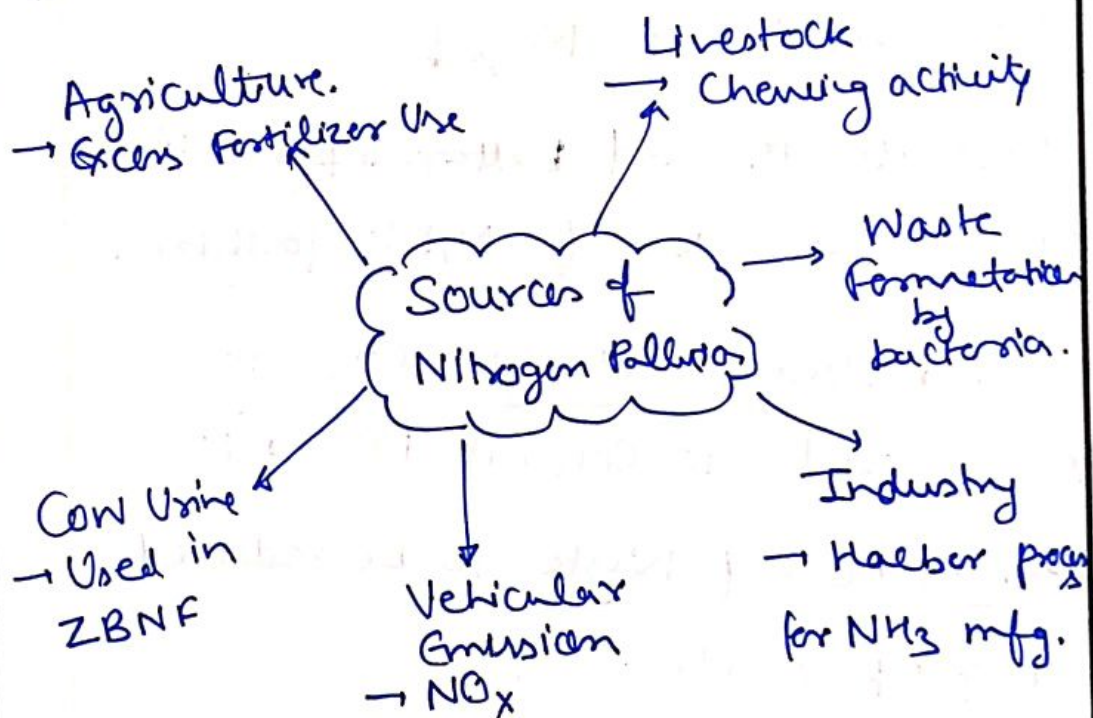
Thus, Springhead Mgt as made compulsory by Sikkim govt. must be replicated by other states too.

7. Giving a brief account of rising nitrogen emissions in India, discuss why it is a matter of concern. What steps can be taken to limit such emissions?

(150 words) 10

भारत में बढ़ते नाइट्रोजन उत्सर्जन का एक संक्षिप्त विवरण प्रस्तुत करते हुए, चर्चा कीजिए कि यह चिंता का एक विषय क्यों है। ऐसे उत्सर्जन को सीमित करने के लिए क्या कदम उठाए जा सकते हैं?

According to recent CPCB report
Nitrogen emission have increased
by >100% in last decade.



Why Nitrogen Pollution is Harmful?

- Minimata disease by Nitrate pollution
- Burning in eye.

- Respiratory problem
- N_2O is ozone depleting gas
- NO_2 is greenhouse gas $\Rightarrow$ Warming $\uparrow$

(Steps to Reduce N Pollution)

- ① BS VI Norms for vehicles all over India $\Rightarrow NO_x \downarrow$
- ② Soil Health Card better implementation for judicious use of N, P, K fertilizer
- ③ In Industry, Catalytic Converters to be used to convert $NO \rightarrow N_2$
- ④ Fermentation of Waste to be reduced by proper decomposing
- ⑤ Rationalizing agricultural subsidies.
- ⑥ Vegan diet - to reduce livestock pressure

Thus, a multipronged approach must be taken to reduce threat from N pollution.

8. Montreal Protocol is often considered as the most successful international environmental treaty. Highlighting the achievements of the protocol, discuss the reasons for its success. (150 words) 10

मांट्रियल प्रोटोकॉल को प्रायः सर्वाधिक सफल अंतर्राष्ट्रीय पर्यावरण संधि के रूप में माना जाता है। इस प्रोटोकॉल की उपलब्धियों पर प्रकाश डालते हुए, इसकी सफलता के कारणों पर चर्चा कीजिए।

Montreal Protocol to Vienna Convention for phasing out ozone depleting chemicals is ~~now~~ ratified by all UN countries (184/184) & brought the results.

- After phasing CFCs, countries have decided to start phase out HFCs from 2019 as per Kigali agreement

Achievements

- Estimated by scientists that Ozone over N hemisphere & mid latitude will be healed completely by 2030.
- by 2050, ozone over S hemisphere will start healing & by 2100 we will be in our past state.

Why so successful

- ① Wide Ratification - by all UN Countries.
- ② Better information - about harmful effects of UV Rays ensure unanimous support.
For eg - Every school children in India know about Ozone benefits.
- ③ Better Monitoring - due to binding provision & threat of strong penalties.
- ④ Global Commons - Care about Antarctica, Ozone & UV rays disastrous skin cancer affecting pop. all over world.

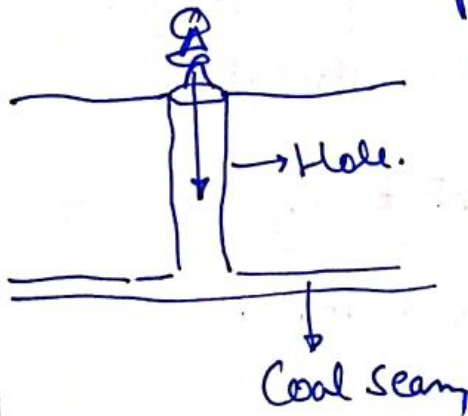
There, is need to replicate such strong commitment for its 2nd phase from 2019 & also in Paris Climate Pact to ~~do~~ sustainably manage Climate Change impact.

9. Elaborate on the concept of rat-hole mining. In the context of North-Eastern India, highlight its ecological consequences. Also, explain why it still persists despite the ban imposed by National Green Tribunal (NGT)?

(150 words) 10

रैट-होल खनन की अवधारणा का सविस्तार वर्णन कीजिए। उत्तर-पूर्वी भारत के संदर्भ में, इसके पारिस्थितिकीय परिणामों पर प्रकाश डालिए। साथ ही, समझाइए कि राष्ट्रीय हरित अधिकरण (NGT) द्वारा इस पर प्रतिबंध लगाए जाने के बावजूद यह अभी भी प्रचलन में क्यों है?

Rat hole mining as contrasted to open cast mining refers to Mining practise in which deep long holes/boxes are digged to take out coal/Minerals from great depth.



Why done in NE

- due to thin coal seam bed, $\Rightarrow$ less open cast mining is non-remunerable
- low investment by poor corporates of NE.

Ecological Consequences

- Unsustainable height - $\Rightarrow$ failure of side supports $\Rightarrow$ collapse

2. Earthquake & Swarms - due to
collapse of deep born.

3. Landslides in downslope areas

4. GLOFs due to tremors.

→ Also, vulnerable section life especially
children who are usually employed
in these areas is under threat

Why exist despite NGT Ban

→ It is only remunerable mining
technique

→ Low investment

→ Poor people with less employment
in NE ready to offer life for money.

→ Nexus b/w local bureaucrats / politicians
& operators.

→ Loopholes in rules.

Rat hole mining with unscientific techniques
is harmful for both human & env.
Better scientific method need to sustainably
harness minerals of NE.

10. Discuss the factors responsible for location of high-tech industries in the vicinity of major metropolitan regions. (150 words) 10

प्रमुख महानगरीय क्षेत्रों के समीप उच्च तकनीकी उद्योगों की अवस्थिति के लिए उत्तरदायी कारकों की विवेचना कीजिए।

Most of the high tech industries eg- Data Analysis, ICT, Financial service, Consultancies, BPO's, etc. are located in metropolitan cities vicinity for eg- In India - around Bangalore, Delhi NCR, Kolkata etc. & Silicon Vally in USA. near California.

Why?

- Skilled Manpower - from world class Universities in these cities.
- Infrastructure - like electricity, transportation connectivity is better in these cities. ⇒ better Communtation of workers
- Development - of these cities is better ⇒ cleanliness, Educated people env.
- Govt. policies & local govt. (Municipal Committee) in this areas. for eg-

Smart Cities Mission covers all Metropolitan areas, SEZ are also near Metro cities.

- Better Network Connectivity - by Telecom providers in these cities.

Is it good?

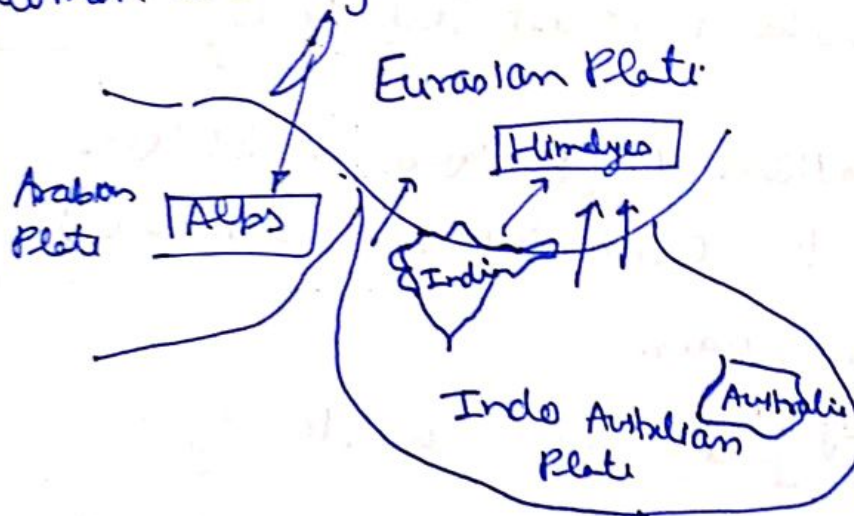
- Will create cities of global competitive levels
- But skewed development & increased inequalities
 - Like NE region is neglected.
- Migration ↑ - putting more pressure on the metros ⇒ More env. exploitation & inflation of prices
 - Also, creation of more slums in vicinity of Metros.

There is need of infra dev. & trade/ services setup incentives in low developed region for inclusive dev.

11. Explain the reasons behind earthquakes in Himalayas being more intense and frequent than the ones occurring in Alps region. Why are scientists predicting a largescale earthquake in northern India? Also, elaborate upon some prominent earthquake forecasting techniques. (250 words) 15

आल्प्स क्षेत्र में आने वाले भूकंपों की तुलना में हिमालय में आने वाले भूकंपों के अधिक तीव्र होने और बारंबार आने के पीछे उत्तरदायी कारणों की व्याख्या कीजिए। वैज्ञानिक उत्तर भारत में उच्च तीव्रता वाले भूकंप के आने की भविष्यवाणी क्यों कर रहे हैं? साथ ही, भूकंप पूर्वानुमान संबंधी कुछ प्रमुख तकनीकों का निवस्तार वर्णन कीजिए।

Himalayan region is frequently confronted with earthquake, swarms, landslide & thus ~~pre~~ disrupts economic & human activity.



As observed by scientists, Indo Australian Plate is continuously moving towards Eurasian Plate by 1.5cm/year which led to continuous rise of young Himalayas & consequential earthquake

due to sudden release of energy

- Alps region - in Middle of Europe surrounded by Germany, Switzerland, France, Poland is not an junction of two plates unlike Himalayas, thus less earthquakes.

Earthquake Forecast Techniques

- Observation of P waves & S waves sending to earth interior & measuring deflection angle.
- Measuring ^{tectonic} plate movements. For eg - by Hotspots movements. & forecast future locations.
- By Natural Wildlife signals like Snakes come out of their holes early. before earthquake.

Why Strong Earthquake Prediction

- Due to climatic impacts, it is observed that movement rate of plates is going to increase.
- North India is in influence of Arabian Plate, Indo Australian Plate & Eurasian plate & their strong interaction can cause serious earthquake.

There is need to ^{better} forecast techniques for earthquakes by looking for tools to measure earth interior activity so that early warning can be disseminated to provide large scale disaster.

12. Describe the mechanism of formation, movement and dissipation of tropical cyclones. In this context, explain why the recent 'Titli' cyclone was termed as 'rarest of rare' by IMD. (250 words) 15

उष्णकटिबंधीय चक्रवातों के निर्माण, संचलन और क्षय की प्रणाली का वर्णन कीजिए। इस संदर्भ में, व्याख्या कीजिए कि हाल ही में आए 'तितली' चक्रवात को IMD द्वारा क्यों 'दुर्लभ में दुर्लभतम' (रेयरेस्ट ऑफ रेयर) कहा गया था।

Tropical Cyclones are large air mass circulating around a low pressure area which when crossed ocean lead to havoc in economic life in coastal areas.

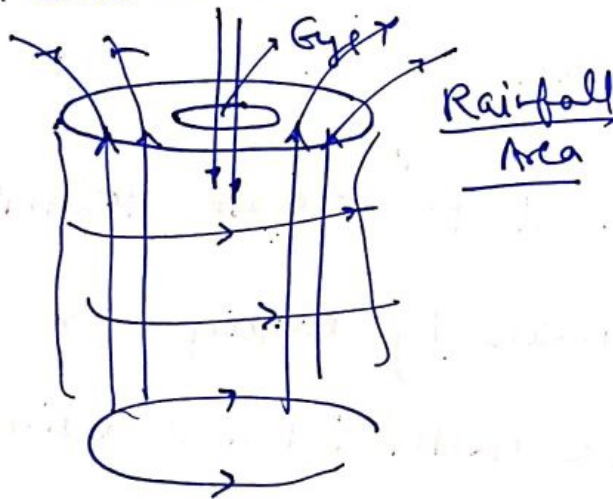


Fig: Tropical Cyclone.

Essential Condition for formation

- ① High water temp in tropical area.

② Intense low pressure area

③ Close isobars.

④ Coriolis force

⑤ Constant water source.

→ They are fueled by energy from condensation of water vapours & act as heat engines

Movement

→ They move in East to West direction & never cross equator due to absence of Coriolis force

Why E → W — due to steering by tropical easterlies.



⇒ In India, Cyclones emerged in Bay of Bengal effect WB, Orissa, AP & TN every year.

Cyclone Titli brought havoc on Odisha coast in 2018.

Why rarest of Rare

- Generally Dissipation of Cyclone occur when they make landfall as due to break for water source.
- But Cyclone Titli kept his vigorous nature even after landfall.
- ② Reforming after landfall
- ③ Large scale economic & human life diminution.

Due to climate change, cyclones are going to be increased & more disastrous. What is needed -

- Proper Adaptation & Mitigation
- Bio shield of Wetland & Mangroves.
- Less intensive activity along coast
- Early warning & NDMA guidelines should be adhered.

13. Differentiate between eustatic and isostatic type of sea-level changes. Also, discuss the resultant landforms which are likely to be formed as a result of sea-level fluctuations. (250 words) 15

सुस्थितिक और समस्थितिक प्रकार के सागर तल परिवर्तनों के मध्य अंतर स्पष्ट कीजिए। साथ ही, सागर-तल के उतार-चढ़ाव के परिणामस्वरूप निर्मित होने वाली संभावित परिणामी भू-आकृतियों की भी चर्चा कीजिए।

Sea level rise is not uniform
all over the world.

- Some areas are at particular
thrust & at in some areas it
cause depositional feature & in
some erosional feature.

New Landforms

- ① Drowning of Islands
Eg - Fiji, Maldives.
- ② Fjords in Polar region

- ③ New type of forests - salt tolerant species.
- ④ New type of agri practice.
- ⑤ Coastal features - even mountains & high cliffs will be eroded.
- ⑥ Deposition, - eg gravels on Nice Beach in France.
- ⑦ New islands by deposition in Midway Ocean.



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(इस भाग में
कुछ ना लिखें)

14. Discuss the vulnerabilities of urban areas to disasters. What measures have been taken to minimise the losses in such areas during disasters? What further improvements would you suggest to make them more resilient?

(250 words) 15

आपदाओं के प्रति शहरी क्षेत्रों की सुभेद्यताओं पर चर्चा कीजिए। आपदाओं के दौरान ऐसे क्षेत्रों में होने वाली क्षति को न्यून करने के लिए क्या उपाय किए गए हैं? आप उन्हें और अधिक लचीला (रिज़िलियन्ट) बनाने के लिए क्या उपाय सुझाएंगे?

Urban areas all over world are areas of intense economic activity, large population density and many of them located on coast & hinterland, & characterized by skyscrapers & contrasting jhuggis in vicinity.

Vulnerabilities to Disasters

- ① Earthquake - Can significantly effect illegal, unsustainable tall structures.
- ② Cyclone, Tsunami - On Coastal metro cities. Eg - Chennai
- ③ Urban Heat Island - due to pollution & warming ⇒ Intense Heatwaves

- ④ Flooding - near river plain during erratic. Monsoon season
eg - Patna, Mumbai

Given, their economic importance & large human population residing there, there is need to take effective measures. Some measures undertaken

- ① Earthquake Zoning - to prevent tall structures in Zone IV & V, making earthquake resilient infra & Mock Drills for unfortunate events.

- ② CRZ - Coastal Regulation Zones - preventing intense human activity near HTL. They should not be diluted by recent amendments.

- ③ Better Drainage - Public Works undertaken in Mumbai, Delhi to prevent ever-frequent water-logging.

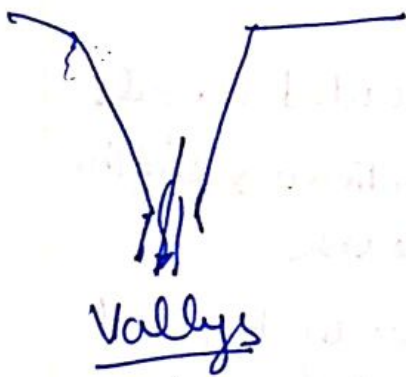
- ④ Bioshields for Tsunami & Cyclone
For eg - Bhitarkanika & Chilika Mangrove
are revamped on Odisha Coast.
- ⑤ Focus on EV, BS VI Norms to prevent
Warming & Heatwaves also divergence
of vehicle by Sidepasses & Ring Roads
- ⑥ Early Warning Systems for disasters
& dedicated authorities like INCOIS
- ⑦ Comprehensive act NDMA, 2005 (National
Disaster Mgt. Act) which duly consider
urban area vulnerability.
- ⑧ Intersectoral Collaboration like TRIMES to
get better info to prevent situation
like 2004 Tsunami.
- ⑨ NDMA & SDMA & Municipal Committee
taking regular monitoring, Capacity building
& Mock drills.
India should keep adhering to Sandani
Framework & use better scientific tools
to decrease vulnerability to Urban Disasters

15. Explain the role of river as a geomorphic agent with suitable examples of landforms formed during its course of flow. (250 words) 15

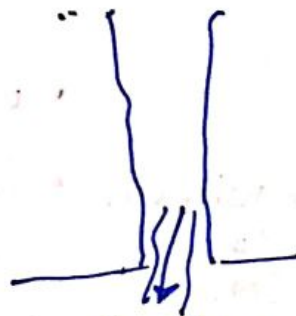
नदी प्रवाह के दौरान निर्मित होने वाले भू-आकृतियों के उपयुक्त उदाहरणों सहित भू-आकृतिक कारक के रूप में नदी की भूमिका की व्याख्या कीजिए।

Rivers act as a strong erosional & depositional agent due to high Kinetic Energy of water flow & creates varied landforms in its life course.

Youth Stage - Downward cutting is prominent & high velocity of water along slopes is observed.

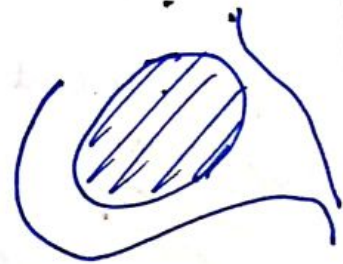


Valleys



Gorges

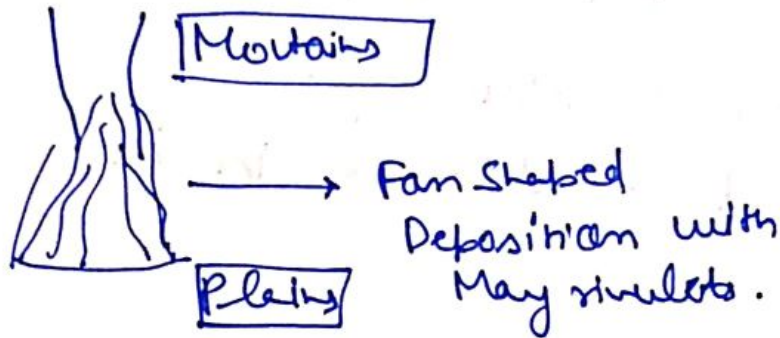
U shaped



Canyons

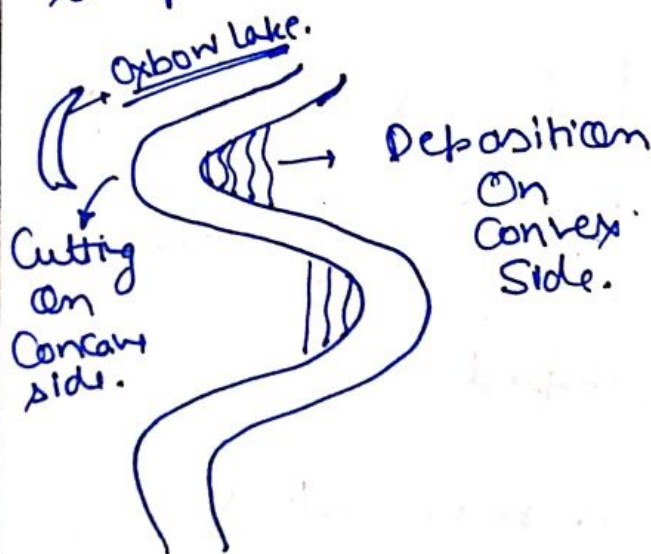
Middle Stage - When river leaves mountains & enters plains

Foreg - In India Teral region where river re-emerged after getting hidden in many rivulets.



→ Terai are waterlogged high productive Region.

Old Stage - Here sideward cutting is prominent.



- Braided Channels
- Continuous shifting course
- Floody in flood plains.

Discharge in Ocean

Many river form fan shaped deltas because of low water speed, sediment holding capacity is reduced & all sediments are deposited

For eg - Sunderban deltas by Ganges-Brahmaputra

→ While river with short course & low sediments don't form delta
Eg - Narmada, Tapi, Sharavati etc.

Thus, Rivers the arteries of a nation
forms may erosional & depositional
features in its course

16. Analyse how far the 'Katowice Climate Package' goes in achieving the objectives of the Paris Climate agreement amid the concerns of developing countries like India. (250 words) 15

विश्लेषण कीजिए कि भारत जैसे विकासशील देशों की चिंताओं के संबंध में पेरिस जलवायु समझौते के उद्देश्यों को प्राप्त करने में 'कैटोवाइस जलवायु पैकेज' कितना कारगर सिद्ध हुआ है।

Recently, COP 21 (Conference of Parties) to UNFCCC (United Nations Framework Convention on climate Change) was held in Katowice, Poland. It was also CMP 6 (Conference of Member Parties) to Paris Agreement, 2016.

What is Paris Agreement

In it, parties to agreement agreed to limit the global temp. rise by 2°C from pre-industrial levels & also strive to limit it by 1.5°C as far as possible.

→ Around 150 countries are parties to it. Significant Non-Members - USA, Iran

Outcomes of Katowice Summit

- ① Rulebook on accounting norms of how to measure & report emission reduction is finalized.

⇒ In future, better monitoring of emission from individual countries.

- ② SDM (Sustainable Development Mechanism) as successor of CDM (Clean Dev. Mechanism) is not finalized.

- ③ IPCC Report 6 titled 'Global Warming of 1.5°C' see heated debate.

⇒ Shows political negligence of scientific evidences for economic exploitation.

- ④ Overall Mitigation in Emission Norms as shift from just shifting of emissions is not finalized.

- ⑤ Voice of Greta Thunberg & school children was echoed ⇒ shows

Information penetration about Climate Change in children.

- ⑥ Warsaw Financial Mechanism for Mitigation of Impact on Island & vulnerable countries was made fundless.
- ⑦ Overall, less focus on strong devaluation from developed countries was observed & more on developing countries to to fund their project themselves.
- ⑧ Also, Global Stocktake dates for NDC (National Determined Contribution) ~~was~~ assessment was finalized.

This, shows that Katowice Package has decreased devaluation & slow in realizing pre-requisite infrastructure for enforcement of Paris Agreement from 2020. There is need to take hard measures on developed countries for from taking responsibility for their past deeds & fund & technology transfer.

17. What is Conservation Agriculture? Highlight the prospects and challenges of adopting Conservation Agriculture in India. Also, mention some important policy considerations for its promotion. (250 words) 15

संरक्षण कृषि क्या है? भारत में संरक्षण कृषि को अपनाने की संभावनाओं और चुनौतियों पर प्रकाश डालिए। साथ ही, इसके प्रोत्साहन के लिए कुछ महत्वपूर्ण नीतिगत उपायों का भी उल्लेख कीजिए।

Conservation Agriculture are farming techniques which focus on sustainable farming by using various methods like

- Zero Budget Natural Farming (ZBNF) - Chemical free.
- Organic Farming
- Less tillage & minimal ploughing.
- Soil Health improvement by manure.
- Mulching, less irrigation, Vermicompost
- Intercropping, Mixed farming
- Forestry farms - Trees with crops.

Cons. Agri. helps in reducing farming cost, improve soil health & productivity, & is sustainable in long term.

Prospects

- ZBNF ⇒ farmer indebtedness ↓ & health incomes. Today, in India 50% farmer are indebted (NSSO) ⇒ Highly relevant to follow up in India.
- Ecological benefits - Solution to Water Crisis, (as agri. alone accounts for 80% water use in India)
Increased forest cover, soil health.
- Human - better nutritious food (as excess fertilizer use cause Cancers in Punjab).

Challenges

- Lack of knowledge among farmer.
- Time Consuming
- Apprehension of low yield - as seen in Sikkim after fully organic practices.
- Food Security issues - still 15% pop. sleep with hunger stomach.
- Resistance of farmer.

Important efforts taken by Govt.

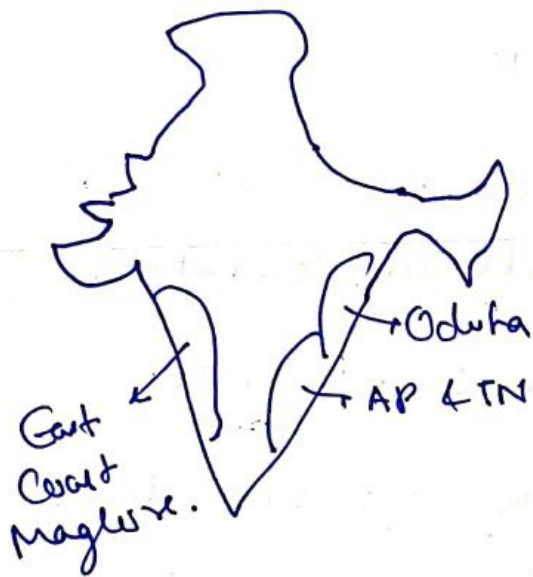
- PM Parampragat Krishi Vikas Yojana incentivise farmers to adopt organic practice.
- PM Krishi Vikas Yojna (PMKY-RAPTAAR) for Green Revolution allowed divergence of funds for ZBNF
- AP (Andhra) declared to adopt 100% ZBNF by 2024 following Karnataka.
- Sikkim - First fully organic state.
- Krishi Vigyan Kendras - for information dissemination about Conservation Agriculture.
- FPO & Farmer Coop. to scale up organic farming.
- NAFED provide international market for organic exports.

Though, the efforts are worth appraising there is need for better implementation to achieve SDG Goals & Doubly farmer income by 2022.

18. Elaborate the concept, objectives and distribution of Petroleum, Chemicals and Petrochemical Investment Regions (PCPIRs) in India. Also, examine why the PCPIRs have failed to achieve the desired success. (250 words) 15

भारत में पेट्रोलियम, रसायन और पेट्रोसायन निवेश क्षेत्रों (PCPIRs) की अवधारणा, उद्देश्यों एवं वितरण का सविस्तार वर्णन कीजिए। साथ ही, परीक्षण कीजिए कि PCPIRs वांछित सफलता प्राप्त करने में क्यों विफल रहे हैं।

There are currently 4 PCPIRs in India.



All of them are in Coastal areas.

Objective

- To increase investment
- Promote FDI
- Elimination of barriers.

- Energy Security.
- World scale Competitive Industry
- Export Earnings

Why Failed

- Less govt. Incentives.
- Port Capacity & Connectivity
- Infra like electricity.
- Tight Labour laws $\Rightarrow$ Less Investment.
- FDI policy.
- Rupee Volatility.

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19. National Policy on Biofuels 2018 primarily tries to address supply-side issues that have discouraged the production of biofuels within the country. Elaborate. What other benefits are expected from the policy?

(250 words) 15

जैव ईंधन पर राष्ट्रीय नीति- 2018 मुख्य रूप से आपूर्ति पक्ष के मुद्दों का समाधान करने का प्रयास करती है जिन्होंने देश के भीतर जैव ईंधन के उत्पादन को हतोत्साहित किया है। सविस्तार वर्णन कीजिए। इस नीति से और क्या लाभ होने की उम्मीद है?

National Policy on Biofuels aims to promote production & use of Biodiesel, Bioethanol, Biojet, Biogas etc & is holistic in nature.

Tackling Supply Side Issues

- ① Allowed use of surplus foodcrops in biofuel production
- ② Increased list of foodcrops by including Sugarcane, Maize etc.
- ③ Divided fuels in 4th
 - 1st Gen — from foodcrops
 - 2nd Gen — from agri waste & energy crops like Jatropha
 - 3rd Gen — from Algae
 - 4th Gen — crops which have Carbon Sequestration potential.

④ Provide Incentive for higher gen. biofuel production by Viability Gap Funding.

⑤ Barred exports of biofuels.

Demand Side Issues

① Made targets of compulsory 20% biofuel mixing in ethanol & 5% in diesel by 2030.

② Mandatory procurement by PSUs & industries

③ By flights like SpiceJet on Turbo-biofuel it promote market extension.

Why Biofuels Promotion?

Biofuels are drop in fuels produced from organic agri waste fermentation which can be directly used in

vehicles with less modification

Benefits -

- Decreased NO_x emission
- Better fuel utilization efficiency as proven in test
- Less sulphur content $\Rightarrow$ Better Catalyst Convertors can be used.
- Better income source from farmers
- Use of agri waste (Waste $\rightarrow$ Energy)
 $\rightarrow$ solve problem of stubble burning & pollution by PM-JIVAN (Jai Indhan Vatankulit Krishi Araishesh Nirvanam Yojana).
- Cattle dung used to produce Biogas
 $\Rightarrow$ Energy security
- Combat Climate Change

Thus, Policy address demand & supply side issues & will be big leap towards sustainable dev. & prosperous India & farmers.

20. Identify the major Uranium reserves in the world and the countries from where India sources it. What measures are required to ensure supply security of fuel for nuclear plants in the country? (250 words) 15

विश्व के प्रमुख यूरेनियम भंडारों और उन देशों की पहचान कीजिए जहाँ से भारत इसका आयात करता है। देश में परमाणु संयंत्रों के लिए ईंधन आपूर्ति की सुरक्षा सुनिश्चित करने के लिए किन उपायों की आवश्यकता है?

~~Major~~ Uranium reserves in World are distributed across varied continents. India being low in Uranium need to import it for Nuclear energy production.

Major Reserves in World

- ① Kazakhstan
- ② Uzbekistan
- ③ Australia
- ④ Russia
- ⑤ USA.

India has bilateral agreement with Kazakhstan, Russia, Australia & recently with Uzbekistan. Also, USA is long supplier from 2006 treaty.

Measures Needed for supply security

- ① Diplomatic efforts.
- ② Demonstration of peaceful use of IAEA (Intl. Atomic Energy Authority).
- ③ Denuclearization of Nuclear ~~arsenals~~ arsenals.
- ④ Bidding for NSG (Nuclear Supplier Group) Continuous entry.

Given, the energy needs of future large population in India, India should see Nuclear energy as a viable energy security option.