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GENERAL STUDIES (TEST CODE : 1824)

Name of Candidate	CHAITANYA KHEMANI		
Medium Eng./Hindi	ENGLISH	Registration Number	746087
Center	ONLINE	Date	

INDEX TABLE			INSTRUCTIONS
Q. No.	Maximum Marks	Marks Obtained	
1	10		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 काटा जाना चाहिए।
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Total Marks Obtained:			
Remarks:			

16-B, 2nd Floor, Above National Trust Building, Bada Bazar Marg, Old Rajinder Nagar, Delhi-110060

Plot No. 857, 1st Floor, Banda Bahadur Marg (Opp Punjab & Sindh Bank), Dr. Mukherjee Nagar
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.

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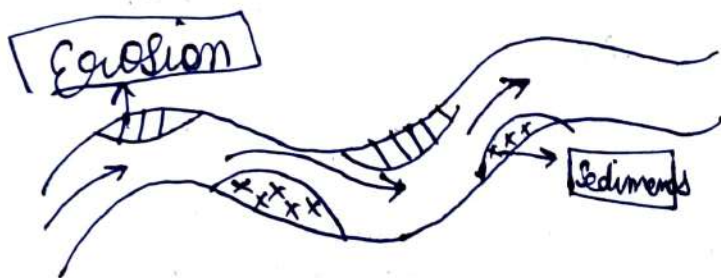
All the Best

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Answer Questions in NOT MORE THAN the Word Limit specified for each in the Parenthesis.
Content of the Question is more important than length.
(Specimen Answer Booklet - For Practice Purpose Only)

① Explaining the concept of meandering. Identify the various landforms associated with flood plains.

Meandering is the cumulative movement of the river in the middle course owing to gravity and the enormous amount of sediments it is carrying



Meandering

Meandering leads to creation of fertile flood plains, on-bow lakes.

Meandering of ganges in UP, Bihar
Are prominent examples in India

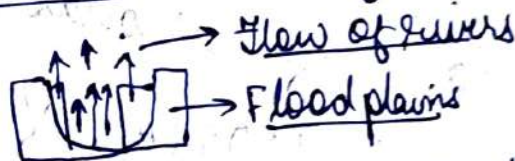
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उत्तरों में शब्दों की संख्या 3 नहीं होनी चाहिए
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Floodplains is the deposition of sediments that had previously being eroded and weathered by the river in the upper stages.

Every year, the river breaches its banks leading to creation of fertile, alluvial enriched floodplains.



The landforms associated with floodplains are:

- Meander: Curvilinear meand. of river.
- River valleys: Fertile flatlands
- Oxbow lakes: 'U' shaped lakes

Floodplains represent the fertile regions of the geography and provide source of food to the population. They must be preserved and protected.

(Please do not write anything except the question number in this space)

कृपया इस स्थान में प्रश्न संख्या के अतिरिक्त कुछ न लिखें।

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②

What is a cloudburst and what are its effects? Why are they more frequent in the Himalayan region.

Cloudburst is the sudden, enormous rainfall over a very small region without prior warning. Often, the criteria of cloudbursts is more than 100 mm of rain over 20-30 sq. m. in an hour or two.

Effects of cloudburst

↳ Flashfloods: sudden movement and breach in river banks

↳ Erosion of topsoil

↳ Landslides, soil creeps

↳ Destruction of structures, dams, bridges.

↳ Avalanches in colder areas.

↳ Loss of life of humans & animals

do Cloudbursts - frequent in Himalayas

↳ Nature of South West Monsoon -
Intense, rainfall in the summer

↳ Geographic structure - high mountains lead to relief rainfall

↳ Widespread deforestation, human-
related development has put
pressure on the environment
leading to more calamities.

Cloudbursts represent destructive
nature of our environment. eg:

Uttarakhand Cloudbursts. The

National disaster management authority
guidelines must be followed to mitigate vulner-
ability

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3

Volcanic eruptions are widely considered as agents of destruction. But they also have certain positive impacts on the people and landscape. Discuss.

Volcanic eruption is sudden dispersal of lava, molten rocks, gaseous plumes from within the interior of the earth to the outer surface. eg: Mt. Vesuvius - Eruption (Italy), Krakatoa (Indonesia)

Volcanoes - Agents of Disruptions

- They cause destruction of lives, property, animals.
- Disrupts air travel, due to thick smoke erupted.
- Leads to acid rains due to sulfur emissions.
- Destroys entire cities, islands eg: Pompeii (Italy) solidified due to eruption.
- Leads to climate change in far off places.
- Sources of Earthquake, Tsunami.

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Volcanoes - positive impact on geography

↳ Agents of creation of crust, ridges.

eg. Mid oceanic ridges created by

Volcanoes according to Sea-floor spread Theory.

↳ Several intrusive landforms like Dykes, Sills, Batholiths, Leploliths Created.

↳ Islands are formed by eruptions eg Hawaii islands Created by eruptions

Volcanoes - positive impact on people

↳ Leads to creation of fertile black soil

which is very optimum for agriculture

eg: Deccan trap (India) - sugarcane, cotton cultivation

↳ Igneous rocks are storehouse of minerals,

eg: Lumice, granite used for construction.

↳ potential tourism and places of interest.

eg: Hawaii magma flows attract tourists.

Volcanoes represent the ~~good~~ "building" aspect of nature, but, it also leads to disruptions and loss of lives & property.

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⑧

How does the interaction between oceans and the atmosphere stabilize and regulate the climatic variations over the Earth?

Atmosphere is the layer of air surrounding the Earth enveloping all around the hemispheres. Eg- Troposphere, Stratosphere.

Oceans are the vast bodies of water covering over 75% of the Earth.
eg: Indian Ocean, Atlantic Ocean.

Interaction between oceans and atmosphere

↳ Help in stabilization & regulating the climatic variations.

↳ Heat radiated from Sun, passes through the atmosphere and is absorbed by the oceans ~~via~~ and transported from equatorial

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regions to ~~the~~ polar regions via ocean currents eg. Benguel Current, Drumholtz current

↳ Thermohaline circulation helps in regulating the saline and heat variations of the region. eg. atlantic Meridional circulation

↳ Planetary winds (Trade winds, Westerlies, polar cold winds) formed due to atmospheric pressure variations flow over the oceans and help regulate the climate. eg. Westerlies blowing in the mid latitude bring winter rainfall and form "Mediterranean form of climate"

↳ Easterly Jet streams which blow in the high latitudes form cyclones, polar vortex leading to bitter cold in North America and Europe.

Ocean and atmosphere are interconnected in maintaining homeostasis in the Earth and preserving the optimum conditions for living.



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5 Despite its potentials there are several challenges in the implementation of the Ken Betwa link project. Discuss

Ken-Betwa linking project is the joining of the Ken and the Betwa rivers which flow in Uttar Pradesh and Madhya Pradesh.

Potentials of the linking project

- ↳ It will increase navigability of the rivers.
- ↳ Source of irrigation for the nearby regions.
- ↳ Perennial source of water for the local population including the dry summer months.
- ↳ Tourism potential eg: inter-river cruise

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Challenges for the project

↳ will lead to displacement of indigenous population eg: Bhib, Gondos
will ~~lose~~ ^{lose} their ancestral land.

↳ Submergence of vast swathes of fertile land

↳ Disruptions in the nearby tiger reserves, national parks, wildlife sanctuaries.
eg: Kanha Tiger reserve, Panch forests will be harmed.

↳ Will require tremendous financial capital.

Inter-linking of rivers provide revolutionary progress and development of entire region (eg: Tennessee Valley Project, USA). However, concerns regarding the welfare of indigenous people, flora, fauna, peasants must also be taken care of.

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Q How are atolls formed? Discuss the threats faced by them due to anthropogenic factors

Atolls are circular lagoons and broken islets formed by the actions of deposition by the oceans and the consequent actions of corals. eg: Bikini atolls



Atolls

Atolls comprise of shallow lagoons, islets, sandbars which are interrupted in between ~~due~~ to allow passage of freshwater. Corals, marine fishes, are found in abundance.

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Threats to atolls due to anthropogenic factors

- ↳ Coral bleaching leading to destruction of coral reefs.
- ↳ Ocean water acidification leading to rendering of atolls inhospitable for species.
- ↳ Increase in sea water due to climate change and thermal water expansion causing submergence of atolls.
- ↳ Plastic pollution, oil spills, unsustainable tourism has further harmed the ~~so~~ atolls.

~~atolls~~ represents hotspots in biodiversity.

They must be preserved and protected.

Initiatives like litter to contain plastic pollution are in the right direction. Convention on preventing marine pollution must be implemented strictly.

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7) Foaming in the beginning of winter in River Yamuna in and around Delhi has been in news. Identify the reasons behind this and discuss its larger impact.

River Yamuna originates in the Yamunotri glaciers of Uttarakhand and joins Ganges at Sangam, Prayagraj.

Yamuna - Most polluted river.
Breathing in winter

↳ Emissions from industrial towns of Panipat, Delhi — untreated liquid effluents discharged from factories lead to foaming in the river.

↳ Agriculture runoff — chemical fertilisers, pesticides and surface runoff further accentuates foam forming

↳ Lack of rains, further leads to concentration of chemicals in the river.

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Impact of breaching

- ↳ Leads to poisoning of the floodbanks
- ↳ Harmful effect on human health, land animals eg. contaminated drinking water
- ↳ Fishes die in the river due to lack of oxygen dissolved.
- ↳ Leads to unsustainability in urban development - eg. Delhi is consistently ranked among least liveable cities of the world.

The river Yamuna must be properly managed on lines of National Ganga Mission. Integrated approach involving all stakeholders must be adopted. Ministry of environment and Ministry of Urban development must work in tandem to ensure eradication of the froth formation. National Green Tribunal's recommendation must be adopted.

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8 Explain the process of formation of a Tsunami.
Also, mention the tsunami preparedness
and mitigation efforts taken by the government.

Tsunami is the enormous sea-
waves which engulf entire coastlines
via extremely high waves flowing
at extremely high speeds. eg. Indian
Ocean Tsunami (2004)

Formation of Tsunami

↳ Tsunami formed via vast
disturbances of sea water due to
earthquakes, underwater volcanoes,
meteorite impact or avalanches.

↳ As a result, enormous waves
with high amplitude are created due
to displaced energy.

↳ As they approach the coast, the
amplitude decreases, speed and height
increases, crashing into the shore.

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destroying everything on its way.

Tsunami early preparedness & Mitigation in India

↳ NDMA is the nodal agency for disaster management.

↳ Tsunami Vulnerability mapping (with Collab of Ministry of earth sciences & ISRO) has been done.

↳ India is a part of all Tsunami Warning Systems around the globe. Eg: India is member of Pacific Tsunami warning system.

↳ India has developed its own Indian Tsunami Early Warning System along with INCOIS.

↳ System of seismic movement detection & centers established nationwide.

↳ ISRO's GAGAN & NAVIC equipment promoted to prevent loss of lives.

↳ District authorities - point of contact between NDMA and Gram Sabhas undertake regular sensitisation and disaster readiness exercises in vulnerable areas.

Tsunamis represent the destructive nature of the environment. Vulnerability towards it must be reduced.

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Q Discuss the role of geospatial technologies in developing effective approaches for disaster risk reduction and disaster Management

Geospatial Technology represents mapping of all techno-objects that occupy place on the surface of the Earth. It involves - Radiomapping, GIS and Geospatial information system

Geospatial Technology - Role in Disaster Risk Reduction

Pre disaster

↳ Helps in vulnerability mapping

eg: Mapping of landslide prone areas of India was undertaken with help of Geospatial Technology

↳ Helps in forming database of high risk populations, structures and infrastructure eg: mapping of bridges, dams, railway lines

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During Disaster

- ↳ It helps in establishing contact with disaster struck people.
- ↳ Helps in ~~refugee~~ identification of lost stuck people and relief and rescue operations. eg. During Uttarakhand floods, GPS Technology was used to identify locate people stuck at Kedarnath.

Post disaster

- ↳ Helps in rehabilitation of people and lives, by, helping in supply of food, medicine, water.
- ↳ Focusing on 'Building back better' in the future.

Geospatial technology is the positive development in curtailing vulnerability towards disaster. This technology must be further developed and implemented to ensure "Zero casualty" in disasters.

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10. Discuss the Key challenges in implementation of school safety. How does the National Policy on Disaster Management seek to address these challenges?

Schools involve children who are among the most vulnerable sections of the society. eg. Fires in Schools, Coaching centres at Surat.

Challenges in implementation of school safety

- ↳ Students are very vulnerable — they are very low risk tolerant, prone to injury & mortality.
- ↳ School infrastructure is already very constrained especially in the rural areas.
- ↳ Adult supervision in schools is very low due to the poor teacher-student ratio in India.
- ↳ Curriculum of schools less focused towards disaster risk reduction.

National Policy on Disaster Management, 2009

- ↳ Identifies children as vulnerable population.
- ↳ Focuses on improving school infrastructure to prevent structural collapse during earthquakes, cyclones.
- ↳ Encourages regular drills, trainings for evacuations during disasters.
- ↳ Incorporate disaster management in the curriculum and syllabus.
- ↳ Disaster - friendly structures like fire-exits, alarms, water-hydrant systems made mandatory.

School going children are among the most vulnerable — they must be properly trained and educated to ensure their safety during disasters. The National Education Policy is in the right direction.

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11

Post drift theories based on ocean floor mapping provided new dimensions to the study of distributions of oceans and continents. Elaborate

The Continental drift theory focused on the mass movements of the continents, after, breaking away from the supercontinent Pangea; Proposed by Alfred Wagner.

The post Continental drift involved Hess's Seafloor spreading Theory.

The Sea floor Spreading Theory

↳ Focused on the aspect that ocean relief is younger than continents

↳ Along the newly formed rocks deep underneath, either sides showed remarkable similarities in characteristics and nature properties

→ Thus, it could be concluded that rocks were created deep underneath leading to formation of new reliefs and geographical structure

→ Plate tectonics Theory states that continent plates float over oceanic plates; The collisions lead to formation of relief features.



New dimensions to study of Oceans & Continents

↳ Justified many new doubts and concerns regarding the existing theories.

↳ Example: The great pacific ring of fire lead to creation of mid oceanic ridges of Pacific.

↳ Ocean mapping explored Pacific trenches.

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↳ The submerged continent of
New Zealandia justified.

↳ The formation of the African Rift
Valley concluded.

↳ The Himalayas were formed by
the crashing of Indian Ocean plate
with Asian plate.

↳ Sea floor spreading theory added
to the dimension why similar flora
and fauna are observed globally.

↳ Sea floor theory gave rise to the
Theory of Plate tectonics which
further justified diastrophisms,
earthquakes, volcanoes, faultlines.

Thus, we can conclude, that Seafloor
mapping, helped, add new dimensions
to the study of distributions of oceans
and continents!

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- (15) Explain the phenomenon of Heat waves. Also Enumerate the conditions favourable for development of heat waves in India and their associated health impacts.
- Heat waves is the continuous ~~at~~ above normal temperature over a certain region for 3-5 days.
- Heat waves leads to higher temperatures, low humidity and localised hot winds (called 'loo').

Development of heat waves in India

- Heat waves common in North & West India and the Deccan Peninsula



↑ Heat Wave prone regions of India

Conditions favourable for Heat Waves in India

↳ Intense summer heat during April & May.

↳ Continental effect as North India
is located far away from Coast.

↳ Absence of monsoons, local
rainfalls in the summer months.

↳ Low-pressure region formed
due to intense heating of the
continental landmass.

↳ Very low humidity in the region.

↳ No westerly jet streams which
carry moisture during summers.

↳ Intense-unsustainable human
development, rampant deforestation
has further increased the
impact of heat waves in India.

Health Issues with heat waves

↳ It causes dehydration among
humans & animals due to lowering

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of water tables.

↳ Too leads to summer strokes, high body pressure and summer diarrhoea, body aches.

↳ Heat waves lead to tiredness, loss of energy, which, further impacts productivity.

↳ Hypertension, is observed among vulnerable population.

While, the heat waves cannot be escaped in India, its impact can be minimized by afforestation, sustainable urban developments. Ayurvedic remedies and Yoga can help curtail the health impact of heat waves.

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12-

Elaborate various factors that determine the nature of circulation of the oceanic currents - Also, highlight the major oceanic currents along with their unique features.

Oceanic circulations are vast movements of oceanic water along set directions. eg. Humboldt current, California current.

The factors that determine Oceanic current

↳ Planetary winds : eg. Westerlies drive ocean waters towards western parts of the continents.

↳ Shape of the continents : eg. Tapering shape of South America impacts the Peru current.

↳ Salinity of Ocean : Ocean currents mingle to ensure stasis in the salinity.

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उम्मीदवारों को इस हाशिए में नहीं लिखना चाहिए
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↳ Rotation of the Earth : Coriolis effect pushes water in anticlockwise direction in northern hemisphere and vice versa in the southern hemisphere.

↳ The temperature of the oceans too impact the direction of ocean currents
eg: Cold Labrador current flows from the polar Canadian region into newfoundland bay.

Major Oceanic currents along with unique features

Atlantic Ocean

South

Benguela current

• Warm Current ; along west African Coast
• Flows from Equator towards Antarctic.

Brazilian Current

• Cold Current ; along Brazilian Coast
• Flows from Antarctica towards Equator.

North

Gulf Current

• Warm Current
• along Gulf of Mexico

Canary Current

• ~~Warm~~ Cold Current
• along Western Europe & Africa Coast

Labrador Current

• Cold Current
• along New Foundland Coast

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कृपया इस स्थान में प्रश्न संख्या के अतिरिक्त कुछ न लिखें।

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Pacific Ocean

Peru Current

- Cold Current
- Along Peru Coast

California Current

- Cold current
- Along California Coast

Okhotsk Current

- Cold Current
- Along Japan Coast

Kuroshia Current

- Warm Current
- Along the Japan Coast

Indian Ocean

Agulhas Current, west Australian Current
dominate the Indian Ocean

The Oceanic currents play a major role in maintaining optimum conditions on the Earth via regulation of temperature, rainfall and humidity.

14

Despite being polar regions, the environmental threats faced by Arctic region are slightly accentuated as compared to Antarctica. Comment - also, discuss the measurements needed to protect the Arctic ecosystem.

The polar regions are the area above the 66.5° latitude in the Northern and the Southern Continent



→ Polar Regions of Earth

Environmental threats for Polar regions

- Global warming
 - Sea level rising
 - Melting of glaciers
- leading to environmental threats in Arctic & Antarctica

Arctic Regions - Accentuated threats

↳ Arctic region comparatively has higher vulnerability compared to Antarctica.

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↳ Reasons for the accentuated threat

→ Arctic region is comprised of
Seas and Oceans eg: Arctic Ocean; whereas,
Antarctica is a continent.

→ Arctic region more closer to global
north, and, hence direct impact of
anthropogenic activities.

→ Arctic region is densely populated
compared to Antarctica.

→ Arctic region - vested mineral
interests (eg: Arctic oil & natural gas),
whereas, mining is banned in Antarctica.

→ Arctic region is a major shipping
lane, hence, vulnerable to marine
pollution.

→ Antarctica Treaty, 1950 preserves the
Antarctica, whereas, Arctic region has
no such treaties for protection.

→ Arctic receives more solar insolation compared to
Antarctica.

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Measures to protect Arctic Ecosystem:

- ↳ Banning of unsustainable shipping and mineral mining in the region.
- ↳ Protection to indigenous communities inhabiting the region. Eg: Inuits of Greenland.
- ↳ Unsustainable fishing practices like seafloor dredging must be prohibited.
- ↳ Paris peace agreement — Zero Carbon emissions by 2050 must be enforced.
- ↳ Stockholm convention on POP must be implemented.
- ↳ Arctic Ocean must be declared a marine protected zone.
- ↳ Countries must adopt internally recognised treaties for preserving Arctic region on similar lines to the Antarctica Treaty, 1959.

Arctic region represents global hotspots for the world. The entire region must be protected as it is a carbon sinkhole for the earth. India's National Arctic Policy is in the right direction as it promotes sustainability to the region.

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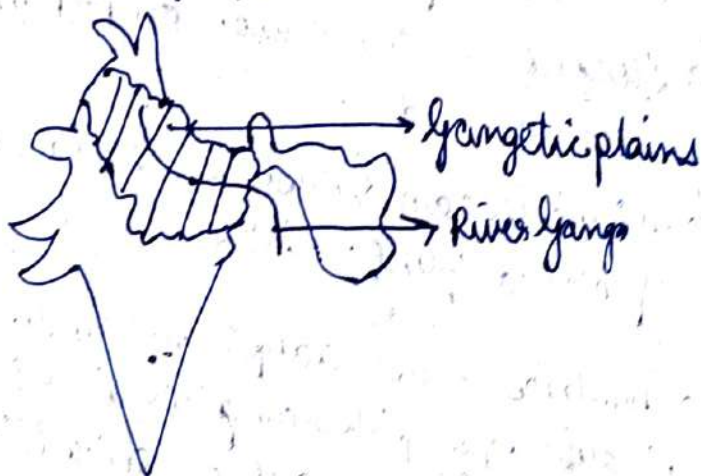
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15

Explaining the formation of Great Northern Plains of India, describe its physiographic divisions and their important characteristics

The Great Northern Plains are the rich alluvial floodplains of the Indian subcontinent formed by depositions of Ganges and its tributaries.



↑ Great Northern Plains of India

Formation of Great Northern Plains

→ The rivers of Ganga, Yamuna, Kosi, Ghaghra and so on carry enormous sediments due to widespread

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कृपया इस स्थान में प्रश्न संख्या के अनिवार्य रूप से लिखें।

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erosion while flowing in its upper course along the Himalayas.

→ These sediments get deposited along the floodplains, when, the river floods annually.

→ Over the vast years, these deposits led to the formation rich alluvial plains of India.

Physiographic divisions of Northern Plains

Punjab Plains: Drained by the 5 rivers -
Ravi, Chenab, Beas, Sutlej, Jhelum.

Uttar Pradesh Plains: Drained by Ganges and its tributaries Yamuna, Gomati.

Bihar Plains: Kosi, Ghaghara, Son are important tributaries.
They are very prone to flooding.

Bengal Plains: Represents lower course of the Ganga, which splits into Hooghly and Padma, ultimately draining into Bay of Bengal.

Characteristics of the Great Northern Plains

- ↳ Rich alluvial flatlands
- ↳ Absence of hilly terrains, relief features
- ↳ Floodplains, Meandering observed
- ↳ Very wide in geographical reach
- ↳ Bhangar represents the older alluvium -
sandy and less fertile
- ↳ Khadar represents the newer alluvium -
clayey and very fertile

The great northern plains is
a very important region as it
supports millions of population
and provides food - water.

It is rightly called "Food basket
of India"

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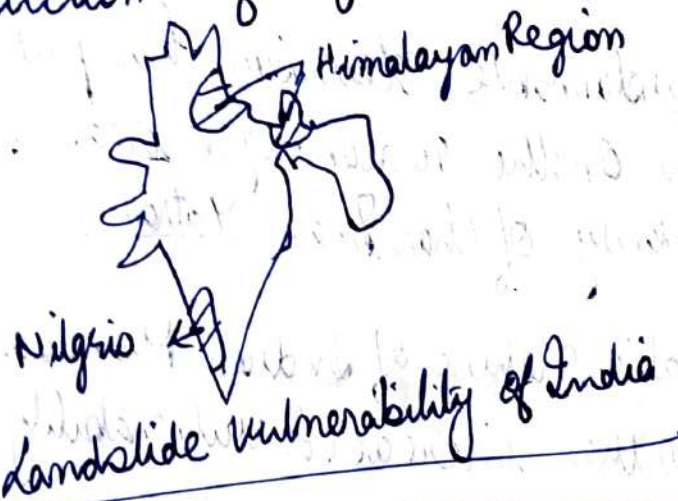
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16

In recent years, Uttarakhand & Himachal Pradesh, have witnessed an alarming increase in the rates of landslides. Discuss the reasons for such increase and suggest remedial measures.

Landslides is the sudden, abrupt movement of the top layer of the soil leading to widespread destruction of life and property.



Landslide - Uttarakhand and Himachal

↳ Rise in vulnerability of these states

Primary Reasons

↳ Indiscriminate human construction
eg. Shimla is now regarded as "concrete jungle".

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कृपया इस स्थान पर प्रश्न संख्या के अतिरिक्त कुछ न लिखें।

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उम्मीदवारों को इस हारा में नहीं लिखना चाहिए
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- ↳ Enormous dams, hydro-electric projects.
eg: Ganga-Jehli Dam (Uttarakhand)
- ↳ Increase in deforestation along the Himalayan alpine forests and temperate forests.
- ↳ Incessant road constructions using coal tar, asphalt.
- ↳ Unsustainable tourism has put a stress on the region. eg: Increase in popularity of Char Dham Yatra.
- ↳ Erotic nature of Indian Monsoons has further increased vulnerability.

Remedial Measures for Preventing Landslides

- ↳ Focus on building sustainability in human settlement, construction.
eg: environment friendly locally available materials must be used for construction (Bamboos).

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→ Sustainable Tourism must be encouraged
eg: National policy on promoting sustainable tourism must be adopted.

→ Dams, large infrastructure projects must be implemented only after clearances from Environmental Impact Assessment.

→ National Mission on Sustaining Himalayan Ecosystem must be developed further.

→ Afforestation projects must be taken up. eg: National mission for Green India.

→ Recommendations of Gadgil committee and Kasturirangan Committee must be adopted.

The himalayan regions of Himachal and Uttarakhand must be protected.
Ministry of environment and climate change, along with, NGT must take pro-active states along with NDMA to curtail landslides in the region.

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कृपया इस स्थान में प्रश्न संख्या के अतिरिक्त कुछ न लिखें।

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17

Haphazard growth and poor management make the Indian cities the locus of disasters, both big and small. Comment. Also, discuss the current gaps in policies in addressing these challenges.

Around 33% of Indians live in cities currently, which is expected to rise to 55% by 2050.

Indian cities $\leftarrow$ $\begin{matrix} \text{Haphazard growth} \\ \text{Inadequate planning} \\ \text{No proper management} \end{matrix}$ $\rightarrow$ Hotbeds for Disaster

$\rightarrow$ Packed spaces, dense populations,
Lack of disaster resilient infrastructure

have tremendously increased

Vulnerability of Indian cities towards disasters both major and minor ones

eg: Chennai Urban floods, Kolkata Amphan Cyclone, Latent Earthquakes

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Laps in policies for Urban disaster Mgmt.

↳ The NDMA Act, 2009 empowers the Central and State governments, but there is very little devolution of powers for disaster management to Urban Local Bodies.

↳ There is lack of developmental plans for the expanding cities, which, has led to development of slums, narrow congested lanes, absence of supporting infrastructure (hospitals, fire stations)

↳ NO planning — Lack of policy towards maintaining urban environment sustainable
eg. Incessant cutting of trees to promote and build urban infrastructure.

↳ Thus, we observe lapses in policy making among major

Ministries —
[Mo of Home Affairs (NDMA)
Mo of environment, forest, climate change
Mo of Urban development and Housing

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कृपया इस स्थान
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Wayforward

- ↳ Urban development authorities comprising of all stakeholders must be developed.
- ↳ Focus on building disaster resilient infrastructure must be ensured.
- ↳ Sendai framework recommendations must be adopted.
- ↳ Science & technology reforms must be adopted in disaster management.
Eg: IFLOWS adopted in Chennai & Mumbai to control urban floods.
- International best practices must be adopted. eg: Tokyo earthquake relief and evacuation model to be adopted.
- Recommendations of 2nd ARC committee report on disaster management must be implemented.
- With rising migration from rural areas, the vulnerability of cities must be curtailed to ensure minimum loss to property & lives from disasters.



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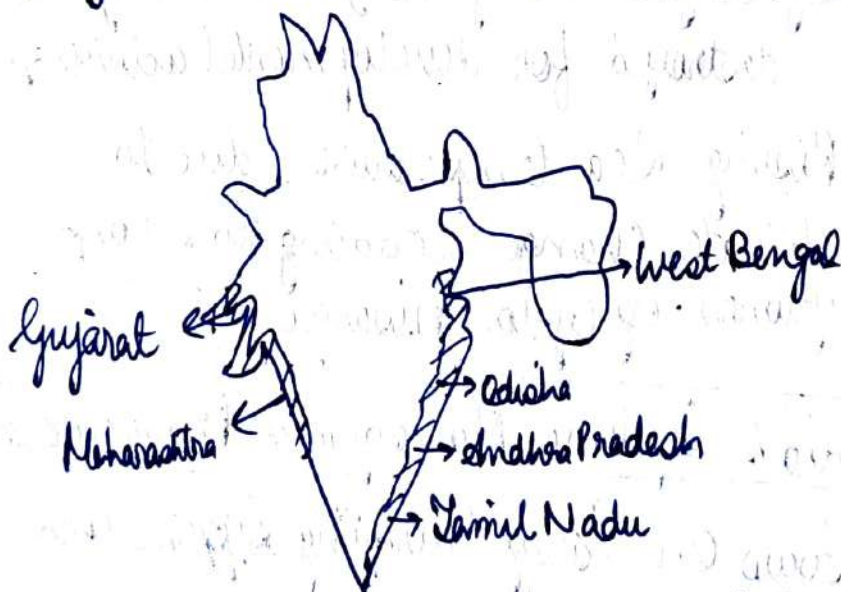
18

What are the reasons behind the vulnerability of coastal areas to cyclones in India. In this context, critically discuss India's cyclone management framework.

Cyclones are areas of low pressure zones surrounded by areas of high pressure zones. They are associated with very high speed winds and very heavy rainfalls.

Vulnerability of coastal areas in India

The entire East coast of India & Gujarat - Maharashtra Coast on Arabian Sea are highly vulnerable to cyclones.



↑ Cyclone vulnerable regions of India

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Reasons behind the Vulnerability in Bay of Bengal

- ↳ Bay of Bengal more vulnerable than the Arabian Sea.
- ↳ Higher Temperatures in the Bay of Bengal
- ↳ Bow Shaped Arc of the Eastern Coast
- ↳ Cyclones travel from East to West in the northern hemisphere.

Vulnerability in the East & West Coast

- ↳ Higher Concentration of population along the coastlines - Gujarat, Maharashtra & the East coast.
- ↳ Destruction of mangroves forest
eg: Gujarat mangroves, Odisha mangroves destroyed for developmental activities.
- ↳ Rising Sea temperatures due to climate change leading to stronger cyclones. eg: Cyclone Nisarga.

India's Cyclone Management Framework

- ↳ Focus on Early Warning System and dissemination of information via radios, local channels.

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- Disaster resilient infrastructure built in vulnerable areas - eg: Odisha.
- Post disaster recovery via NDRF, local authorities and district administration
- Cyclone Management framework in India has reduced loss of lives in India.
eg: Cyclones in Odisha would kill lakhs in 1990s, but, now deaths due to cyclone drastically reduced to single digits.
- Post disaster recovery, infrastructure building happens on war-footing.
However, due to greater intensity and frequency of cyclones occurring, the Cyclone management framework of India must be revamped to ensure zero-loss via further devolution of power to local authorities (Gram Sabhas, ULBs) and adoption of science and technology. The recommendations of the 2nd ARC report on disaster risk reduction must be implemented further.

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19.

To build greater resilience among communities, it is important to avoid looking at disaster events in isolation and under the interconnections between global disasters. Elaborate, with examples.

Disaster resilience means building of capacity and ability among the vulnerable population to ensure sustainability and protection from disasters.

Disasters - interconnected and not isolated

↳ Disasters are a global phenomenon, as they are interconnected with each other.

Eg. In Sumatran Earthquake resulted in the great Indian Tsunami (2004)

↳ Disasters set off a chain of reactions which lead to a domino effect.

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eg: The great Japan Earthquake (2011) led to the Pacific Ocean Tsunami and further lead to Fukushima Daiichi Nuclear meltdown.

→ The geographic nature of the Earth is such that all the regions are ~~not~~ related directly or indirectly
eg: Volcanic eruptions in Hawaii and Iceland are often simultaneously observed.

→ The amazon wildfires lead to apocalyptic situations worldwide.

→ The melting of Arctic Oceans has lead to increase in heatwaves, droughts worldwide.

→ The Australian wildfires in 2021, was, associated with floods in India due to excessive monsoon.

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→ The Corona Pandemic has cemented the fact that disaster events are globally interconnected and not isolated events.

Wayforward

↳ Focus must be made on international disaster resilience infrastructure.
eg: Coalition for disaster Resilience (CDR)
led by India

↳ International common standards must be followed. eg: Sendai framework on disaster

↳ International environmental commnt
commitments must be upheld. eg: Paris
Peace agreement, Stockholm convention.

↳ Multilateral Organisation Mechanisms like BRICS disaster resilience, SCO Disaster
reduction Coalition must be encouraged.

Resilience to disaster and reduce
vulnerability is the only wayforward
for the humanity. It will help us
achieve the SDG 11.

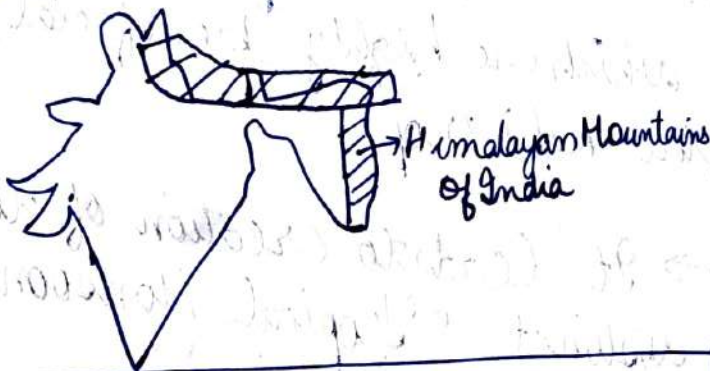
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20) How does the Himalayan mountain range shape the climate of the Indian subcontinent? Also, discuss the impact of the warming of the Himalayas on the Indian subcontinent.

The Himalayan mountain ranges are the young fold mountains created when the Indian plate collided with the Asian plate.



Himalayan Mountains - Indian Climate

↳ Regulate the Indian Subcontinent's Climate.

↳ Acts as a mighty barrier preventing cold winter winds from Siberia to reach Indian plains.

Hence, prevents, bitter cold in winters.

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→ Prevents Monsoon winds from escaping the Indian subcontinent. Without, Himalayas, Indian subcontinent would be a dry desert.

→ It intercepts the westerly disturbances in winters, causing winter rains which are highly beneficial for the Rabi crops.

→ It leads to creation of the distinct "Tropical Monsoon Climate" of India.

Impact of warming of the Himalayas

↳ Due to the suspended particulate matters, increased greenhouse emissions Himalayas are melting.

↳ It will lead to flooding in the northern plains.

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कृपया इस स्थान
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→ Destruction in the Himalayan States by landslides, flashfloods and glacial lake outbursts.

→ Will lead to drier, warmer summers causing heatwaves, droughts.

→ Will harm the food security of the vast Indian population.

Thus, the Himalayas play a pivotal role in the protection of the Indian Subcontinent from the perils of harsh weather.

The national mission on sustaining the Himalayan ecosystem is in the right direction to preserve and protect the fragile geographical region.