

TEST CODE : 5 1 0 3 2

# ForumIAS

## GENERAL STUDIES

Name Of Candidate	PRIYA RANI	Date:	
Roll No.	1910092943		

Time Allowed: Three Hours

Maximum Marks: 250

INDEX TABLE			INSTRUCTION		
Q. No.	Max. Marks	Marks Obtained	1. Please do furnish Name, Email, Roll No and Mobile in the answer sheet.		
1			2. There are TWENTY questions printed in ENGLISH & HINDI, all questions are compulsory.		
2			3. The number of marks carried by a question/part is indicated against it.		
3			4. Answers must be written in the medium authorized in the admission Certificate, which must be stated clearly on the cover of this Question-Cum-Answer (QCA) Booklet in the space provided.		
4			5. Word limit in questions, if specified, should be adhered to. Any page or portion of the page left blank in the Question-Cum Answer Booklet must be clearly Struck off.		
5			<b>Any specific messages for ForumIAS Mentors/ Evaluators with respect to your copy? Write it here.</b>		
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Total:	250				
Evaluator's Discretion:			<b>For Student Only</b>		
			Start Time   9 am	End Time   12 pm	
Total Marks:			Mode Of Examination:	Online <input checked="" type="checkbox"/> Offline <input type="checkbox"/>	
Evaluator's Discretion: This is the marks awarded at the discretion of the evaluator based on your overall impression, on the basis of (but not limited to) your handwriting, presentation, use of diagrams, flowcharts, facts and figures or absolutely anything that he/she liked in your copy.			<b>For Office Use Only</b>		
			ECN CODE:	EG:	Evaluation Date:

**Note:** You can discuss your evaluated copy with the Mentor. Raise a ticket from your portal to schedule a mentor call or visit the offline centre to meet mentor (all 7 days, Timings – 11 AM to 6 PM). Further if you are unsatisfied with the evaluation, you can seek re-evaluation of the copy.

Parameters	Excellent	Very Good	Good	Average	Poor	Very Poor
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Presentation						
Handwriting						
Content						
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**ADDITIONAL REMARKS**

Q.1) Why did Indian rulers fail to defend their kingdoms against foreign invaders during early medieval period? (10 marks, 150 words)

प्रारंभिक मध्ययुगीन काल में भारतीय शासक विदेशी आक्रमणकारियों से अपने राज्यों की रक्षा करने में विफल क्यों रहे? (10 अंक, 150 शब्द)

Foreign invasion started around 11<sup>th</sup> century in Indian subcontinent, the first being Ghazni who looted India 16 times.

Reasons why Indian rulers failed to defend their kingdom against foreign invaders:

1. lack of unity among various rulers.
2. Defeat of Prithviraj Chauhan during 2nd battle of Teraian opened India to more foreign invasion.
3. Use of more sophisticated artilleries and weapons.

4. Use of horses etc which helped.
5. Highly strong, disciplined and ruthless army of invaders.
6. They were not rulers, but occupiers and looters and thus lack of ethics in warfare.
7. Use of deceit and divide & rule policies

Though Indian rulers were brave and well equipped but more as a divided and not united one to protect motherland from foreign invasion.

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Q.2) Write a note on evolution and significance of the slogan "Jai Jawan Jai Kisan Jai Vigyan".  
(10 marks, 150 words)

"जय जवान जय किसान जय विज्ञान" के नारे के उद्भव और महत्त्व पर एक नोट लिखें। (10 अंक, 150 शब्द)

The slogan of 'Jai Jawan, Jai Kishan' was given by Lal Bahadur Shastri and 'Jai Vigyan' added by Atal Bihari Vajpayee.

### Evolution of The Slogan

#### 1. Jai Jawan

- In backdrop of wars like 1962 war with China and 1965 war with Pakistan

#### 2. Jai Kisan

- Food shortages → due to low productivity
  - ↳ Stopping of food aid by US (PL-480) due to Shastri ji criticism of Vietnam war.
  - ↳ Drought years.

3. Jai Vigyan

↳ in light of 1998 Pokhran test conducted successfully making India a nuclear weapon state.

Significance:

1. 'Jai Jawan' motivated our soldiers towards victory in 1965 war with Pakistan.
2. 'Jai Kisan' → brought green Revolution making India self sufficient in foodgrains.
3. Jai Vigyan → CSIR, Atomic Research under Homi Bhabha, ISRO every year new feet is representation of Jai Vigyan.

Slogans like these help motivate the demotivated population and help achieve new heights for the country. Slogans backed by good leadership + mass action is always beneficial.

Q.3) The Shimla Agreement reads more like a communiqué than a peace agreement. Critically analyze. (10 marks, 150 words)

शिमला समझौता शांति समझौते से अधिक एक सरकारी विज्ञप्ति की तरह है। समालोचनात्मक विश्लेषण करें।

(10 अंक, 150 शब्द)

Shimla agreement was signed in 1972 by Indira Gandhi & General Ayub Khan after 1971 Bangladesh war.

Shimla agreement - more like communiqué:

1. Return of 90,000 prisoners of war unconditionally due to growing international pressure  
eg: China veto to not recognise Bangladesh.
2. Not accepting LOC as international boundary. LAC was still the boundary.
3. Inability to resolve the Kashmir disputes.
4. Returning back strategic points acquired.

But Shimla agreement was also trying to bring peace - so is also a peace agreement:

- 1) Bilateral resolution of disputes and no external/international influence.
- 2) Mutual understanding & dialogue
- 3) Not being too harsh on Pakistan (like Treaty of Versailles for Germany) - thus leaving scope for cooperation in future.
- 4) Keeping alive the hope of return of democracy in Pakistan.

Thus Shimla agreement might seem a lost opportunity, but it has also kept a check on Pakistan perceiving the issues of Kashmir internationally (eg: after 370 abrogation).

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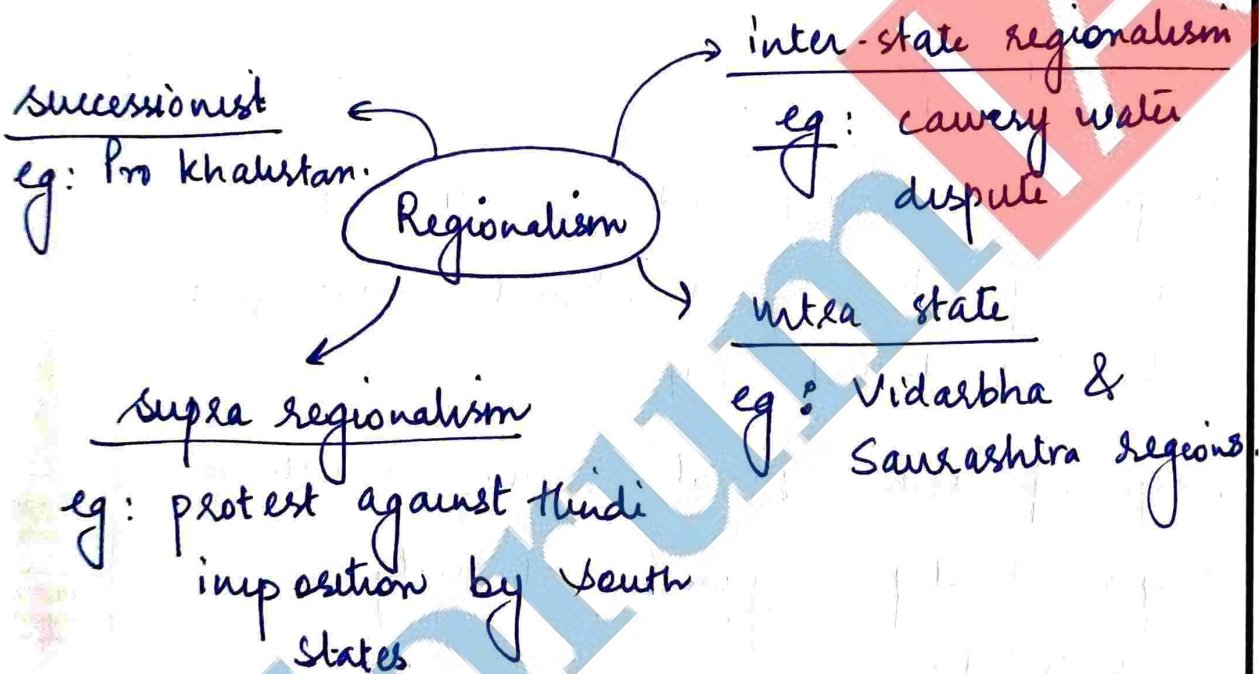
Q.4) Why is regionalism considered a "double-edged sword" for national unity and integration?

(10 marks, 150 words)

राष्ट्रीय एकता और एकीकरण के लिए क्षेत्रवाद को "दोधारी तलवार" क्यों माना जाता है?

(10 अंक, 150 शब्द)

Regionalism is a feeling prioritizing regional interest and sentiments over sometimes over national interest.



Regionalism acts as a double edged sword for National unity :

1st edge - Negatives

- Disturbs social cohesion b/w different regions

- Demand for newer states - DOMINO effect  
eg: Telangana, Jharkhand.
- Rise of vote bank & regional politics  
eg: DMK manifesto in initial days.
- Prioritising regional issues over national interest.

### 2nd edge - Positives

- ① Helps in development of all regions  
eg: separation of Jharkhand  $\Rightarrow$  more focus on tribal welfare.
- ② Helps protect regional language & culture
- ③ Helps develop regional solidarity & brotherhood.

Regionalism was a direct consequence of formation of nation state. But how regionalism will impact unity depends how it is tapped,

Q.5) Warmer waters of Bay of Bengal are typically more prone to cyclones than the cooler and calmer Arabian Sea, but the trend seems to be changing. (Examine) (10 marks, 150 words)

बंगाल की खाड़ी के गर्म पानी में आमतौर पर ठंडे और शांत अरब सागर की तुलना में चक्रवातों का खतरा अधिक होता है, लेकिन प्रवृत्ति बदल रही है। परीक्षण कीजिए। (अंक 10, शब्द 150)

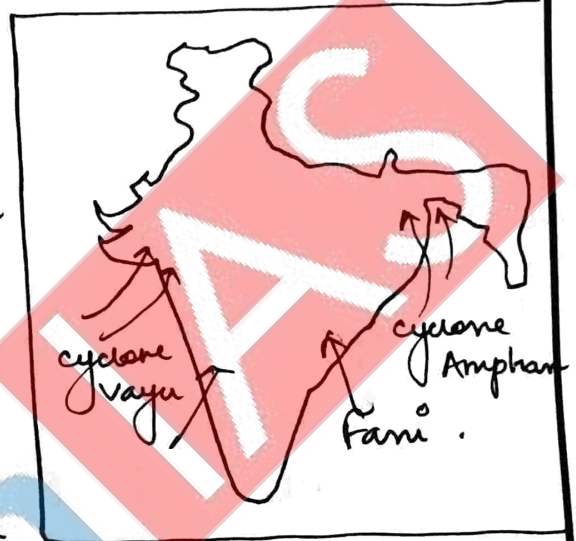
Tropical cyclones are formed when high temperature, Coriolis force and low pressure is formed.

Why more cyclones in Bay of Bengal region:

1. More sea surface temperature.
2. More rivers fall in Bay of Bengal so constant supply of fresh water.
3. Cyclonic low pressure depression formed easily.
4. Cyclonic condition in Pacific also get up to Bay of Bengal.

## Increasing trend of cyclone in Arabian sea:

1. Events like El-Nino which affect warming of seas.
2. Cyclone with double strength are formed as they are travelling more.
3. Cyclonic tendencies in the Pacific regions & Philippines depression now also reach the Arabian sea.
4. Climate change & thus changing pattern of events.



To tackle more cyclonic events with increased global warming early warning system must be strengthened & quick evacuation and relief work must be carried.

Q.6) Explain the critical role of different jet streams in Indian monsoon.

(10 marks, 150 words)

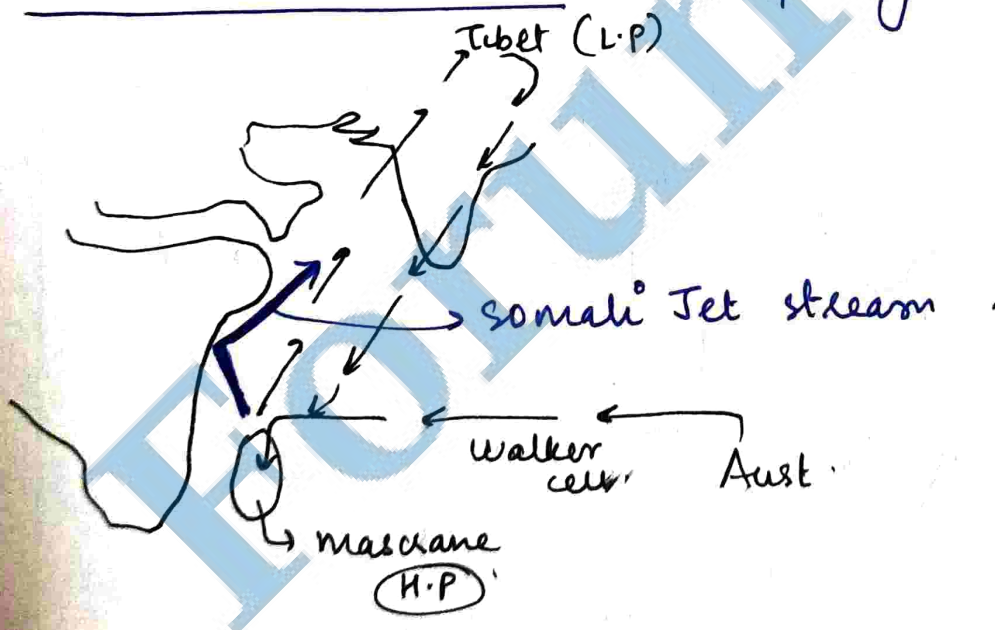
भारतीय मानसून में विभिन्न जेट धाराओं की महत्वपूर्ण भूमिका की व्याख्या करें।

(अंक 10, शब्द 150)

Indian monsoon occurs due to seasonal reversal of winds due to movement of ITCZ. Apart from that other factors also affect our monsoon.

Role of different jet streams in Indian monsoon

1. Somali Jet stream (Temporary)



These jet stream push more tropospheric winds towards the Tibet region & thus aid creating L.P. at the surface.

## 2. Easterly jet stream.

This occurs when S-W monsoon ends and time of N-E monsoon occurs.

This helps bring rain in Tamil Nadu.

## 3. Westerly jet streams.

These when move north of Himalayas → then it marks beginning of monsoon

& when it moves south of Himalayas (in the plains) then marks break in monsoon.



Based on above factors our monsoon is predicted by IMD. If El-Nino events do not occur then in general our monsoon is normal.

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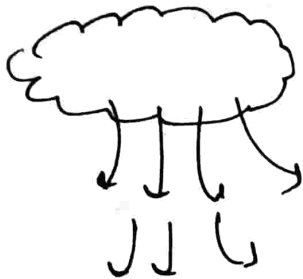
Q.7) How is a flash-flood different from a flood? Highlight the actions that can be taken to manage and minimize the impact flash floods.

(10 marks, 150 words)

एक अचानक आई बाढ़ (फ्लैश-फ्लड) बाढ़ से कैसे भिन्न होती है? फ्लैश फ्लड के प्रभाव को कम करने और प्रबंधन करने के लिए की जाने वाली कार्रवाइयों पर प्रकाश डालिए।

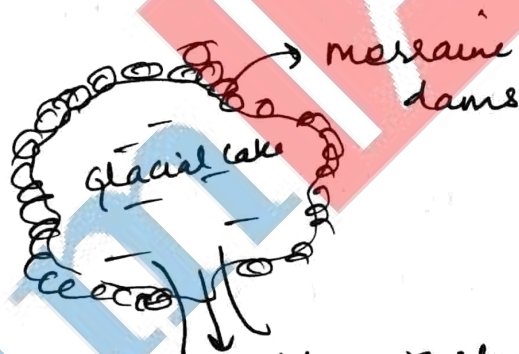
(10 अंक, 150 शब्द)

Flash flood is sudden increase in downpour due to cloud burst or glacial lake outburst etc.



Cloud Burst

Flash flood - eg  
Uttarakhand flood.



Glacial lake outburst of flood.

The suddenness of the event & the amount of water at per unit area at a given time is the basic difference between a flash flood & flood.

## Actions to be taken to manage & minimize the impact :

- ↳ Better mapping of vulnerable areas.
- ↳ early warning.
- ↳ housing which can tolerate the intensity of water.
- ↳ Sustainable development in mountain region.
- ↳ Eco-tourism.
- ↳ check for following events after that like land slide.
- ↳ Quick mobilisation of NDRF and air force for evacuation.
- ↳ Keep ready essentials like food & medicines.

Both structural & non structural measures must be taken according to NDMA guidelines to reduce the impact of floods & flash flood in particular.



Q.8) Examine the reasons for localization of software services industries in few urban centres of the country. Do you think that there is need to decentralize this industry? (10 marks, 150 words)

देश के कुछ शहरी केंद्रों में सॉफ्टवेयर सेवा उद्योगों के स्थानीयकरण के कारणों का परीक्षण करें। क्या आपको लगता है कि इस उद्योग को विकेंद्रीकृत करने की आवश्यकता है? (10 अंक, 150 शब्द)

India has maximum contribution of software services in its services export basket. But these software industries are localised in few urban centres of the country:

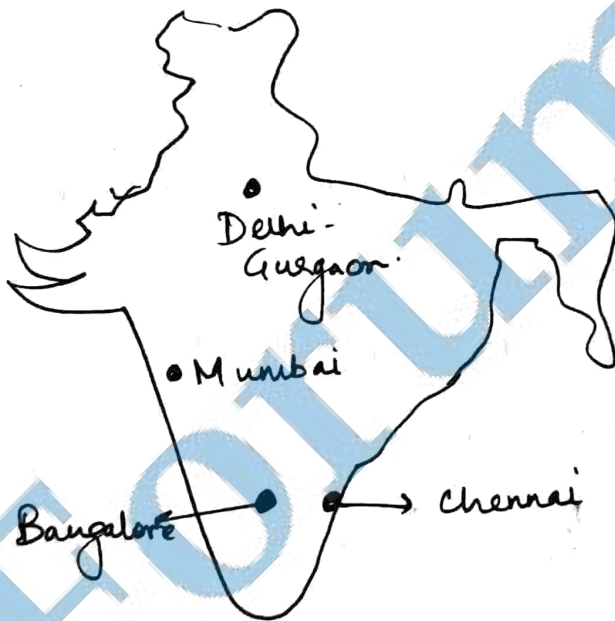


Fig: software industries.

Reasons for localisation of these industries:

1. Do not need much raw material → ∴ are footloose.
2. Good transport condition should be there. eg: Bangalore, Delhi.

3. Some require clean environment
4. Presence of skilled labour  
eg: Bangalore is hub of engineering college.
5. low cost and large land availability in these centres.  
(eg: land issues if want to set in Bihar).
6. Government policies → IT Policy of Karnataka in 1980's itself.
7. Better internet facility.
8. Cosmopolitan culture of these places.

Yes, there is a need to decentralise this industry

- ↳ to check migration
- ↳ Balanced growth and development.
- ↳ check regionalism - eg: Haryana job reservation policy
- ↳ Better utilisation of human resource available across the country.
- ↳ Strategically better to decentralise because one cyber attack or attack during war can destroy everything.

Q.9) Why has Russian Far East emerged as a region of growing interest for India?

(10 marks, 150 words)

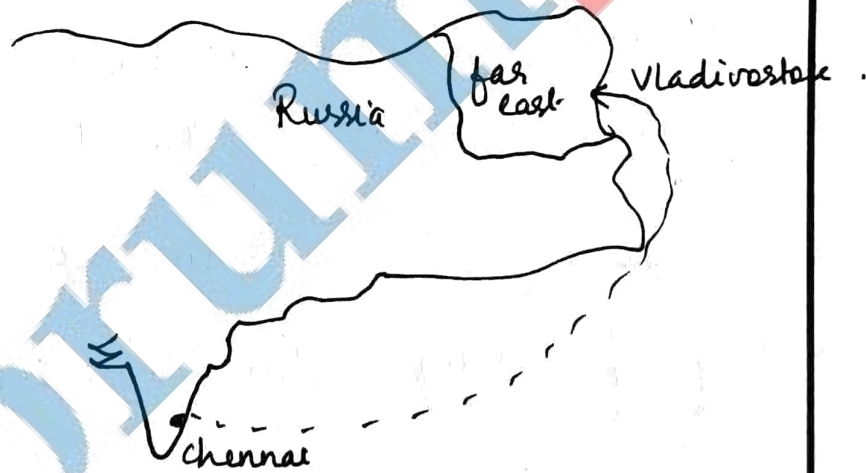
रूस का सुदूर पूर्व क्षेत्र भारत के लिए बढ़ती रुचि के क्षेत्र के रूप में क्यों उभरा है?

(10 अंक, 150 शब्द)

Indian Prime Minister was invited to  
by Russia and India has  
extended line of credit for development of  
the region.

Reasons for growing interest of India in Russian

far east:



1. China: growing presence of Chinese in the region → a concern for Russia.  
→ Also closeness between Russia & China is a concern.

2. Connectivity: Chennai to Vladivostok route will help reduce journey time by 24 hours.

3. Resources

↳ the far east region is rich in energy resource  
 ↳ so good for India's energy security.

4. Closeness to arctic region

↳ which is rising in importance for its resources & shorter connectivity route due to climate change.

5. To reinforce the importance of long standing friendship between India and Russia.

Interest in far east region is a part of larger picture of diversification of relation with Russia apart from its defence ties

Q.10) Do you agree that single minded focus on development of solar power in the country has led to neglect and underutilization of other renewable energy sources? Justify.

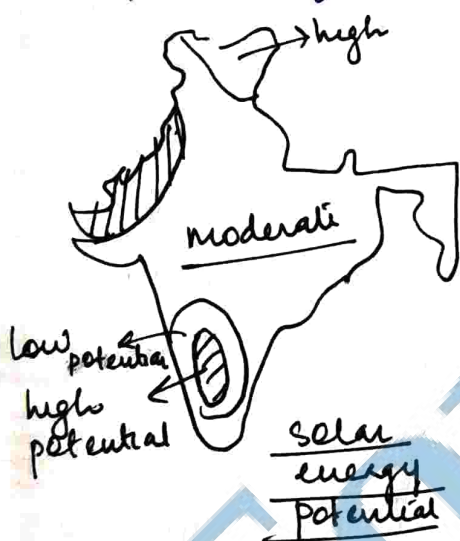
(10 marks, 150 words)

क्या आप इस बात से सहमत हैं कि देश में सौर ऊर्जा के विकास पर एकल रूप से ध्यान केंद्रित करने से अन्य नवीकरणीय ऊर्जा स्रोतों की उपेक्षा हो रही है और उनका क्षमता से कम उपयोग हो रहा है? औचित्य सिद्ध कीजिए।

(अंक 10, शब्द 150)

India imports 86% of its energy requirements and also pays huge import bill. Thus diversification is demand of present day.

Development of solar power in the country:



- Target of 175 GW of Renewable → out of which 100 GW from solar by 2022

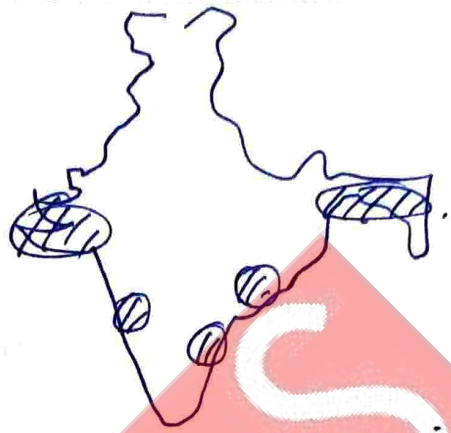
75 GW 25 rooftop  
Grid connected.

- National solar mission, solar parks etc.
- ISA, OSOWOQ, Green Grid etc.

These steps have led to reduced cost of solar energy in the country.

⇒ But it is alleged that this has led to neglect of other renewable energy sources:

1) Shale gas  
 ↓  
 low tech development  
 ↓  
 ∴ low exploration unlike countries like USA.



2) Natural Gas → only 7% share in energy while this is more cleaner than fossils.

3) Wind energy  
 ↓  
 4th largest in world, but still below potential



4) Hydro-electricity → less dams construction now compared to earlier 5 year plans.



5) Nuclear energy → still in stage 1 of our nuclear energy program.

India needs to diversify its renewable energy base to meet its Panchamrit targets & to ensure energy security.

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Q.11) Accounts given by foreign travelers are as important as the evidence obtained from inscriptions and coins in reconstruction of ancient Indian history. Elaborate with examples.

(15 marks, 250 words)

विदेशी यात्रियों द्वारा दिए गए वृत्तांत उतने ही महत्वपूर्ण हैं - जितने कि प्राचीन भारतीय इतिहास के पुनर्निर्माण में अभिलेखों और सिक्कों से प्राप्त साक्ष्य। उदाहरण सहित विस्तृत व्याख्या करें।

(अंक 15, शब्द 250)

Indian ancient history is reconstructed based on various evidences from excavation, inscription, coins, seals and also foreign travellers.

### Evidence from inscriptions

#### 1. Ashokan inscription

↳ Kalinga inscription ⇒ about Kalinga war

↳ Maski inscription ⇒ contained name Ashoka.

↳ Kalsi inscription ⇒ had all 13 edicts of Ashoka.

2. Allahabad pillar inscription → by Harisena Prashasti of Samudragupta - tells about him.

3. Aihole inscription → Talks about defeat of Harshvardhana by Chalukyas.

4. Nasik inscription
5. Pulalua inscription → Talks about southern kingdom of cheras & cholas.

### Evidence from coins

1. Punch marked coins from 4th century BC.
2. Gold coins
  - ↳ introduced by Indo-Greeks.
  - ↳ maximum during Kushana rule.
  - ↳ images of king, god etc.
3. Gupta coins → gold coins → very high purity → tells about economic prosperity during.
4. later Guptas → use of copper coins → decline of economy.

### Evidences from foreign travellers:

1. Megasthenes → The Greek ambassador during Magadh rule
  - ↳ wrote Indica and details about Chandragupta Maurya rule.



2. Fa Hien → came to India during the Guptas, basically Chandragupta - 2. He wrote about the decline of Buddhism & more attention to Brahmanism during the phase.

3. Hien Tsang → During Harshvardhana  
↳ Talks about Ujjain and Kanauj assemblies (Buddhist) of Harsha.

4. Plateny: Wrote about Indo-Roman trade in the ancient time.

Coins, inscription & foreign accounts must be preserved to better understand our history. National Museums and National Manuscript missions are step in this direction.

**Feedback**

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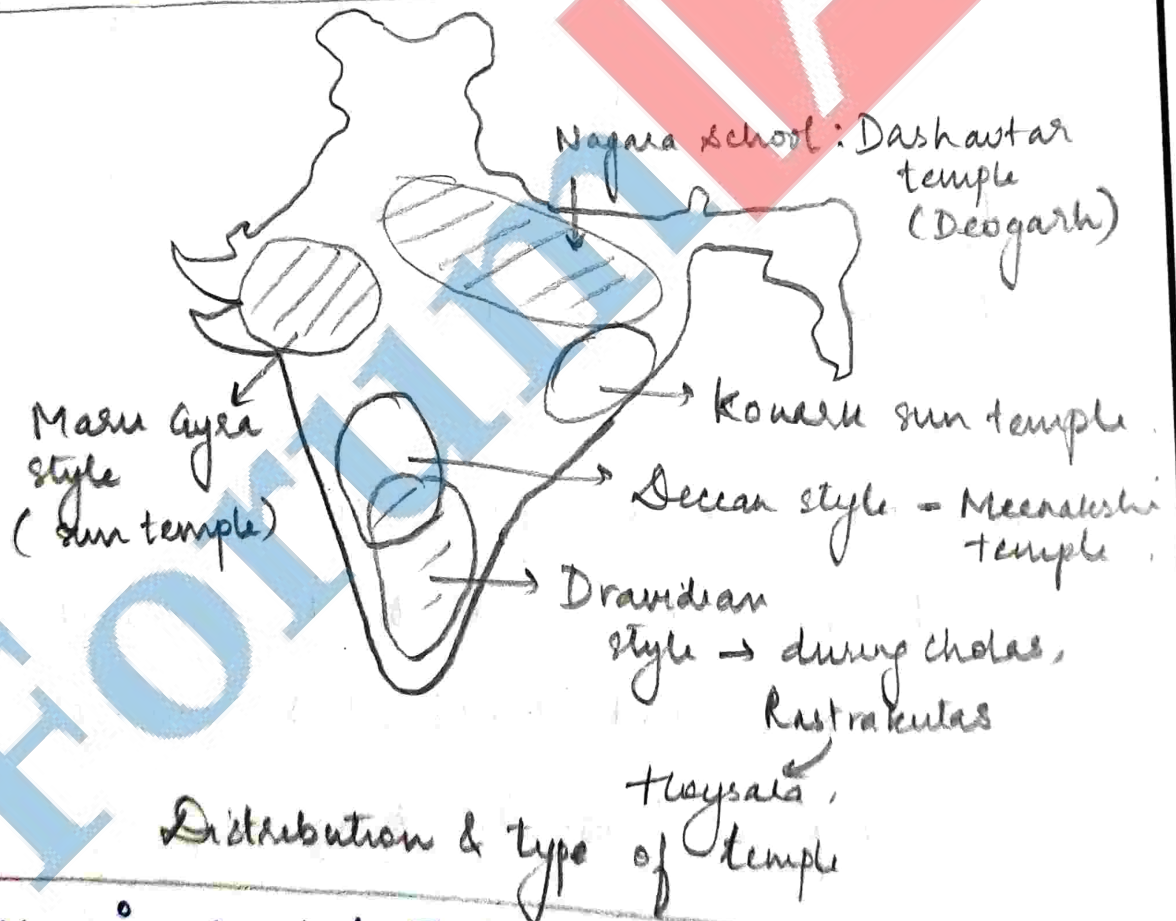
Q.12) Temples of ancient India were not just places of worship but centres of socio-economic life of people. Discuss.

(15 marks, 250 words)

प्राचीन भारत के मंदिर न केवल उपासना स्थल थे बल्कि लोगों के सामाजिक-आर्थिक जीवन के केंद्र भी थे। चर्चा करें।

(15 अंक, 250 शब्द)

Different form of Temples developed during ancient India - from Nagara style, dravidian style, Hoysala, deccan etc.



Temples in ancient India served as a places of worship:

- 1) For Jains: Dilwara temple (Rajasthan)  
Pawapuri.

- 2) For Hindus
- Uttalswamy temple. (Vishnu)
  - Kedarnath temple (Shiv)
  - Kamakshya temple
  - Shakti peeth and 12 jyotirlingas

But temples were also centres of socio-economic life of people:

1. Social gathering of people to celebrate important festivals.
2. As a symbol of power for kings.
3. Source of revenue as many donations flowed.
4. Treasuries are present in these temples which attracted invaders  
eg: Somnath Temple.

5. Temples were also centre of learnings of religious texts - Vedas (GHATIKAS).
6. Helped in oral transmission of knowledge.  
eg: through Upanishadic stories.
7. Dances were also performed - Devdassas.  
eg: Odishi dance.
8. Temples like Laxman temple speak about outlook of ancient Indians towards today taboos topics. (Mithuna art)
9. These were first to be destroyed whenever power play was there.

Thus the architectural marvel of Indian temples must be preserved and protected so that every generation learns about its importance.

Q.13) How far do you agree that imposition of emergency in 1975 was necessary to preserve security and integrity of the country? What lessons did the emergency offer for the nation?

(15 marks, 250 words)

आप कहाँ तक सहमत हैं कि देश की सुरक्षा और अखंडता को बनाए रखने के लिए 1975 में आपातकाल लगाना आवश्यक था? आपातकाल ने देश के लिए क्या सबक दिए?

(अंक 15, शब्द 250)

Emergency was imposed in 1975 by then PM Indira Gandhi when already one emergency was proclaimed due to India-Pak war (1971).

There were several reasons to impose emergency - preserving security & integrity was only one among them.

- 1) economic reason → industrial disputes
  - ↳ Railway strikes - which could paralyse the nation
  - ↳ Recession, inflation and high unemployment
  - ↳ Food shortages - drought year 1971-72
    - ↳ stopping of food aid by US.
  - ↳ diversion of resource towards war in light of 1971 war.

Judiciary

- ↳ promoting judges without consideration of seniority (AN Ray case)
- ↳ Allahabad high court judgement in Raj Narayan case invalidating Mrs. Gandhi election.

Total Revolution

- ↳ JP's call for total revolution
- ↳ calling of armed forces & police to not cooperate with government.
- ↳ Student protest in Bihar & Gujarat

Due to emergency impacts

- ↳ loss of civil liberties
- ↳ suspension of Article 32
- ↳ press censorship
- ↳ compulsory vaccination etc.

Lessons from emergency

1. love of Indians for Democracy.

2. Understanding the value of civil liberties and fundamental right
3. Revision of loopholes in constitutional provision regarding emergency
  - ↳ internal emergency  $\Rightarrow$  only when armed rebellion (44th amend)
  - ↳ emergency  $\rightarrow$  only when written permission of cabinet
4. Extra parliamentary politics can distract administrative work.

Emergency is considered as darkest phase in our democracy, ~~as~~ but the good part is it made us value democracy even more.

**Feedback**

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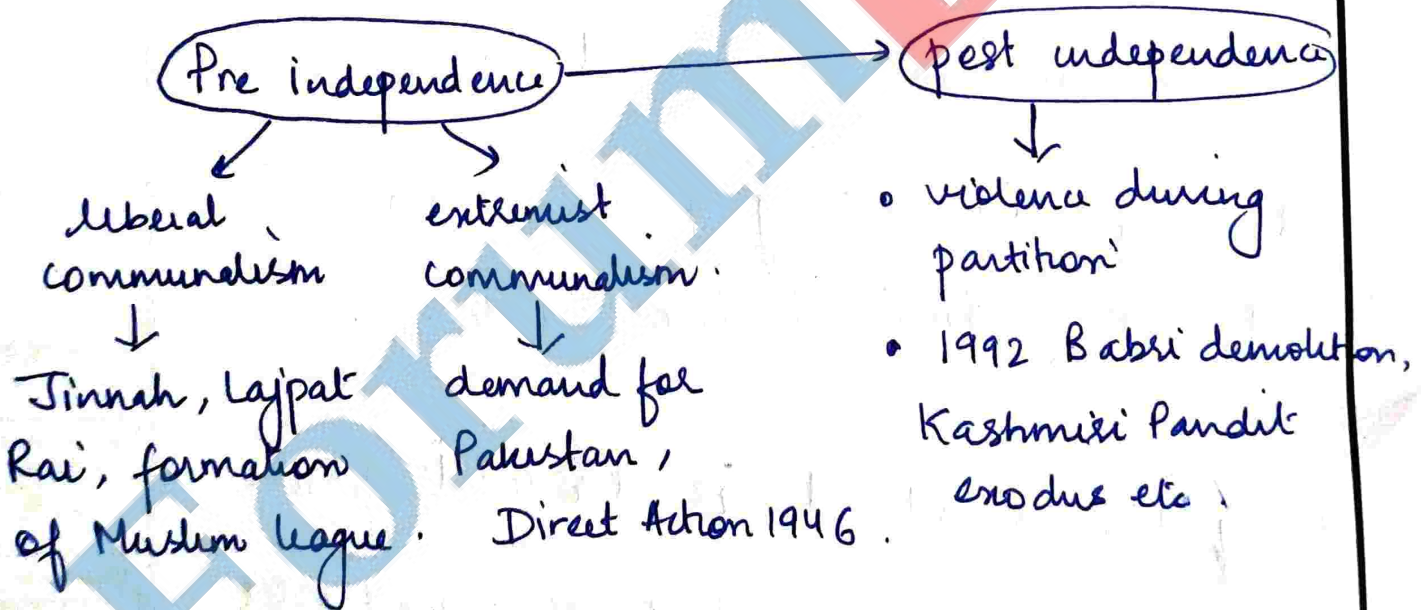
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**Q.14) Communalism is an outcome of competitive aspirations of domination and politicization of religion leading to distortions of the democratic process in the country. (15 marks, 250 words)**

सांप्रदायिकता वर्चस्व की प्रतिस्पर्धी आकांक्षाओं और धर्म के राजनीतिकरण का परिणाम है जो देश में लोकतांत्रिक प्रक्रिया को विकृत करती है। चर्चा कीजिए। (15 अंक, 250 शब्द)

Communalism in simple term means politics of Religion. Both Gandhi & Jinnah were religious men, but Jinnah became communal as he mixed religion & Politics.



communalism as an outcome of aspiration of domination:

① Pre independence:

↳ Jinnah politics of trying to lead the Muslims (sole leader).



- ↳ Branding of INC as pure Hindu organisation.
- ↳ separate electorate demand.

## ② post Independence

- ↳ Sparking of communal issues for vote bank.

- ↳ division on line of religion - leading to riots.

- ↳ Everyone trying their hand on pleasing community.

- ↳ economic competition among groups.

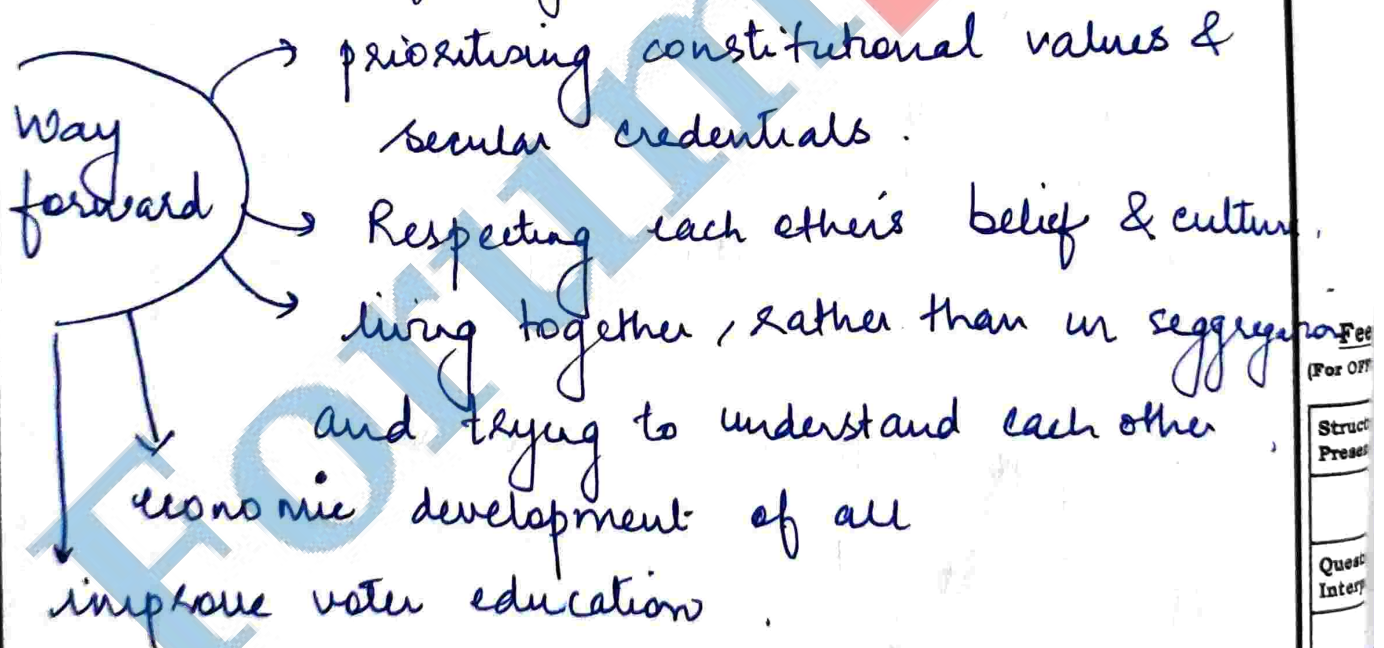
Communalism as an outcome of politicisation

of religion:

- ① Enforcing that Hindus & Muslims have different interest & cannot coexist.
- ② Raising of controversial issues  
eg: Recent Gyanvapi issue.
- ③ Disrespecting others's religion  
eg: MP's comment on Prophet on National Television.

Communalism due to above two is leading to distortion of democratic process:

- ① can hamper secular credentials
- ② Real issues like employment, environment do not find mention in electoral issues.
- ③ voting based on religious sentiments and affiliation
- ④ Issues rise to charismatic leaders.
- ⑤ Rise of majoritarianism



Q.15) Globalization offers economic opportunities and benefits, but it comes with substantial social costs and accelerated process of marginalization. Critically evaluate. (15 marks, 250 words)

वैश्वीकरण आर्थिक अवसरों और लाभों को प्रदान करता है, लेकिन यह पर्याप्त सामाजिक लागत और वंचना की तीव्र प्रक्रिया के साथ आता है। आलोचनात्मक मूल्यांकन कीजिए।

(अंक 15, शब्द 250)

Globalisation is a process of larger interconnectedness such that event in one part of the world has effects in other parts.

Economic opportunities & benefits of Globalisation:

- ① Women → jobs in MNC's (38% women representation in services : WTO report)
  - ↳ increased social mobility
  - ↳ more freedom and financial independence.
  - ↳ rise of love marriages, live in etc.
- ② Youth → more educational & job opportunities
  - ↳ greater exposure to different cultures.

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- ③ Blurring of caste lines in society.
- ④ change in family system - joint to nuclear.
- ⑤ More earning members in family - so low dependency.
- ⑥ Environment → Global cooperation.  
↳ eg: UNFCCC Paris deal, Panchamrit
- ⑦ Trade & commerce: according to comparative advantage.

social cost of globalisation & accelerated process of marginalisation:

social cost

- ↳ increase in nuclear family → No one to take care of elderly (8.6% of population)
- ↳ loss of family values → rising consumeristic society.

- ↳ environmental → pollution → freel use in shipping goods for trade.
- ↳ spread of disease is rapid - eg covid 19.
- ↳ homogenisation of culture - eg pop music everywhere.

### Marginalisation

- ↳ inter state : different level of development  
Behar vs Karnataka.
- ↳ Rural-urban : urban cosmopolitan  
↳ rural still underdeveloped.
- ↳ Between Gender : Dual burden on women  
(work + home).
- ↳ caste : privatisation & liberalisation  
thus more private jobs where no reservation for marginalised.

Thus as PM as rightly said that globalisation should not be just of trade but also convergence of global peace, environmental issue, tackling poverty & terrorism as well.

#### Feedback

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Structure/  
Presentation

Question  
Interpretation

Content

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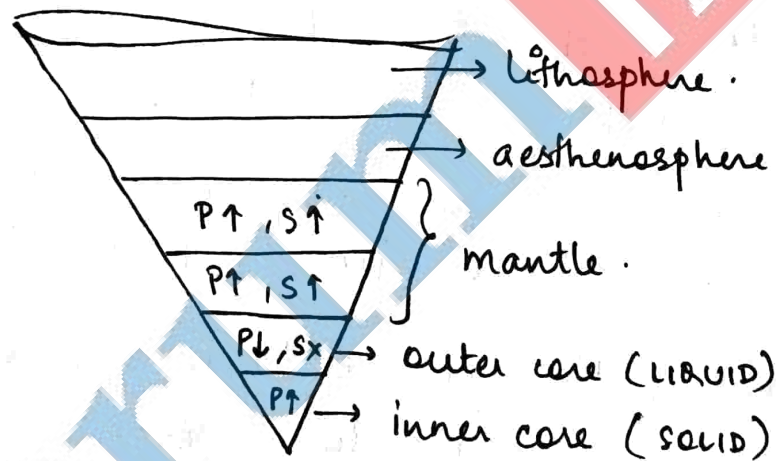
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Q.16) With the help of a neat diagram, discuss internal structure of earth. Explain how study of seismic waves helps in better understanding of earth's interior. (15 marks, 250 words)

स्वच्छ चित्र की सहायता से पृथ्वी की आंतरिक संरचना की विवेचना कीजिए। बताएं कि भूकंपीय तरंगों के अध्ययन से पृथ्वी के आंतरिक भाग को बेहतर ढंग से समझने में कैसे मदद मिलती है। (अंक 15, शब्द 250)

Earth's interior is made up of different layers - lithosphere, asthenosphere, mantle & core. Both direct & indirect methods are used in its study.



P → P wave (↑ means increase in speed)  
S → S wave.

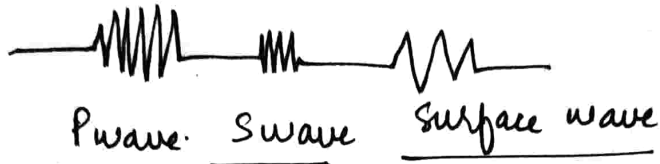
internal structure of earth

Different methods used to study interior

Direct → Drilling  
→ Volcanoes

Indirect → meteors  
→ gravitation  
→ seismic study

Study of seismic waves helps better understand the Interior of the earth



Characteristics of seismic waves

↳ P waves : passes through solid, liquid & gases

speed: solid > liquid > gases.

↳ S wave : passes only through solid

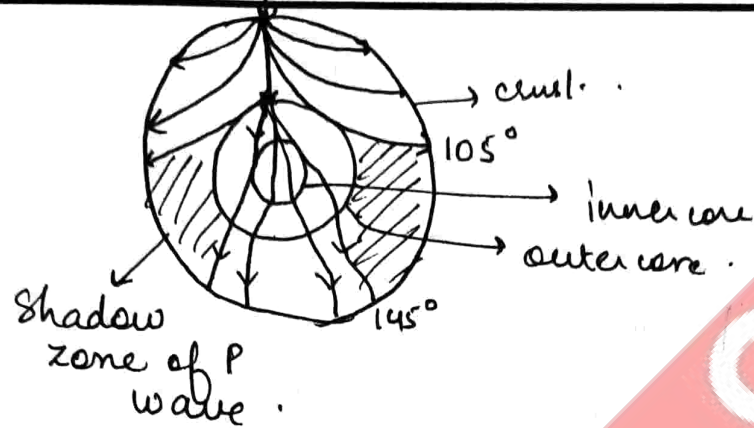
These changes occurs due to change in density of the material.

• When P waves is passed.

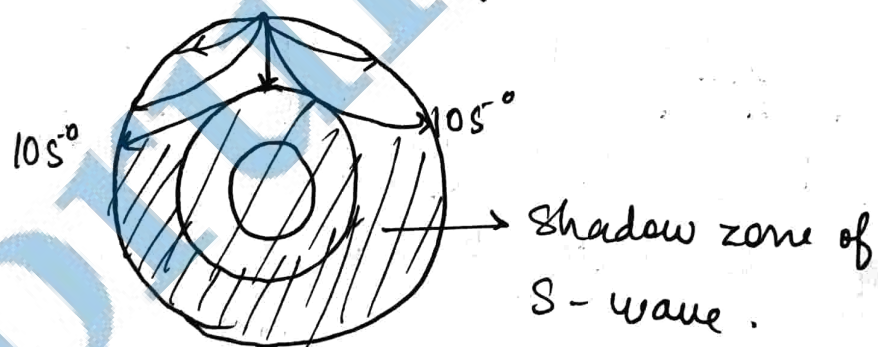
↳ ① passes through 1st layer and speed increases  $\Rightarrow$  so solid.

↳ ② similar with other solid layers like mantle & inner core.

↳ ③ speed decreases when passes through liquid layer (outer core)



- When S wave is passes
  - ↳ It passes through solid layers with increased speed.
  - ↳ But does not pass through liquid layer → This is how we know that outer core is liquid.



Through studying of these seismic waves behaviour & shadow zones, one gets to know more about the properties of Earth's interior.

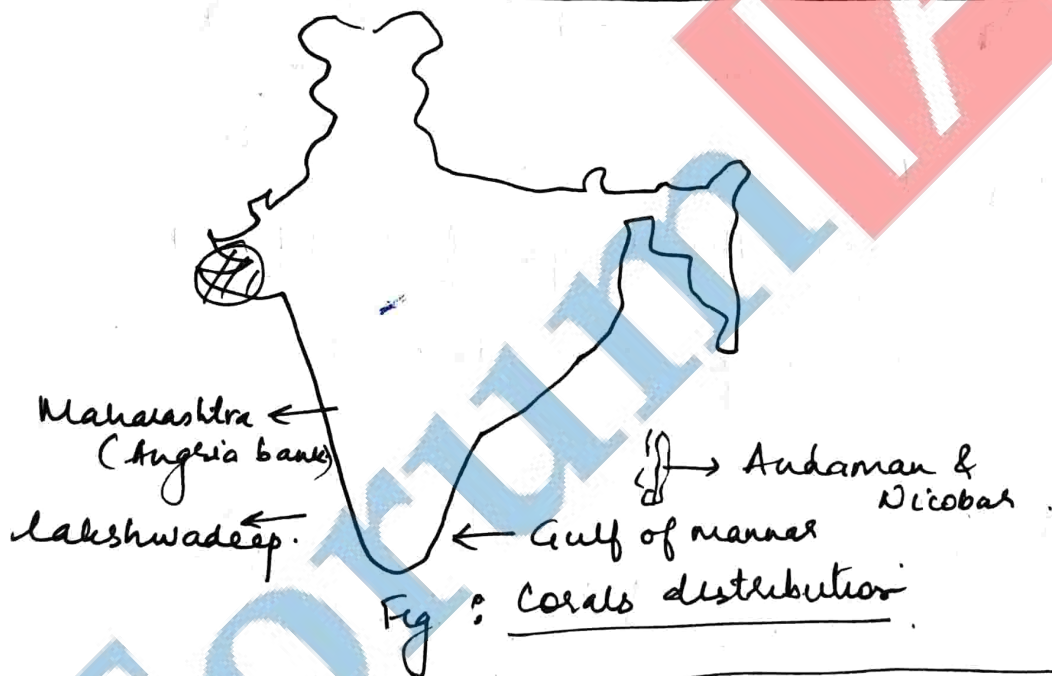


Q.17) Highlight the conditions suitable for formation and development of coral reefs. Also, discuss various natural and anthropogenic factors responsible for their destruction. (15 marks, 250 words)

प्रवाल भित्तियों के निर्माण और विकास के लिए उपयुक्त परिस्थितियों पर प्रकाश डालिए। इसके अलावा, उनके विनाश के लिए जिम्मेदार विभिन्न प्राकृतिक और मानवजनित कारकों पर चर्चा कीजिए।

(अंक 15, शब्द 250)

Coral reefs are known as tropical rainforest of the ocean. Corals are in symbiotic relation with the zooxanthellae.



Conditions suitable for formation & development of corals:

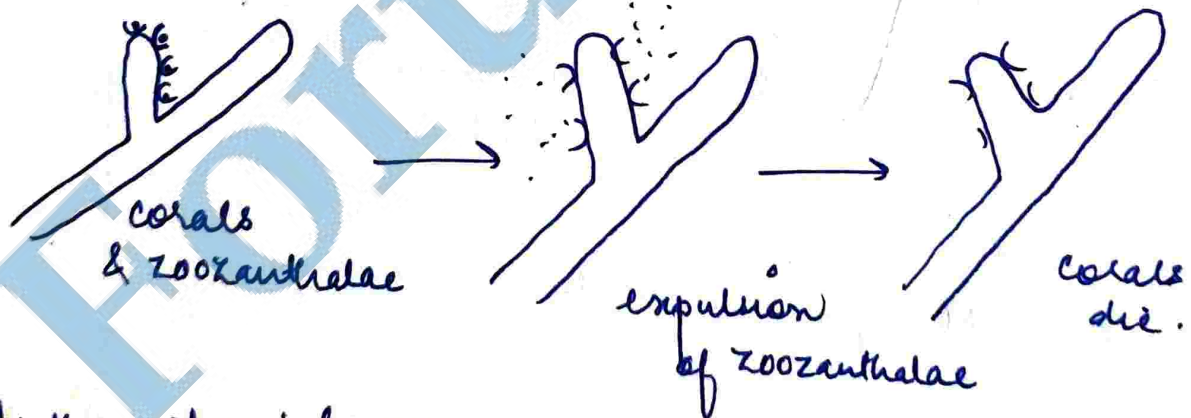
- ① Shallow water.
- ② Warm water → so mostly found in tropical regions eg: Great barrier reef.

- ③ there are also deep sea temperate corals
- ④ less temperature variation in either direction
- ⑤ presence of  $\text{CaCO}_3$  in water abundantly.



Fig: Different types of corals formed.

### Factors responsible for their destruction



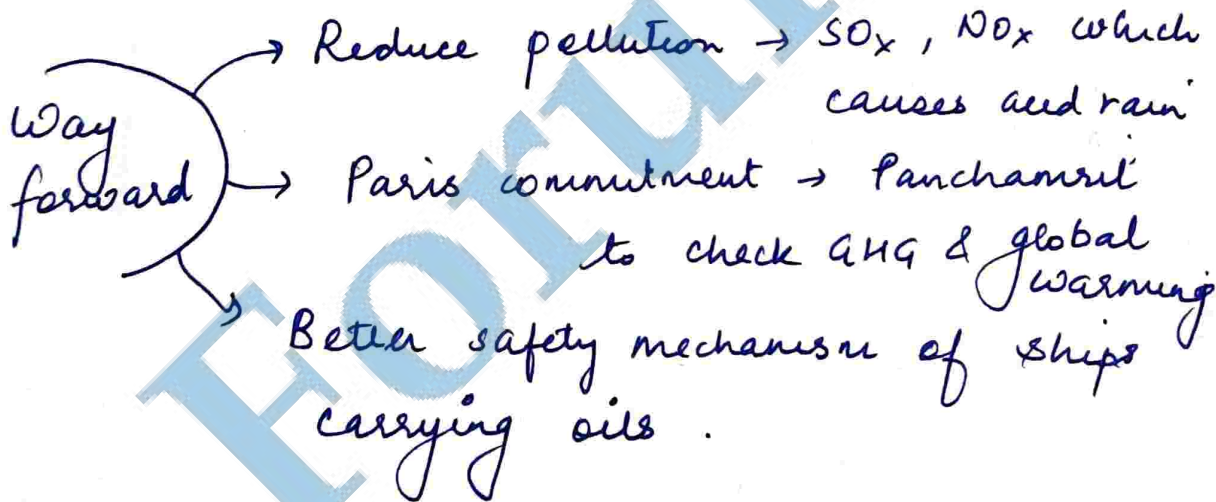
### Anthropological reasons:

- ↳ 1. climate change & global warming → so rise in temperature (due to humans).
- ↳ 2. Rising sea level due to melting of polar icecaps.

- ↳ 3. pollution : oil spills from ships .
- ↳ 4. Ocean acidification through eutrophication  
- leads to loss of  $\text{CaCO}_3$  ( changes in saturation zones).
- ↳ 5. Dumping of industrial waste, plastic etc

### Natural reasons

- ↳ Acid rain
- ↳ Global rise in temperature .
- ↳ rising changes in ocean flora & fauna
- ↳ invasive species .



Corals are beautiful gift of nature and maintain ocean diversity . Thus must be protected and tech like bio-rock technology can be used to restore them .

### **Feedback**

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Interpretation

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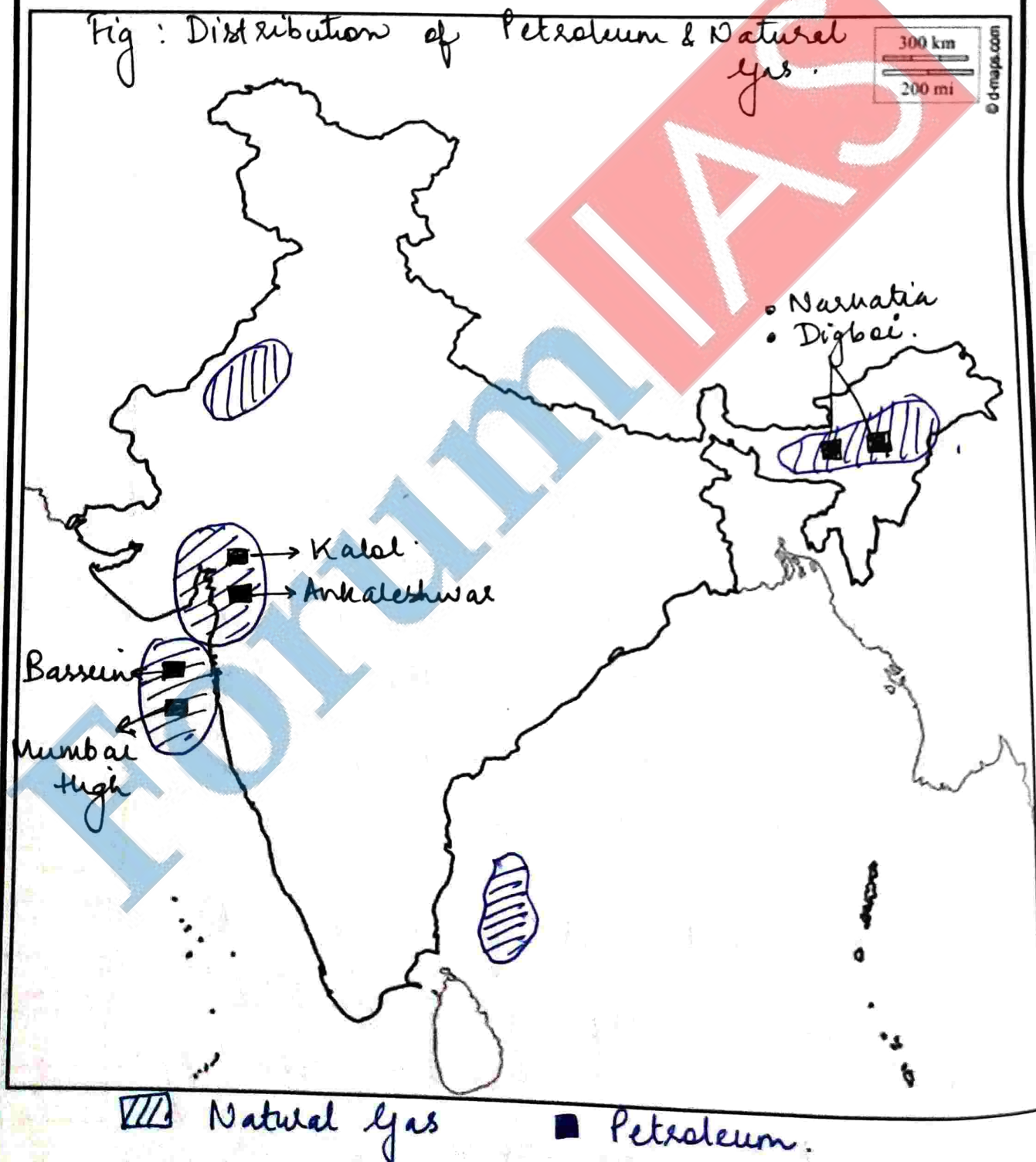
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**Q.18)** With the help of map given below, highlight the distribution of petroleum and natural gas (P&NG) in India. Also, discuss the implications of scarcity of P&NG resources in the country.

(15 marks, 250 words)

नीचे दिए गए मानचित्र की सहायता से भारत में पेट्रोलियम और प्राकृतिक गैस (P&NG) के वितरण पर प्रकाश डालिए। इसके अलावा, देश में P&NG संसाधनों की दुर्लभता के निहितार्थों पर चर्चा करें।

(15 अंक, 250 शब्द)



## Implication of scarcity of P & Na resources in the country:

- Economic → 86% of oil needs of India is imported  
↳ leads to huge import bill.  
↳ can hamper other developmental needs.
- Geopolitical  
↳ dependence on nations rich in oil resources.  
↳ Disturbance in such regions can cause disturbance in supply  
eg: In case of India west Asia & recent Russia-Ukraine war & Europe's dependence of Russia for energy.
- Geographical implication  
↳ oil refineries location will be such that can import crude petroleum from outside.

↳ location of industries will be impacted

#### 4. Environment

↳ Such fuels release  $\text{CO}_2$ , which is a GHG and hampers our climate commitment.

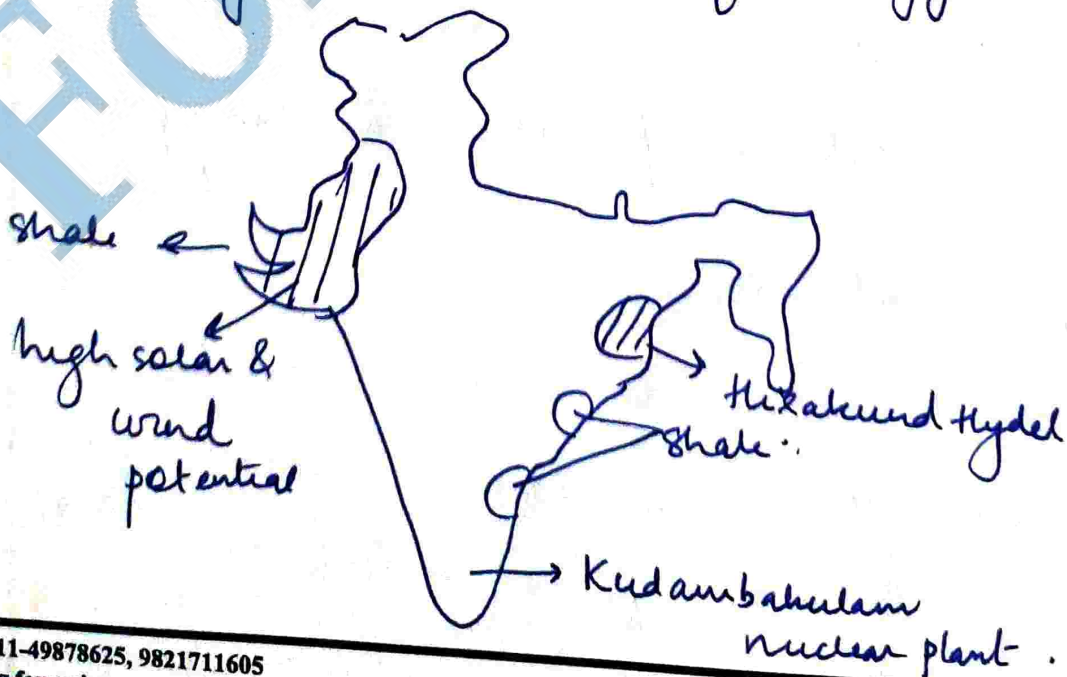
#### 5. Energy security

↳ At any time supply can be cut.

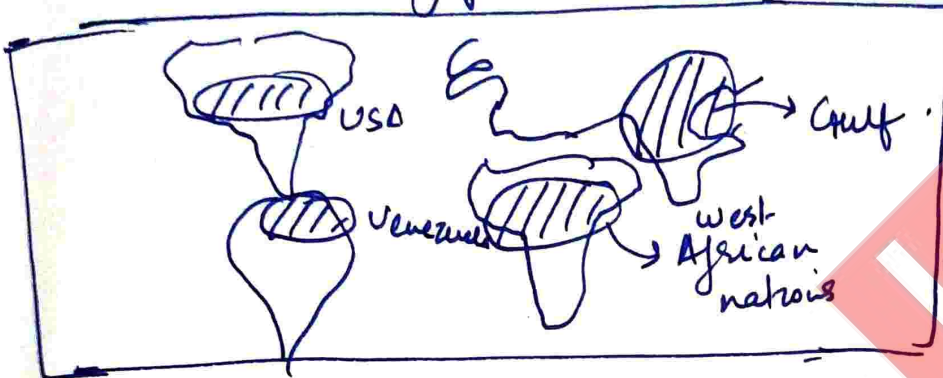
↳ can be used as a weapon of war.

What can be done?

↳ ① Diversify our sources of energy.



- ② Maintain our strategic reserves.
- ③ Diversify the countries from which we source energy



- ④ Technological lead in newer form of energy like Hydrogen energy, EV vehicles  
eg: National Hydrogen Mission

Nitin Gadkari, the Union Transport minister coming to Parliament in H<sub>2</sub>-fuelled vehicle is a signal to the nation for our commitment to energy diversity and leading in new forms of energy.

**Feedback**  
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Structure/ Presentation
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Value Addition
Total



Q.19) Enumerate the factors that helped 'Bombay' emerge as center of cotton-textile industry. Also, present reasons for the dispersion of cotton textile industries to other parts of the country.  
(15 marks, 250 words)

उन कारकों का उल्लेख कीजिए जिन्होंने 'मुंबई' को सूती-वस्त्र उद्योग के केंद्र के रूप में उभरने में मदद की। साथ ही देश के अन्य भागों में सूती वस्त्र उद्योगों के विस्तार के कारणों को भी प्रस्तुत करें।  
(15 अंक, 250 शब्द)

The first cotton textile mill was established in later half of 19th century in the Bombay region.

Reasons for Bombay to emerge as centre of cotton textile

- ① Raw material : cotton growing region → presence of black soil which is good for cotton.
- ② Market : Mumbai → an urban centre was a good market for textiles. Also humid climate → cotton comfortable to wear.
- ③ Transport : well connected road & rail network.

1st railway Mumbai to Thane 1853  
⇒ Also Mumbai port for exports

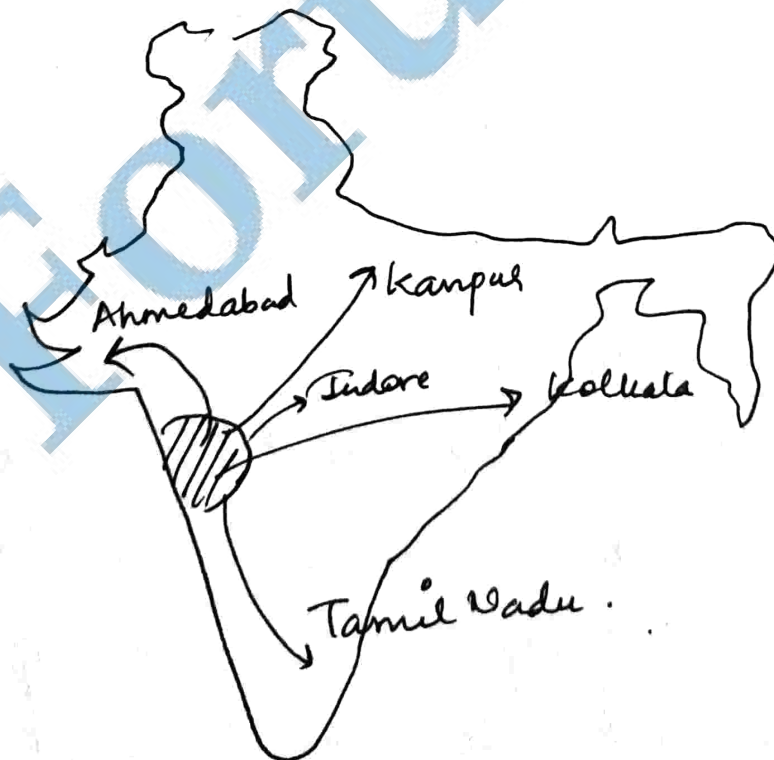


④ labour: Mumbai had skilled labour and there was migration of unskilled labour from different parts.

⑤ Government policies: promoting textile manufacturing.

⑥ Geography → Black soil  
 ↳ Humid climate → so less breakage of cotton threads while weaving

Dispersion of cotton textile industries to other parts:



Reason for dispersion:

1. Rising cost of labour in Mumbai → due to high cost of living.
2. Cheap cotton + Kandla port } in Gujrat attracted cotton textile mills here. can import cotton + export product.
3. Places like Kanpur → already had other textile industry like silk, jute, wool ⇒ so acted as a COA AGGLOMERATION for cotton textile.
4. Industrial policies of Tamil Nadu - i.e focus on labour <sup>intensive</sup> industry → places like Coimbatore developed as industrial textile centres.

Cotton textile industry is labour intensive and has helped countries like Bangladesh & Vietnam to develop. India must also tap its labour availability in the sector by making Textile park, focus on technical textile etc.

Q.20) Stubble burning is a seasonal issue that accentuates air pollution problem in Delhi-NCR, however, National Air Quality Index reported just zero, two and five 'good' air quality day in 2018, 2019 and 2020 respectively for Delhi. In this context, discuss various underlying geographical and human factors responsible for this chronic problem and suggest some remedial measures. (15 marks, 250 words)

पराली जलाना एक मौसमी मुद्दा है जो दिल्ली-एनसीआर में वायु प्रदूषण की समस्या को बढ़ाता है, हालांकि, राष्ट्रीय वायु गुणवत्ता सूचकांक ने दिल्ली के लिए 2018, 2019 और 2020 में क्रमशः शून्य, दो और पांच 'अच्छा श्रेणी वायु गुणवत्ता दिवस की सूचना दी। इस संदर्भ में, इस पुरानी समस्या के लिए जिम्मेदार विभिन्न अंतर्निहित भौगोलिक और मानवीय कारकों पर चर्चा करें और कुछ उपचारात्मक उपायों का सुझाव दें। (15 अंक, 250 शब्द)

Air pollution in NCR now seems to be a perennial problem, with situation becoming worse in winter months.

Stubble burning in states like Punjab, Haryana and Rajasthan & U.P are only one of the reasons of pollution. Also this is a seasonal event.

Geographical Reasons for the pollution:

1. Lower rainfall in Delhi → both from Bay of Bengal Branch & Arabian → so less chance for dust & PM<sub>10</sub> & PM<sub>2.5</sub> to settle.

2. Desert areas near to it which brings dust storm in the area.



3. Lack of much green cover in the area.

4. Continentality.

Human factor for the pollution :

1. Pollution from Transportation - heavy traffic  $\rightarrow$  release of  $SO_x$ ,  $NO_x$ ,  $O_3$  etc.
2. Industrial pollution  $\rightarrow$   $NO_x$ ,  $SO_x$ ,  $CO$  etc
3. Incomplete combustion of fuels in engines  $\rightarrow$  lack of catalytic converters.
4. Burning of crackers indiscriminately on festivals.

Remedial Measures:

1. Stubble burning → use of combined harvester, PUSA - biodecomposer, schemes to exchange stubble for something (like Plastic for rice in Andhra).
2. Transportation → greater reliance of mass Transits like metros, CNG autos, BS-VI compliant vehicles, promote EV vehicles, odd-even.
3. Industries → social cost must be charged.
  - ↳ Tax the polluting industries
  - ↳ incentives adoption of new tech.
4. coal power plant :- install catalytic converters, desulphurisation technology & electrostatic precipitators.

Article 21 guarantees right to clean environment and also keeping environment clean is a DPSP & fundamental duty. So all must come together to fight pollution.

**Feedback**

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Structure/ Presentation
Question Interpretation
Content
Value Addition
Total