

TEST CODE 8 1 3 5 2 4

MGP 2025

Time Allowed : Three Hours  
समय : तीन घंटे

ForumIAS

Maximum Marks : 250  
अधिकतम अंक : 250

## GENERAL STUDIES / सामान्य अध्ययन

Name Of Candidate परीक्षार्थी का नाम	DEEPANSHU JINDAL		
Roll No./अनुक्रमांक	1910161403	Medium/माध्यम	English <input checked="" type="checkbox"/> हिंदी <input type="checkbox"/>
Center Code/परीक्षा केंद्र	1900	Date/दिनांक	14-08-2025

\*Center Code : For Online - 1900 / Delhi : Karol bagh - 1901, ORN - 1902, Mukharji Nagar - 1903 / Patna : Boring Rd. - 2001 / Hyderabad : Jawahar Nagar - 2101

INDEX TABLE / अनुक्रमणिका			INSTRUCTION / अनुदेश	
Q. No. प्र.सं.	Max. Marks अधिकतम अंक	Marks Obtained प्राप्तांक		
1			1. Please do furnish Name, Email, Roll No and Mobile in the answer sheet. कृपया उत्तर-पुस्तिका में नाम, ईमेल, रोल नंबर और मोबाइल नंबर भरें।	
2			2. There are TWENTY questions printed in ENGLISH & HINDI, all questions are compulsory. उत्तर पुस्तिका में अंग्रेजी/हिंदी में बीस प्रश्न दिए गए हैं, सभी प्रश्न अनिवार्य हैं।	
3			3. The number of marks carried by a question/part is indicated against it. प्रत्येक प्रश्न/भाग के लिए निर्धारित अंक उसके सामने अंकित किए गए हैं।	
4			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. उत्तर प्रवेश पत्र में अधिकृत माध्यम में लिखे जाने चाहिए, जो कि दिए गए स्थान में इस प्रश्न-सह-उत्तर (क्यूसीए) पुस्तिका के कवर पर स्पष्ट रूप से लिखा जाना चाहिए।	
5			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. प्रश्नों में शब्द सीमा, यदि निर्दिष्ट हो, का पालन किया जाए। प्रश्न-सह-उत्तर पुस्तिका में खाली छोड़े गये किसी भी पृष्ठ या पृष्ठ के भाग को स्पष्ट रूप से काट दें।	
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Total/कुल अंक	250		For Student Only / केवल परीक्षार्थी प्रयोग हेतु	
Examiner's Discretion/मूल्यांकन कर्ता का विवेक :			Start Time/प्रारंभ करने का समय : 9:00 AM	End Time/समाप्त करने का समय : 12 Noon
Total Marks/कुल अंक :			Mode Of Examination/ परीक्षा की विधि :	Online/ऑनलाइन <input checked="" type="checkbox"/> Offline/ऑफलाइन <input type="checkbox"/>
*Examiner's Discretion is the marks awarded at the discretion of the examiner 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. मूल्यांकन कर्ता का विवेक अंक, आपकी लिखावट, प्रस्तुति, आरेखों के उपयोग, फ्लोचार्ट, तथ्यों और आंकड़ों या समग्र रूप किसी अन्य विषय वस्तु, जो मूल्यांकन कर्ता को आपकी कॉपी में पसंद आती के आधार पर (लेकिन इन्हीं तक सीमित नहीं) पर दिए गए अंक हैं।			For Office Use Only / केवल कार्यालय प्रयोग हेतु	
			ECN CODE/ ईसीएन कोड :	Evaluation Date/ मूल्यांकन तिथि :
			① ② ③ ④ ⑤	

**Note:** Students are expected to incorporate suggestions from the feedback provided in the answers. Discussion classes for the tests are also available online in your portal to aid in your preparation. Further, students are requested to see the good copies of the tests and learn from them. You can also discuss your copy with a Mentor and discover ways and means to improve your answers, or if you have any issues with this test / copy. Ask specific questions, to get specific answers.

## EXAMINER'S REMARKS

### CRITERIA FOR THE FEEDBACK SECTION AT THE END OF EACH QUESTION

1. **AWIS = Answered What is Asked.** This means whether you have addressed the core demand of the question or not. Addressing the core demand of the question gets you an objectively fair score. It is examiner's perception if you have understood the question and if you know the answer in the first place. Creative answer writing, sometimes missing the core demand, may fetch very high or very low scores, and exposes your answer to the subjectivity of the examiner.
2. **CD & VA = Content Density & Value Addition.** Examiner will evaluate the quality and quantity of your content in the answer. In the same word limit and space limit have you (a) written what is asked (b) gone beyond what is asked (c) enriched answers through combination of ( but not all!) suggestions, ideas, quotes, flowcharts, diagrams, facts and figures, data etc. This affects objective components of assessment.
3. **S & F = Structure & Flow =** Whether you have structured your answer properly or not. Whether the answer has been broken into parts and sub-parts and each part has been addressed appropriately or not. Whether the flow of the answer is maintained. Affects both subjective and objective components of assessment.
4. **P & R =** How your answer performs on the criteria of **presentation, ease of read, clarity and apparent effort** in writing the answer. This affects the subjective components of assessment.

FLST-6

ForumIAS

MGP 2025 | General Studies | Test Code : 813524

(20 Questions | 250 Marks | Duration 3 Hours)

**Instructions:** All questions are compulsory. The number of marks carried by a question/part is indicated against it. Quality of the answer is more important than the length of the answer.

निर्देश : सभी प्रश्न अनिवार्य हैं। प्रत्येक प्रश्न द्वारा धारित अंकों को उसके सामने इंगित किया गया है। उत्तर की गुणवत्ता उत्तर की लंबाई की तुलना में अधिक महत्वपूर्ण है।

Q.1) How can quantum technologies optimize production processes and improve efficiency in the manufacturing sector? (10 Marks, 150 Words)

कॉन्टम प्रौद्योगिकियां उत्पादन से प्रक्रियाओं को कैसे अनुकूलित और विनिर्माण क्षेत्र में दक्षता में सुधार कर सकती हैं?

Q.2) What is NISAR mission? How will it help in climate change monitoring and natural hazard management? (10 Marks, 150 Words)

NISAR मिशन क्या है? यह जलवायु परिवर्तन निगरानी और प्राकृतिक आपदा प्रबंधन में कैसे मदद करेगा?

Q.3) Integration of the Internet of Things (IoT) into our lives can change our world for the better, but it comes with its own set of risks and challenges. Elaborate. (10 Marks, 150 Words)

इंटरनेट ऑफ थिंग्स (IoT) को हमारे जीवन में शामिल करने से हमारी दुनिया बेहतर हो सकती है, लेकिन इसके साथ जोखिम और चुनौतियाँ भी जुड़ी हैं। विस्तार से बताइए।

Q.4) Explain the 'Raman Effect' discovered by Sir C.V. Raman and show how it revolutionized the field of molecular physics. (10 Marks, 150 Words)

सर सी.वी. रमन द्वारा खोजे गए 'रमन प्रभाव' की व्याख्या कीजिए तथा बताएं कि इसने आणविक भौतिकी के क्षेत्र में किस प्रकार क्रांति ला दी।

Q.5) Biofuels can play a role in energy security by reducing India's reliance on imported fossil fuels and diversifying its energy mix. Examine. (10 Marks, 150 Words)

जैव ईंधन भारत की आयातित जीवाश्म ईंधन पर निर्भरता को कम करके और इसके ऊर्जा मिश्रण में विविधता लाकर ऊर्जा सुरक्षा में भूमिका निभा सकते हैं। परीक्षण करें।

Q.6) Define Environmental Impact Assessment (EIA) and bring out its significance in promoting sustainable development in the country. (10 Marks, 150 Words)

पर्यावरण प्रभाव आकलन (EIA) को परिभाषित करें तथा देश में धारणीय विकास को बढ़ावा देने में इसके महत्व पर प्रकाश डालें।

Q.7) "Integrating technology at various stages of disaster management can enhance the effectiveness of disaster response strategies." Elucidate. (10 Marks, 150 Words)

"आपदा प्रबंधन के विभिन्न चरणों में प्रौद्योगिकी को एकीकृत करने से आपदा प्रतिक्रिया रणनीतियों की प्रभावशीलता बढ़ सकती है।" स्पष्ट करें।

Q.8) The recent spike in terror-related incidents in Jammu and Kashmir has raised serious concerns within the country's security establishment. Highlighting the reasons for this spike, suggest steps to counter it. (10 Marks, 150 Words)

*Bihar, Kashmir State, MWA, 30 PK*  
जम्मू-कश्मीर में हाल ही में हुई आतंकी घटनाओं में वृद्धि ने देश की सुरक्षा संस्थाओं के सामने गंभीर मुद्दे उत्पन्न किए हैं। इस वृद्धि के कारणों पर प्रकाश डालते हुए, इससे निपटने के लिए उपाय सुझाएँ। (10 अंक, 150 शब्द)

Q.9) Examine the role of the National Investigation Agency (NIA) in countering various internal security threats faced by the country. (10 Marks, 150 Words)

देश के सामने आने वाले विभिन्न आंतरिक सुरक्षा खतरों का सामना करने में राष्ट्रीय जांच एजेंसी (NIA) की भूमिका का परीक्षण करें। (10 अंक, 150 शब्द)

Q.10) While the operational advantages of Integrated Theatre Commands (ITCs) are well-acknowledged, the path to implementation is fraught with challenges. Discuss in context of India. (10 Marks, 150 Words)

*BAR*  
इंटीग्रेटेड थिएटर कमांड (ITC) के परिचालन लाभ सर्वविदित हैं, लेकिन कार्यान्वयन का मार्ग चुनौतियों से भरा है। भारत के संदर्भ में चर्चा करें। (10 अंक, 150 शब्द)

Q.11) Biotechnology, by integrating biological sciences with technological innovations, offers comprehensive solutions to some of the most pressing challenges in food production, waste management and human health. Elucidate. (15 Marks, 250 Words)

जैव प्रौद्योगिकी, जैविक विज्ञान को तकनीकी नवाचारों के साथ एकीकृत करके, खाद्य उत्पादन, अपशिष्ट प्रबंधन और मानव स्वास्थ्य में कुछ सबसे महत्वपूर्ण चुनौतियों के लिए व्यापक समाधान प्रदान करती है। स्पष्ट कीजिए। (15 अंक, 250 शब्द)

Q.12) Describe how the Gaganyaan mission can help achieve India's broader national objectives. Also, throw light on the key challenges that the mission faces. (15 Marks, 250 Words)

*cast, time, NASA*  
बताइए कि गगनयान मिशन भारत के व्यापक राष्ट्रीय उद्देश्यों को प्राप्त करने में किस प्रकार सहायक हो सकता है। साथ ही, मिशन के समक्ष आने वाली प्रमुख चुनौतियों पर भी प्रकाश डालिए। (15 अंक, 250 शब्द)

Q.13) The recent stampedes in the country highlight the multiple factors responsible for such tragedies. Elaborate. Also, outline the key aspects of NDMA's guidelines on Crowd Management to prevent such incidents. (15 Marks, 250 Words)

देश में हाल ही में हुई भगदड़ की घटनाओं ने ऐसी त्रासदियों के लिए जिम्मेदार कई कारकों को उजागर किया है। सविस्तार वर्णन कीजिए। साथ ही, ऐसी घटनाओं को रोकने के लिए "भीड़ प्रबंधन" पर NDMA के दिशा-निर्देशों के प्रमुख पहलुओं को रेखांकित कीजिए। (15 अंक, 250 शब्द)

Q.14) "Mangroves contribute significantly to the coastal economy and ecology but they are threatened by numerous factors". Elaborate. Also, state the measures taken by the government for mangrove conservation and restoration. (15 Marks, 250 Words)

*MAC, MISHTI, ERZ*  
"मैंग्रोव तटीय अर्थव्यवस्था और पारिस्थितिकी में महत्वपूर्ण योगदान देते हैं, लेकिन वे कई कारकों से खतरे में हैं"। सविस्तार वर्णन कीजिए। साथ ही, मैंग्रोव संरक्षण और बहाली के लिए सरकार द्वारा उठाए गए उपायों के बारे में भी बताएँ। (15 अंक, 250 शब्द)

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(20 Questions | 250 Marks | Duration 3 Hours)

Q.15) Despite notable improvements in India's disaster management framework since 2005, challenges persist in ensuring timely response and effective coordination during crises. Analyse. (15 Marks, 250 Words)

वर्ष 2005 से भारत के आपदा प्रबंधन ढांचे में उल्लेखनीय सुधार के बावजूद, संकट के दौरान समय पर प्रतिक्रिया और प्रभावी समन्वय सुनिश्चित करने में चुनौतियाँ बनी हुई हैं। विश्लेषण करें। (15 अंक, 250 शब्द)

Q.16) Alongside the alarming depletion, rising pollution levels of groundwater resources are exacerbating the water crisis in India. In light of the statement, discuss the reasons for groundwater pollution in the country. Suggest remedial measures and mention the initiatives taken by the government in this regard. (15 Marks, 250 Words)

भूजल संसाधनों में खतरनाक कमी के साथ-साथ प्रदूषण का बढ़ता स्तर भारत में जल संकट को और बढ़ा रहा है। इस कथन के आलोक में, देश में भूजल प्रदूषण के कारणों पर चर्चा करें। इस संबंध में सुधारात्मक उपाय सुझाएँ और सरकार द्वारा की गई पहलों का उल्लेख करें। (15 अंक, 250 शब्द)

Q.17) Describe how the linkage between terrorism and organized crime poses challenges to internal security. What measures would you suggest to tackle this nexus and the threats emerging from it? (15 Marks, 250 Words)

आतंकवाद और संगठित अपराध के बीच संबंध किस तरह आंतरिक सुरक्षा के लिए चुनौतियाँ पैदा करते हैं, इसका वर्णन करें। इस गठजोड़ और इससे उत्पन्न होने वाले खतरों से निपटने के लिए आप क्या उपाय सुझाएँगे? (15 अंक, 250 शब्द)

Q.18) A range of interventions has led to improvement in the security situation in the North-East region of India, but several impediments to lasting peace still remain. Analyse. (15 Marks, 250 Words)

विभिन्न हस्तक्षेपों के कारण भारत के उत्तर-पूर्वी क्षेत्र में सुरक्षा स्थिति में सुधार हुआ है, लेकिन स्थायी शांति के लिए अभी भी कई बाधाएँ बनी हुई हैं। विश्लेषण करें। (15 अंक, 250 शब्द)

Q.19) Examine the reasons for continuation of Left-Wing Extremism (LWE) in certain parts of the country. Also suggest multi-pronged strategy to tackle the menace of LWE. (15 Marks, 250 Words)

देश के कुछ भागों में वामपंथी उग्रवाद (LWE) के जारी रहने के कारणों की जांच करें। वामपंथी उग्रवाद के खतरे से निपटने के लिए बहुआयामी रणनीति का सुझाव दीजिए। (15 अंक, 250 शब्द)

Q.20) An effective border management strategy hinges on the dual pillars of fortified security infrastructure and the socio-economic development of border communities. Discuss, with initiatives taken by the government in this regard. (15 Marks, 250 Words)

एक प्रभावी सीमा प्रबंधन रणनीति सुदृढ़ सुरक्षा अवसंरचना और सीमावर्ती समुदायों के सामाजिक-आर्थिक विकास के दोहरे स्तंभों पर निर्भर करती है। इस संबंध में सरकार द्वारा की गई पहलों पर चर्चा करें। (15 अंक, 250 शब्द)

BAPD

• Kargil Review

Ans 1.

Govt of India recently announced

National Quantum Mission with

four pillars

- Quantum Materials
  - Quantum Computing
  - Quantum Communication
  - Quantum time Keeping
- } National Mission

Quantum technology to optimise production process

1. Use of Quantum enzymes
  - ↳ Better optimisation & take up
2. Quantum Dots & Quantum wires
  - ↳ used in identifying errors in materials / output
3. Use of Quantum Materials
  - ↳ Defense materials for shield.

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

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# UPSC

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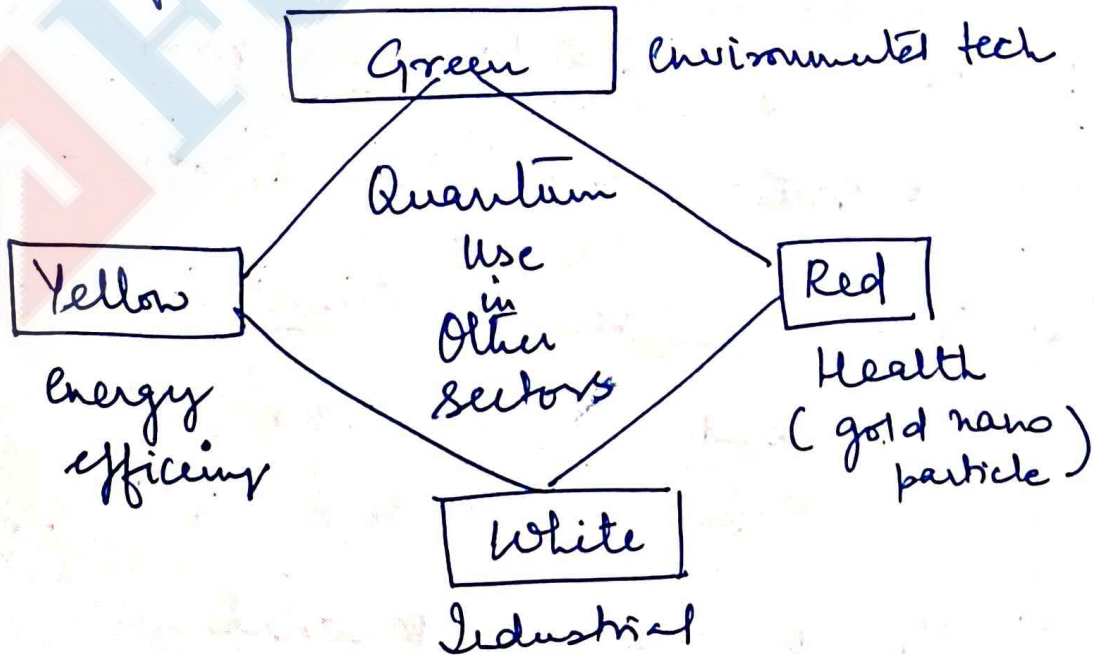
## Improving efficiency in Manufacturing

1. Better time keeping with  
: Quantum clocks

(eg) Recently due to glitch in atomic clocks - IT sector faced billions of loss

2. Quantum Cryptography : to maintain trade secrets and production information

3. Quantum Key Distribution : will give fillip to manufacturing sector



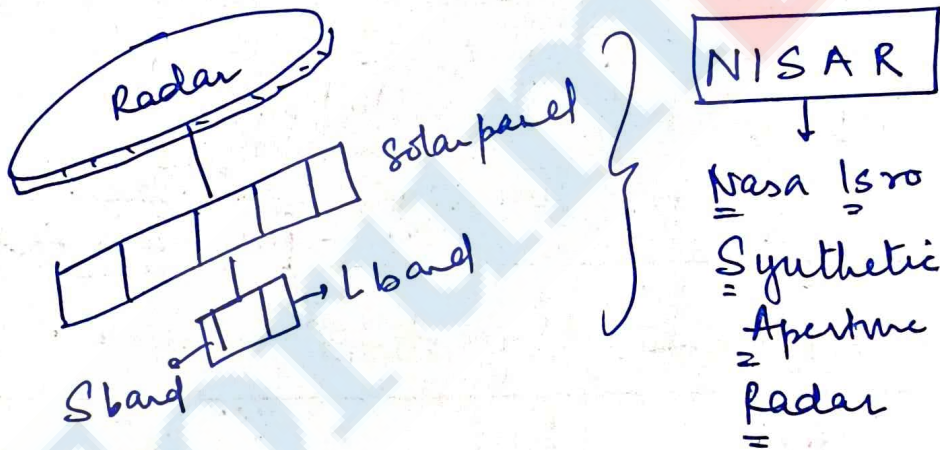
Quantum Technology can thus help in bringing Manufacturing to 25% of GDP

# UPSC

Candidates must not write on this margin

Ans 2.

India's ISRO and USA's NASA jointly launched world's most expensive satellite ever made.



- Key → Dual band use (first ever)
- Mission → L-band = NASA, S = ISRO
- Facts → Most precise information equal to 20 km ground radar capacity
- No weather disruption due to Synthetic Aperture Radar.

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

# UPSC

Candidates must not write on this margin

## Help in climate Change Monitoring

- | ↓ ①                             | ↓ ②                               | ↓ ③   | ↓ ④  |
|---------------------------------|-----------------------------------|---|--|
| Multiple times mapping of earth | Allow for clear & High def photos | Monitor greenhouse effect, pollution levels | help in triangulation of Data with ground stations |

⊕ Monitoring deforestation, GHG emissions real time.  
No Rain Fade

## Natural Hazard Management

- | ↓ ①                                      | ↓ ②   | ↓ ③  | ↓ ④                   |
|--|---|--|-----------------------|
| NISAR can make <u>Hazard Zoning Maps</u> | vulnerability analysis<br>⊕ GLOF risk monitor | Planned development promote<br>⊕ Uttarakshi flash floods prevent | earth quake maps also |

NISAR is a platform for future

sophisticated joint Missions & Collaborati-  
on between NASA & ISRO like Gaganyaan

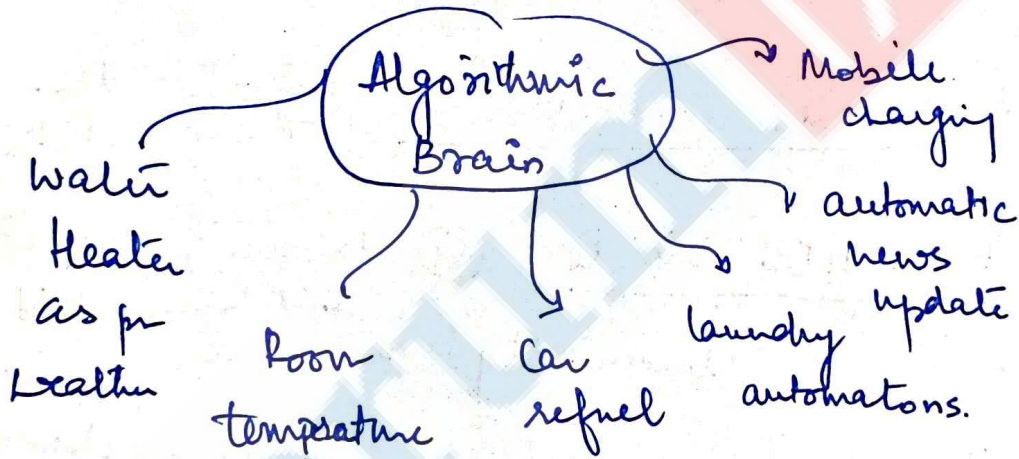
(Please do not write except the question number in this space)

# UPSC

Candidates must not write on this margin

Ans 3.

Internet of things means integration and inter connectedness of Hardware, software & network



Changing lives for better

- ① less repetitive tasks (e) cleaning dishes
- ② less Information burden (e) Raincoat for weather
- ③ Focus on core tasks (e) critical thinking and job
- ④ less burden on Women (e) 3/4th time in unpaid Care work

However some risks & challenges are there as:-

1. Data Privacy & Misuse (e.g. Alexa recording)
2. Monopoly of US based companies  
↳ data localisation issue
3. State Surveillance (e.g. Snowden Revelations)
4. Digital Divide (e.g. Urban vs Rural)  
↳ Inclusivity less 70% vs 35%
5. Job loss Challenge - vulnerable care workers
6. Autonomy & Control hampered  
↳ (e.g. dystopian world of sentient AI and IOT)

Therefore, need of hour is

Light touch Co-regulation Model

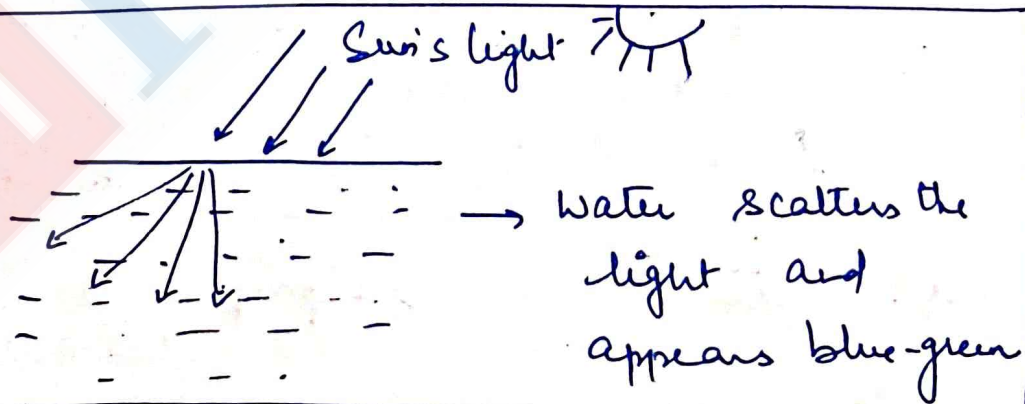
as suggested by Economic Survey

for Sandbox Regulation.

Ans 4.

February 28 is celebrated every year as homage to Sh. CV. Raman in form of National Science Day

Sir CV Raman's Contribution → Raman effect is the scattering of light when it travels from one medium to other  
Wm Nobel prize is 1930 for this discovery



How it revolutionised Molecular physics

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# UPSC

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1. Showed how light is made of particles (e) photons
2. Density differences cause scattering (e) Rainbow formation
3. Use in photo voltaics (e) solar energy
4. Level Jumping of electrons in an atom is explained by Raman effect
5. How Nano Gold appears Red
6. Usage in photometry, lenses etc.

Contribution of Sh CV Raman to field of science is helping the world

in spirit of Jai Kisan Jai Tarun  
Jai Vigyan  
Jai Anusandhan.

# UPSC

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Ans 5.

India recently achieved blending target of 20% ethanol (EB20) before 2026 year target.

Bio fuels → Derived from living organisms or their parts  
→ various types & generations

- Biodiesel
- Bio ethanol
- 1G
- 2G
- 3G
- 4G

(e.g.) GM Algae with Carbon Capture  
to make bio diesel

Role of Biofuels in reducing reliance on Imports

1. Can replace some crude oil imports

(e.g.) Saving of ₹ 1 lakh crore by EB20 program

2. Reduced demand for fossil fuel in captive industry (e.g.) Agri biofuel

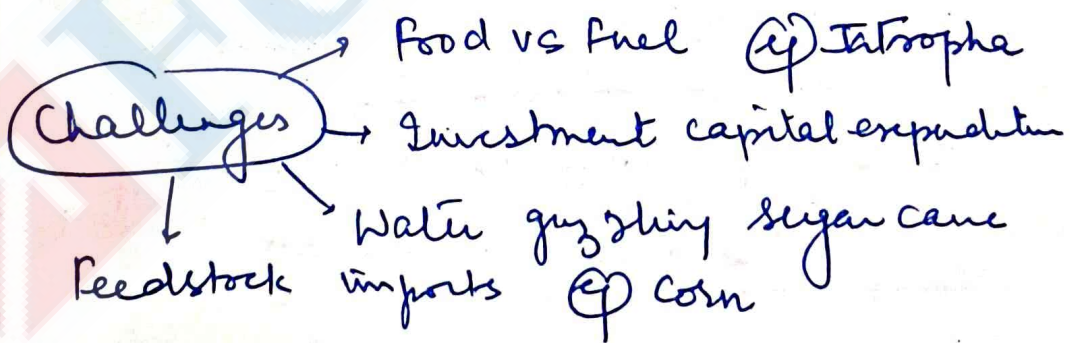
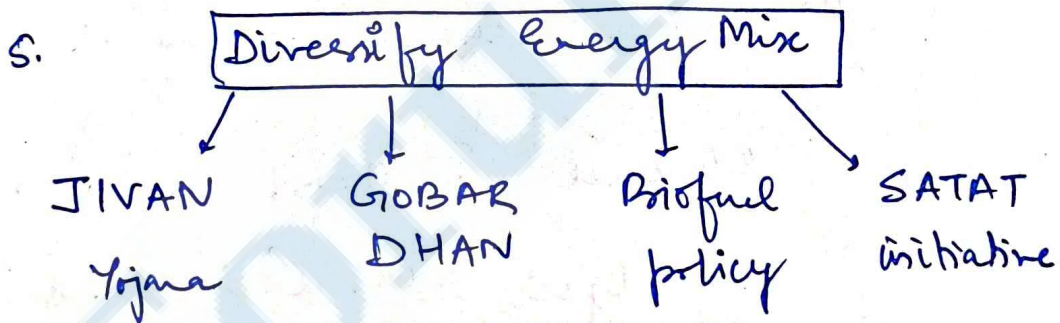
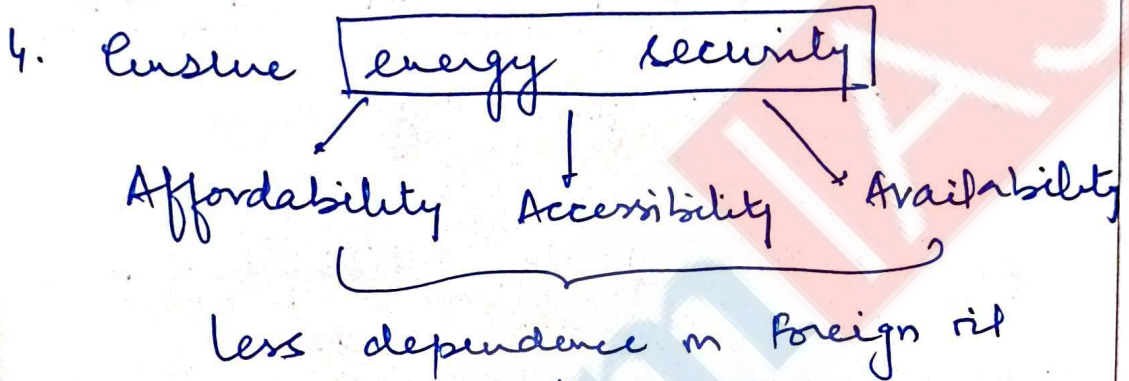
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# UPSC

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3. Flexifuel vehicles run on Biofuel

(e) Road sectors' 10% emission contribution can be reduced

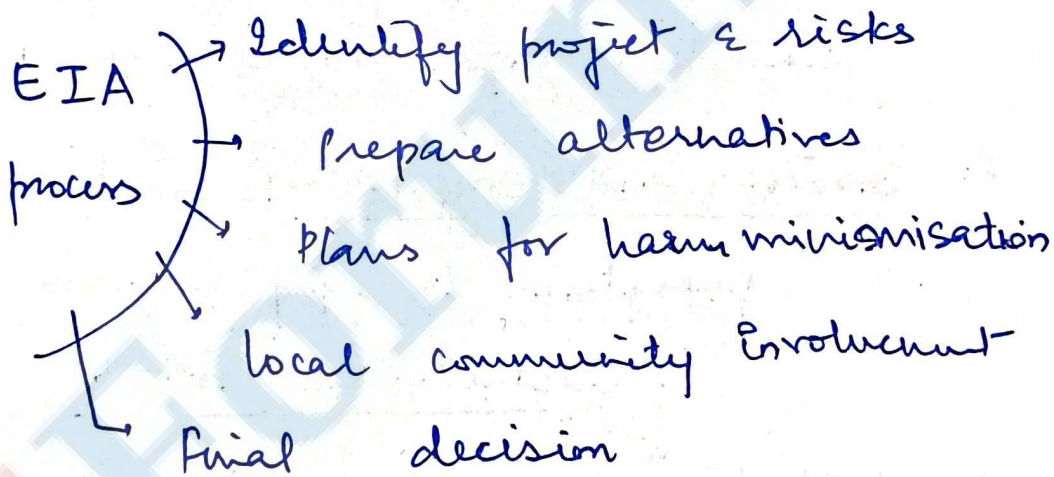


Need of the hour is greater investment in plants like at Panipat and repurposing used oil (RUCO)

Ans 6

## Environmental Impact Assessment (EIA)

means to identify and analyse the potential harm & benefits of a project on environment



## Significance for Sustainable Development

1. Brings environment centric consciousness  
(e) Kancha Gachibowli issue  
in Telangana
2. Helps in participative decision making → local empowerment

3. Based on precautionary principle  
↳ Risk avoidance

4. Anthropocentrism to Holism  
↳ Gaia Hypothesis

5. Promote corrective measures like  
alternative explored or reduced  
harmful impact on environment

6. Green GDP concept : for future  
generations to enjoy environment  
↳ Sustainable Growth

7. Polluter Pays principle  
↳ Remedial steps to be taken

Empowerment of Gram Sabhas and

NGT can help ensure

Article 21 : Right to clean environment  
as part of Right to life.

Ans 7.

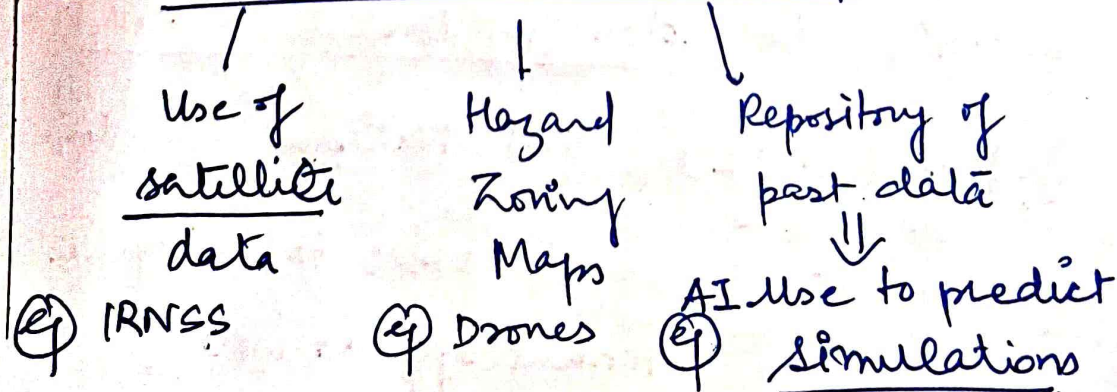
India recently launched Bharat Forecasting system to provide panchayat level data for weather monitoring → Early Warning System

Disaster Risk in India

- 8<sup>th</sup> most vulnerable country
- 60% earthquake prone
- 75% coast cyclone prone
- >80% deaths women+child

Integrating technology at various Disaster Management stages

## 1. Disaster Understanding



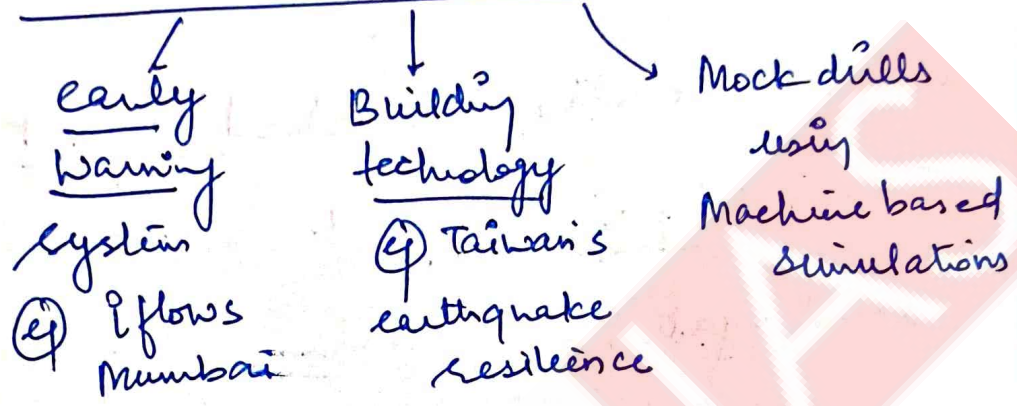
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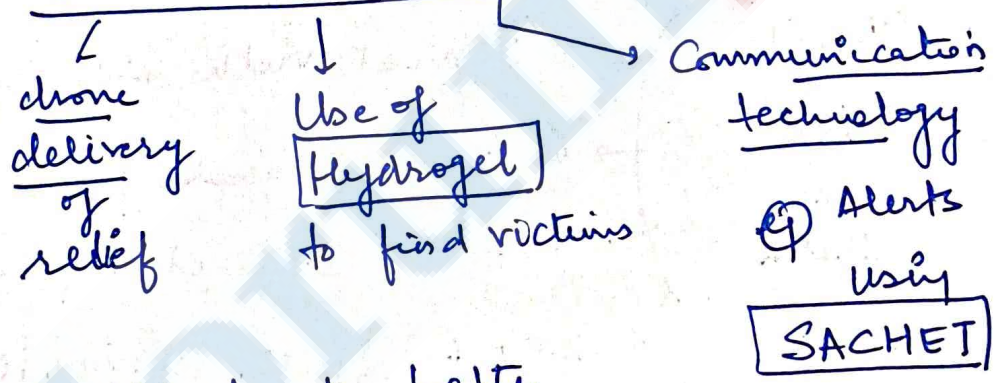
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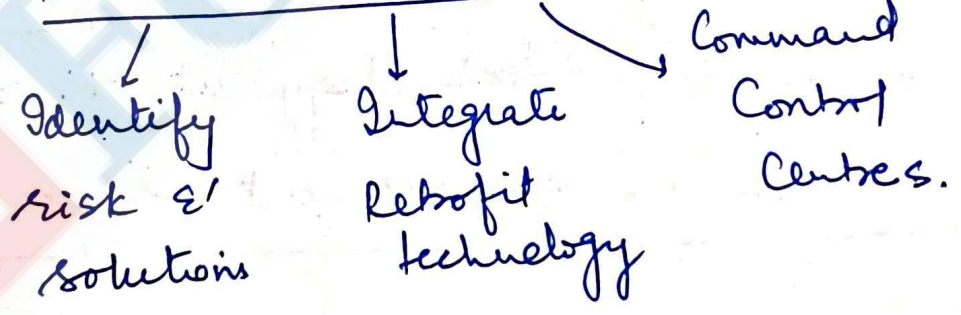
## 2. Disaster Risk Reduction



## 3. Disaster Response & Recovery :-



## 4. Build back better



India's Coalition for Disaster Resilient

Infra (CDRI) and National Disaster

Management Plan do well to integrate technology as well.

# UPSC

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Ans 8.

Recently Pahalgam terror attack Apr 25  
by Pakistani terrorists raised  
concerns not in India only but  
world over.

Reasons for spike in terror

1. thinning of Security Grid post  
Galwan 2020 → focus on Chinese
2. Recent abrogation of A. 370 led  
to development → terrorists did  
trophy attacks to erase gains.
3. Role of Pakistan → Internal turmoil  
economic recession → Deep State Control  
→ Focus on India: Revenge
4. Lapses in intelligence gathering

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# UPSC

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5. Overall reasons → Porous border

↓  
Rugged topography      Unfenced part

Steps to Counter it

1. Capacity building of forces

↓  
Manpower      Surveillance      AI equipment

2. Laser fencing of border as per  
Madhuka Gupta Committee

3. Local Development : to reduce sympathy for terror cause @ Vibrant Villages

4. Statehood for Jammu & Kashmir  
↳ to reduce local support

5. Local assets development by Police

6. Swift Response ⇒ Deterrence

Destroying terror infra across border  
@ Muridke during Op Sindoor is welcome step.

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# UPSC

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Ans 9.

Amendments to NIA Act were passed in 2019 to give more powers and autonomy to NIA.

National Investigative Agency → passed 2008 Act after Mumbai 26/11 attacks  
Specialised agency under Home Ministry to deal with terror cases.

Role of NIA in countering internal security threats

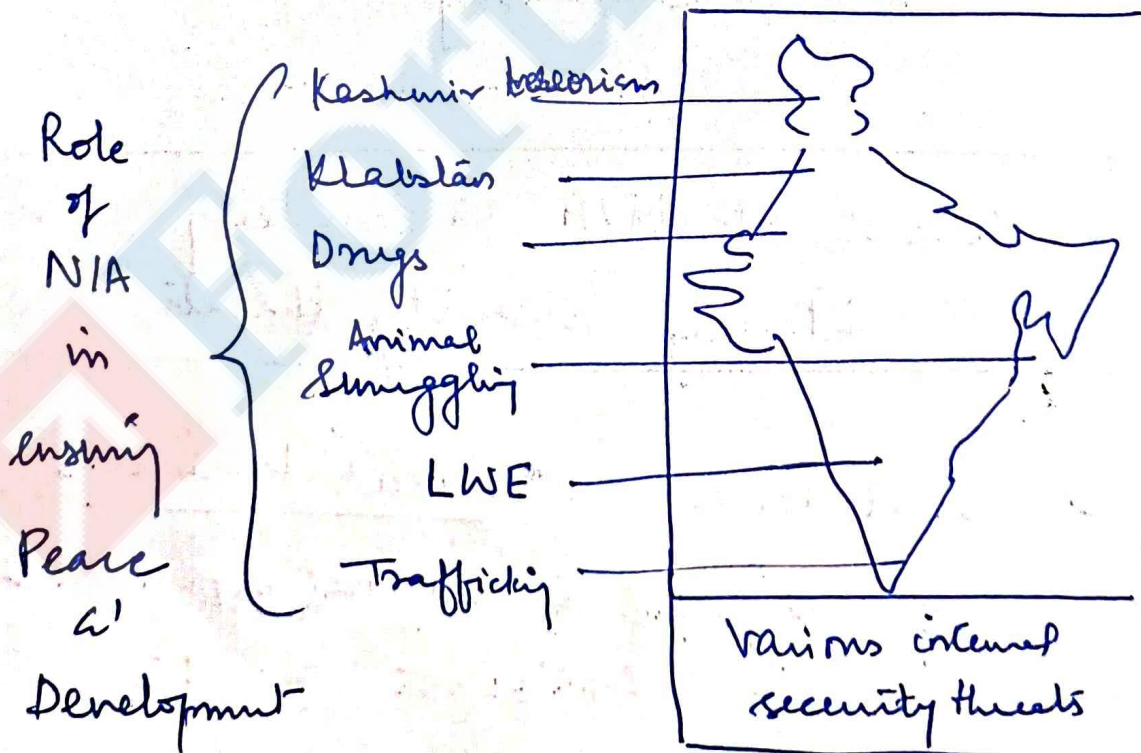
1. Crackdown on local terrorists  
(e) 30 people aided Pahalgam attack in April 2025. arrested
2. Specialisation & efficient in combating terror cases.

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# UPSC

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3. High conviction rate > 80% vs other agencies like ED < 3%
4. Tackle Separatist Movements  
(e) Khalistani supporters in Punjab
5. Power to attach assets given
6. Can prosecute Indian citizen even abroad after 2019 Amendment



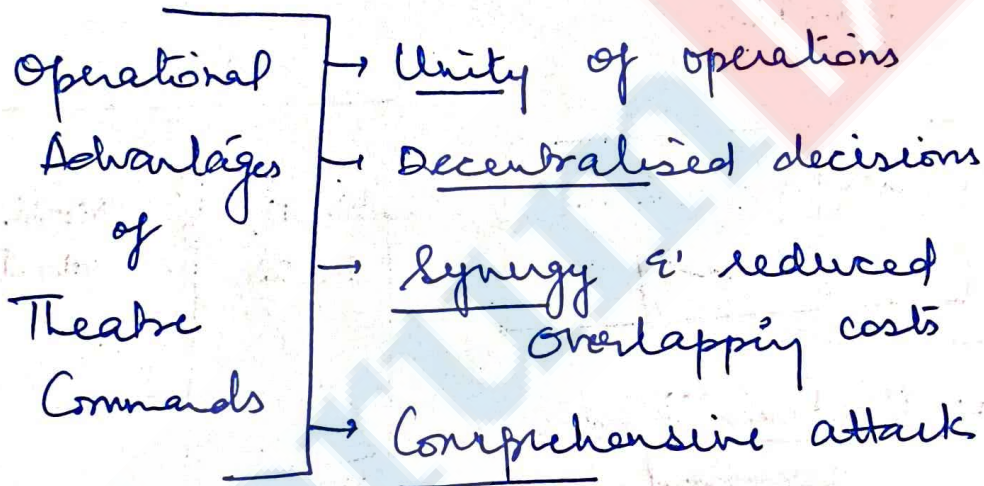
Due to specialised investigative powers

NIA has been instrumental in ensuring Surakshit Bharat

Ans 10.

Operation Sindoor by Indian forces

have shown benefit of jointness in operations of Army, Navy, Airforce



Challenges in path to implementation

1. Perceived land bias due to

Pakistan - China land border

2. Difficulty to integrate assets

⊕ Air chief recently expressed displeasure of division of air platforms.

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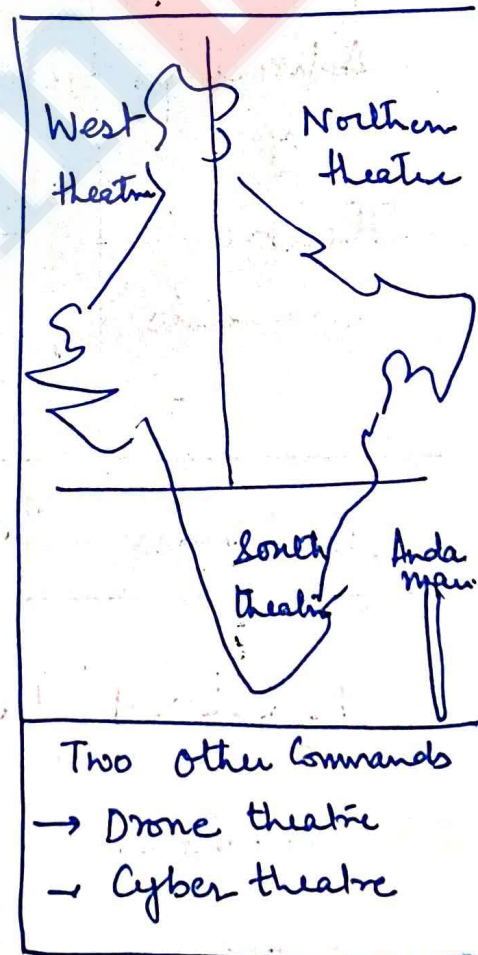
# UPSC

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3. Revamping trainings and recruitment
4. Behavioural resistance of centralised Army, Navy, Air Commands.
5. May take time to implement & reap benefits

Steps taken already

1. Nuclear theatre Command
2. Andaman theatre Command
3. Chief of Defence Staff
4. Joint Budget



CDS Shri Anil Chauhan recently

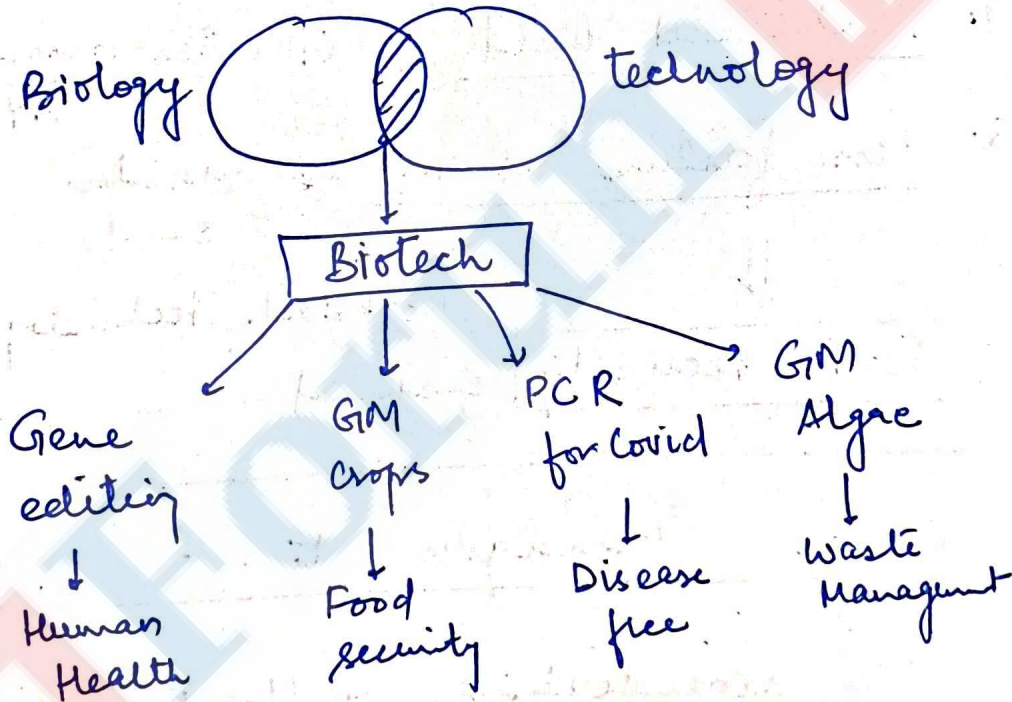
said theatrisation will make force Ready, Resilient and Responsive.

# UPSC

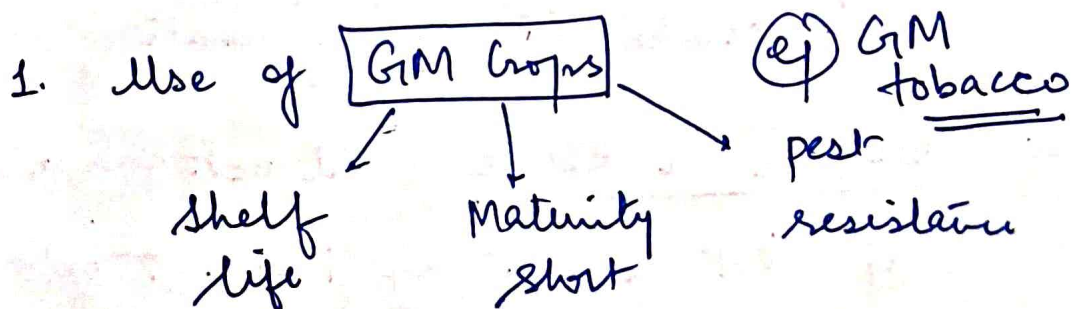
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Ans 11.

Biotechnology is the use of live organisms or their parts to create things of benefit to humans.



Comprehensive solution to food production challenge



# UPSC

2. Use of bio fertilisers  
(e) Neem coated urea, Nano Urea
3. Drought resilience: Climate change protection  
(e) rht wheat variety
4. Enhanced Yield (e) GM rice Basmati HYV
5. Less failure of crop → Breeder seeds  
↓  
Rootstock technology  
Food Security ensured

## Waste Management :-

1. Bio remediation (e) Use of GM algae, fungi to decompose
2. Phytoremediation e' Oil Zapper  
↳ curb oil spills waste
3. Recycle & Reuse: extract minerals  
(e) Pilot project by TERI to extract

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# UPSC

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gold from E waste

4. PUSA decomposer : Sludge waste  
Use of special bacteria
5. Harit Dhara feed for cows  
↳ less methane waste

## Biotechnology for Human Health

1. Drug Discovery (e.g.) Alpha Fold / Grapple
2. Disease detection (e.g.) PCR, ELISA test
3. Vaccine to prevent disease  
(e.g.) m-RNA, Adenovirus Vaccine
4. Prediction of disease : Gene Mapping
5. Curative Role → Stem cell therapy  
↳ CAR-T cell  
↳ Bio therapeutics

Bio E3 program of Govt of India  
will help in harnessing Biotechnology

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Ans 12.

Gaganyatri W. Cdr Shubhanshu Shukla

came back to earth after performing  
key space experiments aboard

Axiom - 4 → pathway to Gaganyaan

Gaganyaan Mission by 2030 → ISRO's crewed spaceflight  
Use of LVM-3 rocket  
Only 4th country in the world after  
Russia, US, China → India

Helping achieve India's broader  
National Objectives

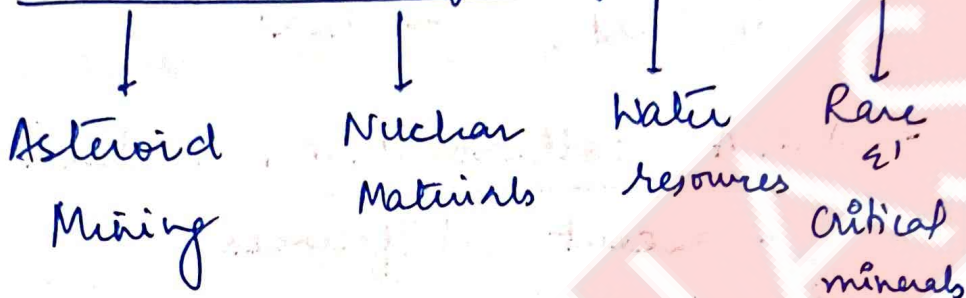
1. Establish India as Spacefaring nation. - top 4 in world
2. Pillion to Space based Missions like Moon station.

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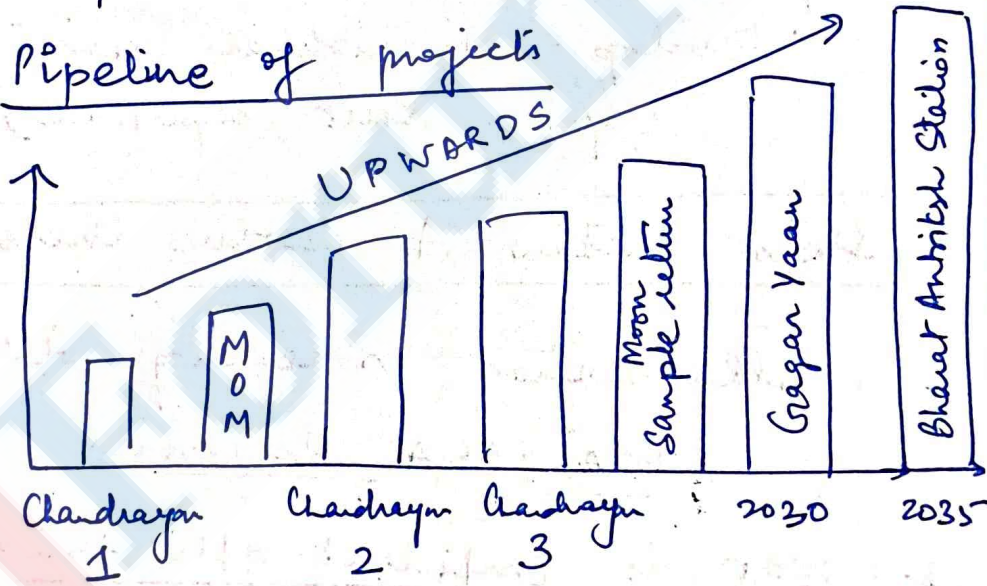
### 3. Economic benefits from Spaceflight



### 4. Encouraging STEM discipline

(e) Rakesh Sharma's role earlier

### 5. Pipeline of projects



### Challenges faced :-

- Cost limitation : Most least costly human space flight
- Timeline issue : Strict 2030 deadline  
↳ encourage risk

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# UPSC

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3. Human life safety

↳ first for ISRO

4. NASA collaboration: US-India ties

↳ recent differences

↳ US Prez cut budget of NASA

5. Import of rare earths from China

↳ Develop Atmanirbhar capacity  
(space suit, superfoods)

Steps taken to resolve these

1. Collaboration increasing with  
NASA, ESA, Roscosmos

2. ISRO is confident after Axiom 4

3. Graded trajectory: sample return

Mission critical

In built safeguards for ejection

and strong political support will  
be key to Gaganyaan success.

Ans 13.

Stampede is a man-made disaster which should be prevented at all costs

Recent stampedes (India) → RCB: Bengaluru celebration  
→ NDLS station stampede  
→ Goa temple stampede

Multiple factors responsible for stampede are:-

1. Structural factors

1. Instability of platform structure
2. Lack of exit - entry routes
3. Fire - electricity precaution not adhered to
4. Lack of local force coordination

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## 2. Management factors

1. Not employing enough guards
2. Non ticketing of program  
(e) Bengaluru stampede
3. Lack of information management  
(e) NDLS platform change last minute
4. Lack of Mock drills of exit

## 3. Crowd factors

1. Unruly crowd / Mob thinking
2. More than anticipated
3. Mismanagement of crowd  
↳ women, children, men together  
cramped up in one place

NDMA guidelines :-

### 1. Crowd profiling

{
   
 ↳ Youth event
   
 ↳ Classical singing event
   
 ↳ Sports celebration
 } Deal accordingly

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## 2. Evacuation planning

- ↳ Number of entry - exit routes
- ↳ entry route different than exit

## 3. Failure & worst case planning

- ↳ Fire & Police services coordination
- ↳ Mock drills beforehand

## 4. Communication infrastructure

- ↳ Clear, concise
- ↳ Radio communication between managers & guards
- No last minute changes ⇒ 2nd ARC

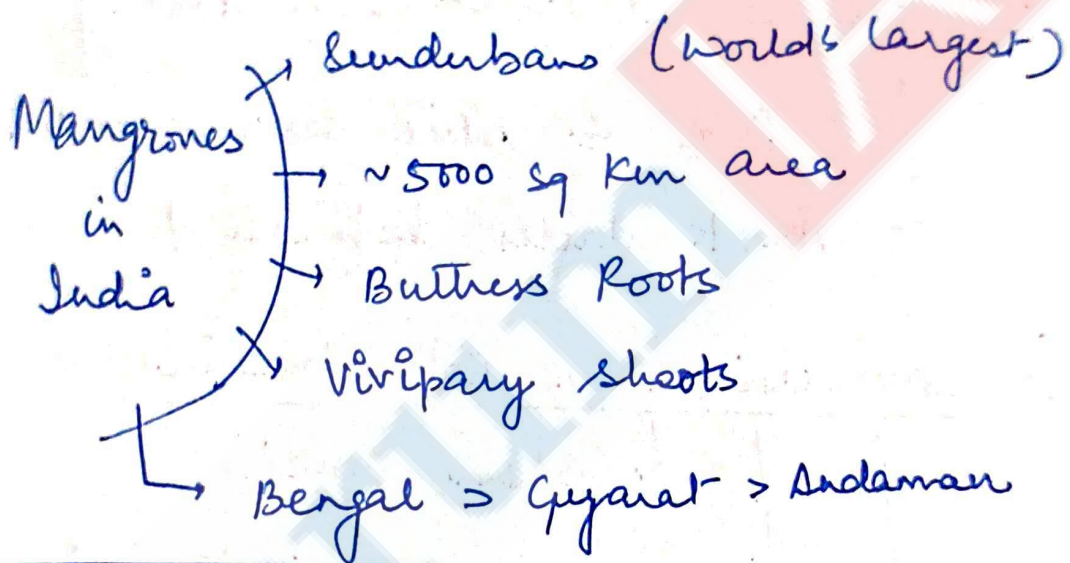
## 5. Use of AI, drones like in

Kumbh to identify trouble makers.

Besides these, local volunteers,  
Home Guards, retired personnel can  
be tapped for effective management

14

Mangroves are salt tolerant varieties of trees that grow at ecotones of coastal areas (sea and land)



## Contribution to Coastal economy

1. Provisioning services : food, medicine
2. Good source of timber (e.g.) Sundari trees
3. Tourism services (e.g.) eco tourism in Gujarat
4. Protect coastal infrastructure from wave erosion and cyclone

↳ penny saved is penny earned

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## Coastal ecology protect :-

1. Prevent coastal erosion
2. Shelter to fishes, animals  
↳ Hub of Biodiversity
3. Carbon sequestration : Reduce climate change impact

## Threatened by numerous factors

1. Sea level rise : Submerging beyond Copy capacity
2. Pollution discharge  
↳ Choking of roots with heavy metals (e.g) Arsenic in Bhitarkanika
3. Shrimp farming  
↳ Habitat destruction
4. Irresponsible tourism → infrastructure in place of mangroves
5. Plastic / Microplastics :- affect health

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6. Invasion of Latana Camara (C) in Goa mangroves.

7. Port building (C) Nicobar bay

Measures taken by Govt

1. Joining Mangrove Alliance for Climate (MAC)

2. Coastal Regulation Zones (CRZ) in Envt Protection Act 1986

3. MISHTI scheme for eco centric development

4. Blue flag beaches : prevent pollution

5. Waste management Rules (2011)

6. Protected area status (C) Man and Biosphere program

Involving local communities in Joint forest management has been effective

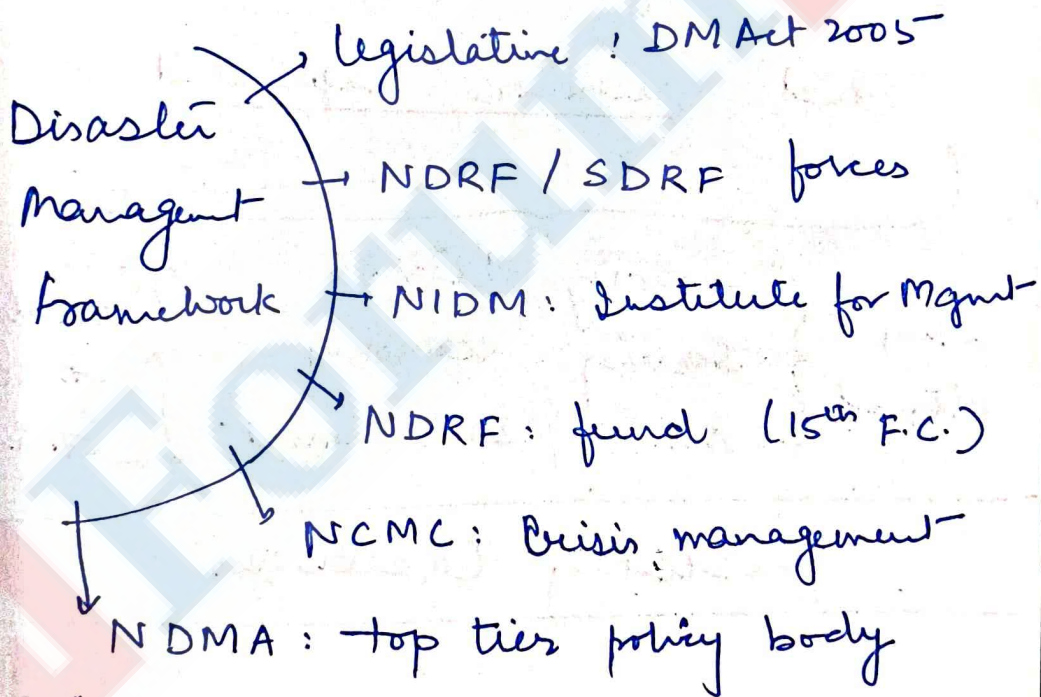
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# UPSC

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15

Recent Uttarakshi floods have shown challenges in timely response & coordination during crises.



Improvements post 2005

1. Incorporating Disaster risk in developmental plans
2. local capacity building

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# UPSC

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3. Traditional structure studies

(e.g.) Dhajji Dewari in J&K

4. Better coordination of  
National - State - Dist Committee

5. Funds for Disaster prevention  
and response separated

SDG aligned { Saving lives  
Saving economy  
Saving environment } Sendai  
2030  
Goals

persisting Challenges

1. Lack of Early Warning Systems

↳ Delayed response

2. Episodic response : focus on relief

not prevention

(e.g.) 2013 floods → 2025 Uttarakashi

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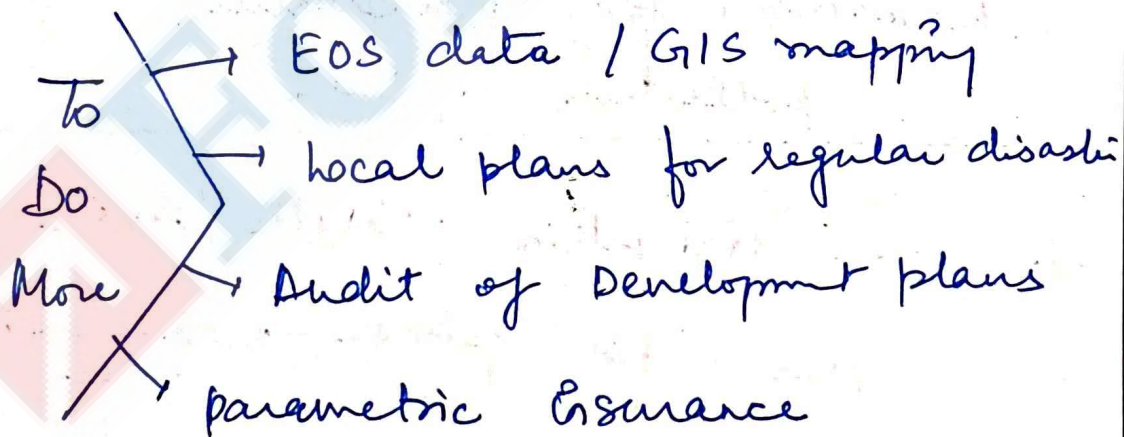
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3. Coordination issue due to Centre state differences @ Kerala landslide blame game

4. Outdated Hazard maps  
↳ delays timely relieve

5. local bodies dependent on State disaster force to arrive  
↳ need capacity building in high risk areas



Educating adults & children

alike will help fulfill

Sendai Goals of reducing loss of life & property

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# UPSC

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16

India is the largest extractor of groundwater in the world ( $> 25\%$  total) with only 2.4% land

Groundwater Crises

- 171% extraction rate in aquifer dominant regions
- water availability  $< 1400 \text{ cc/m}$  (falkenmark index)
- Decline in water table by  $0.5 \text{ m/yr}$  ~ (CWMI Niti)

Reasons for groundwater pollution in India

1. Over irrigation : Water / Power free for farmers  $\rightarrow$  unabated use
2. Crop intensity and pattern
  - ↳ (a) Sugarcane 10% land but  $> 60\%$  water use total
3. Seepage of fertilisers : uneconomic use

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# UPSC

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4. Mining - Open Cast & drilling  
↳ groundwater pollution

5. Salt water intrusion in coastal areas

6. Poor seepage → Choked rivers  
↓ Concrete jungles  
less inflow to dilute pollutive potential

## Remedial Measures

1. Groundwater recharge

(e) Palar Pani, Tehads

2. Drop irrigation / sprinkler : Reduce wastage from tubewells

3. Nano Urea : Less overuse, less seepage into ground.

4. Scientific Closure of Mines post use

# UPSC

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4. Waste water treatment

(a) SBM ODF++ Component

5. Industrial responsibility under CSR  
↳ generate funds for treating pollution

Initiatives taken by Govt

1. National Aquifer Mapping Mission

2. Atal Bujal Yojana

3. Water Act 1982 : Central Groundwater Board

4. Groundwater Index by Niti

5. AMRUT Sarovar → Recharge

6. Prevention of pollution &

Waste water treatment

Mission Kakatiya & Leaf Check Dams

are best practices to preserve & recharge ground water.

# UPSC

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17

As per Section 111 of Bharatiya Nyay Sanhita : Organised Crime is any illegal activity done by two or more people in consonance

Section 113 of BNS defines terrorism as any activity done to instill fear in people, threaten unity & integrity of India by violent means.

Linkage between terrorism & organised crime

1. Terrorism through funds of organised crime  $\Rightarrow$  fake currency notes
2. Organised crime depending on terrorism for violence  $\Rightarrow$  used in arms purchases

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# UPSC

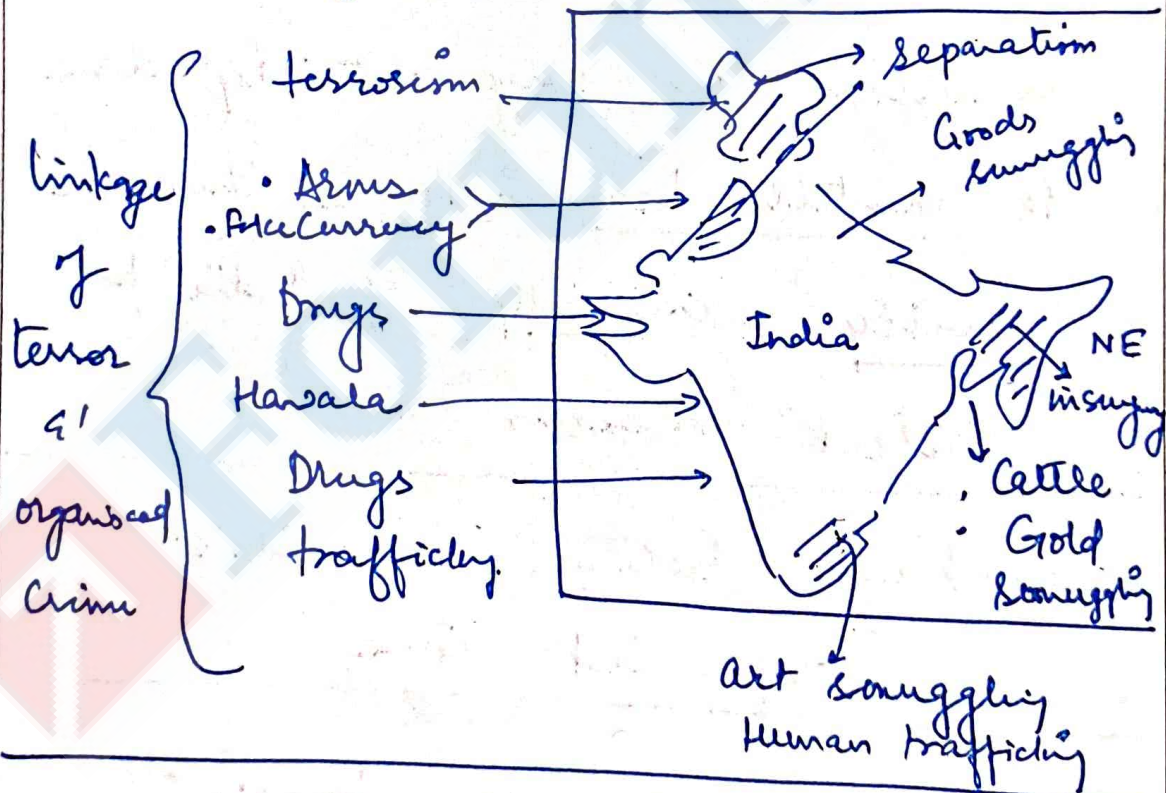
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(e) Dawood Ibrahim train blasts in Mumbai

3) Difficult to trace due to lack of overt convergence

(e) use of Hawala, smuggling

4) Challenge to internal security



Measures suggested :-

1. Intelligence gathering improve

(e) Multi Agency Centre  
NATGRID

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# UPSC

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2. Local police + Security forces

↳ Joint training & operations

(e) op. Mahadev post pahalgam

3. International Collaboration & treaties

(e) op. Sensitive Myanmar

↳ CCIT at UN must be pushed

4. Local intelligence assets : curb on

smuggling rings / routes (e) NTRC use.

5. Border fencing (CIBMS)

6. Digital measures

Basel Convention

Customs intelligence (CDRI)

Finance Intelligence Unit

Using both

Hard + Soft

measures is the need of hour

to prevent this Unholy Nexus

# UPSC

12

Area of violence of <sup>North east</sup> ~~left wing~~

extremism has reduced. ~~from~~

250 deaths (2014)  $\rightarrow$  16 deaths (2024)

NMHA data.

Still it is continuing in some parts

1. Jal - Jungle - Jameen issue

- ↳ forced displacement of tribals
- ↳ Development Deficit

2. Governance deficit

↳ Lack of PESA implementation

↳ Non autonomous Councils

3) External support

↳ arms ideology

↳ AFSPA issue  
finances

4) porous borders

Myanmar

↳ free Movement Regime

5) Ethnic Divide

↳ Naga kuki

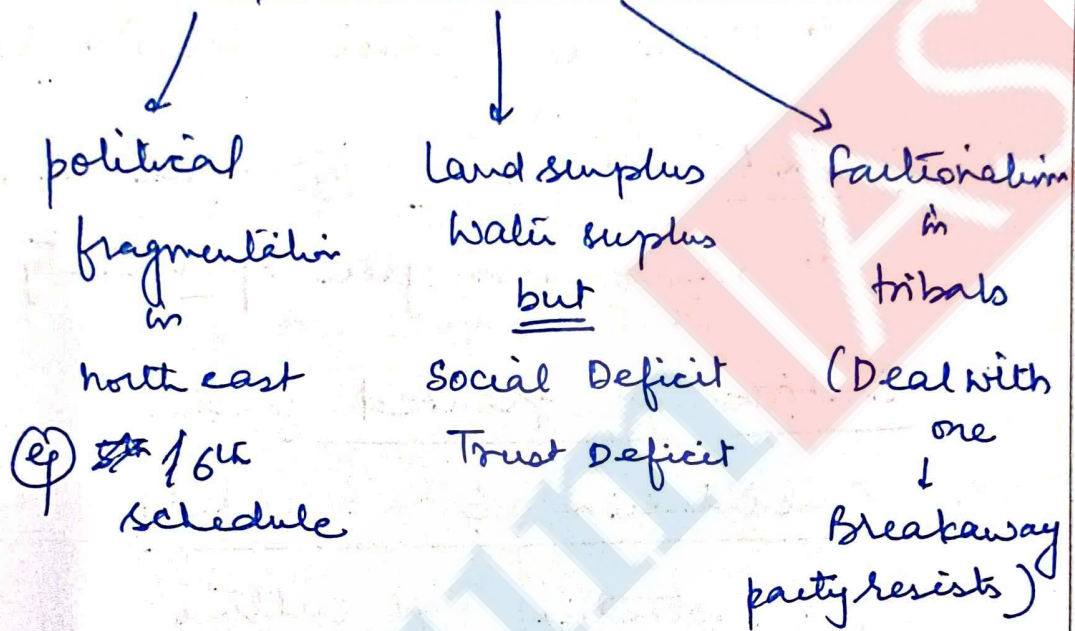
↳ Kuki Meitei

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## Impediments to peace



Range of interactions has led to improvements

1. Ashtalaxmi (8 states)

↳ Development as antidote

2. Infrastructural Development

↳ Agartala Akhama Rail  
Kaladan Multi Modal Project  
↳ Inland Waterway Act

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3. Cultural Connect

↳ UNESCO Chairades Moidams

4. Promote Tourism (e) Loktak lake

↳ economy as glue of society

5. Autonomy granted under

Constitution 6<sup>th</sup> schedule

↳ protection of culture

Hard interventions also took up

↓  
Operation  
Suroise  
in  
Myanmar

↓  
Bhutan  
Indian  
Army  
joint ops

↓  
FMR  
reduced  
to  
8 km

↓  
Border  
fencing  
by  
MHA

Vision of PM Modi is

North east is not a frontier

but front runner of growth

# UPSC

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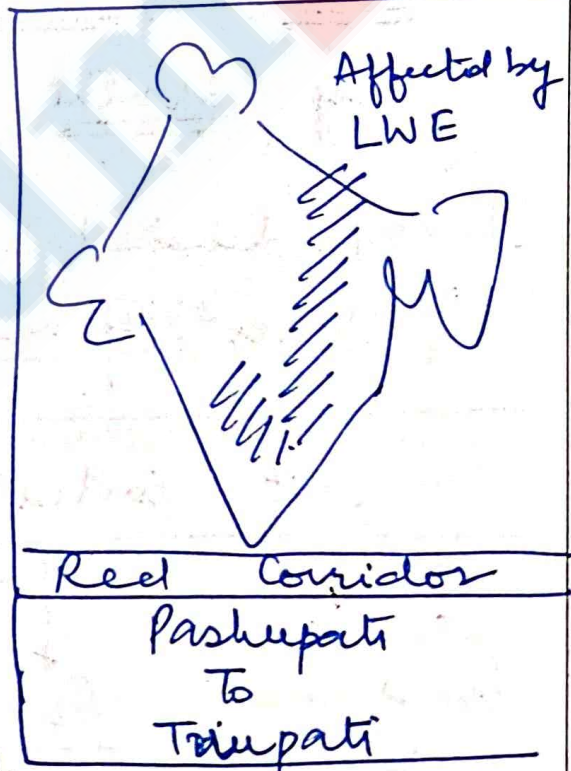
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19

Left wing extremism is the ideology of Maoists focussed on violent struggle to uproot democratic system

## LWE : Snapshot

- Reduced from 200 distt to 16 in 2024
- Hard + Soft measures of Govt
- ⊕ WHAM approach



## Reasons for continuation

1. Governance Deficit

⊕ Dam displacement

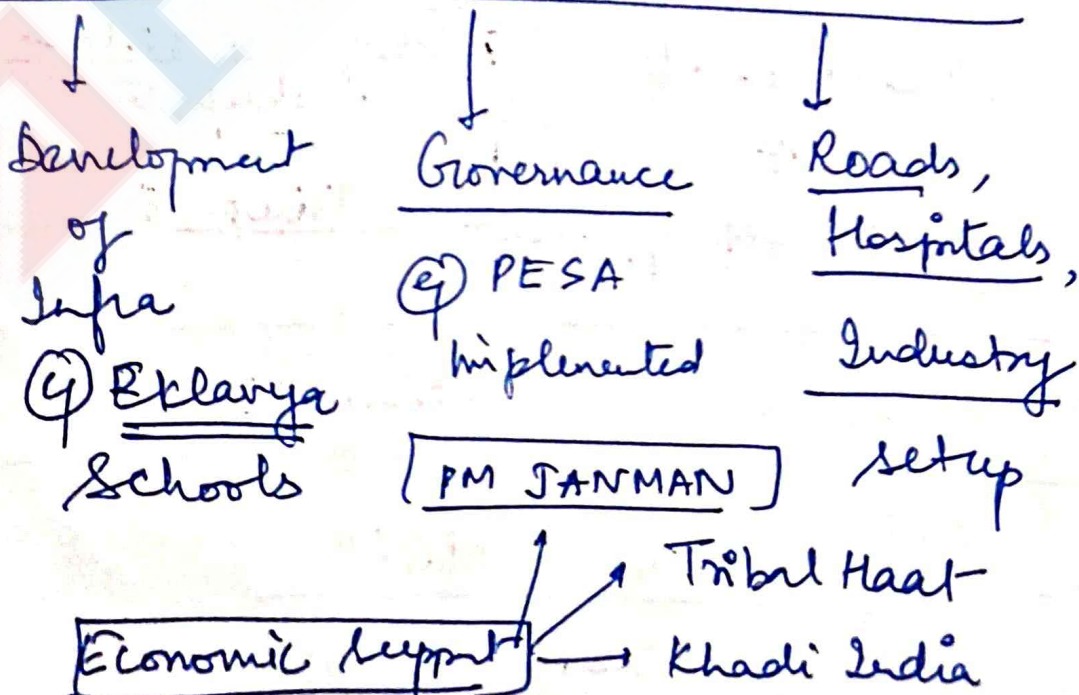
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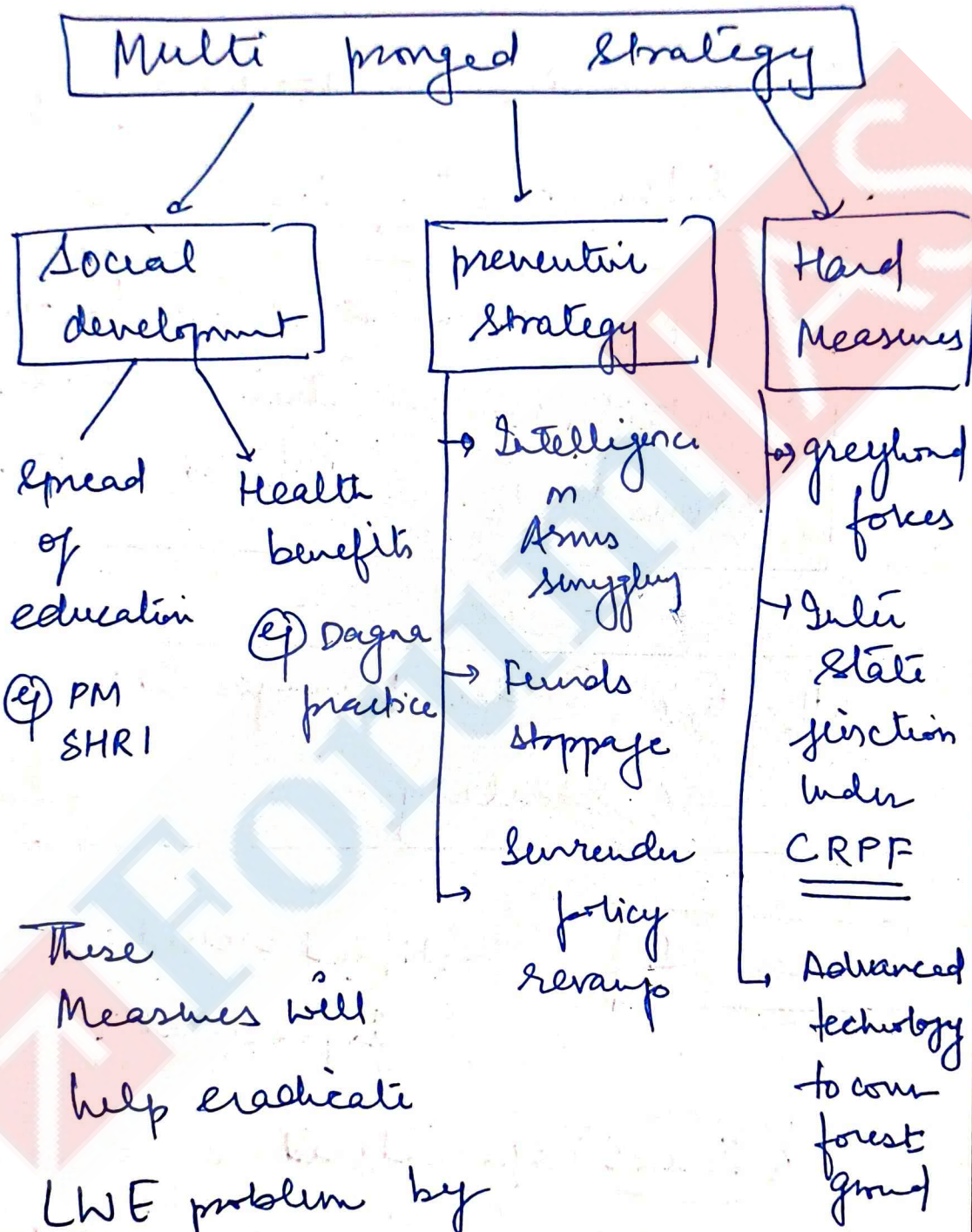
- 2) Non implementation of FRA 2006 in spirit
- 3) lack of Development of region  
↳ prone to brainwash by LWE ideology
- 4) Funds & functionaries support  
by frontal organisations (Urban Nazalism)
- 5) High handed approach of police forces (e) Salwa Judum

## Govt initiatives taken



# UPSC

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These Measures will help eradicate LWE problem by

March 2026 : Goal by

Hon'ble Home Minister

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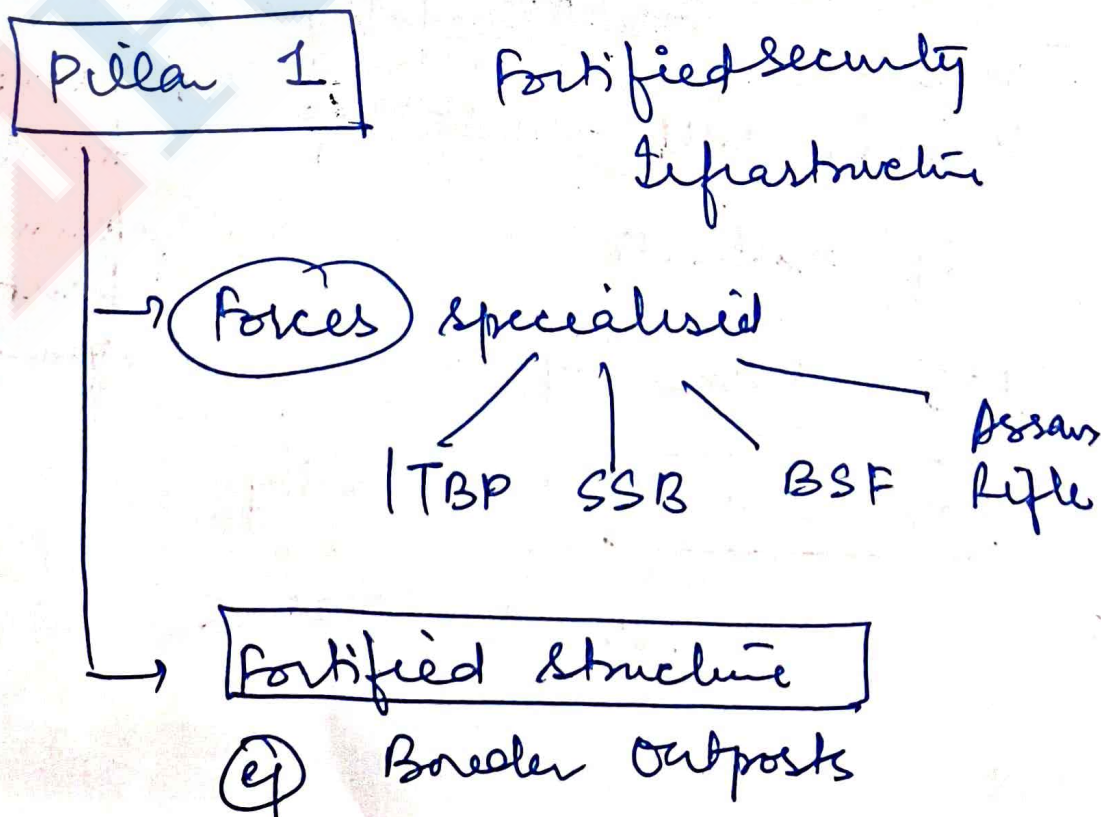
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20

India's border is > 15000 km long  
with different terrains

Riverine	←	Bangladesh	4000 km
Mountainous	←	China	3600 km
Porous border	←	Pakistan	3300 km

Effective border management  
Strategy



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

# UPSC

Candidates must not write on this margin

- Floating border posts
- Fenced border (Madheswar Gupta Committee)
- Night Vision / Drone Surveillance
- BRO : Shekhar Sen Committee
- Air strips : Daulat Beg Oldie

## Social - economic development

- Vibrant Villages programme
- Op Sadbhavana by Army
- Border Area Development programme

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

# UPSC

Candidates must not write on this margin

→ Schooling & Health : Hospitals

→ Tourism promote

↳ Dekho Apna Desh

These two pillars will ensure

Safe borders for country

& development of borders

communities

(Sabka Prayas, Sabka Vikas)