

**ForumIAS****GENERAL STUDIES**

Name Of Candidate	Umoharathi N		
Roll No.	1910059002	Date:	29-7-22

Time Allowed: Three Hours

Maximum Marks: 250

INDEX TABLE			INSTRUCTION
Q. No.	Max. Marks	Marks Obtained	
1			1. Please do furnish Name, Email, Roll No and Mobile in the answer sheet.
2			2. There are TWENTY questions printed in ENGLISH & HINDI, all questions are compulsory.
3			3. The number of marks carried by a question/part is indicated against it.
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.
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.
6			<i>Any specific messages for ForumIAS Mentors/Evaluators with respect to your copy? Write it here.</i> ----- ----- ----- ----- ----- -----
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Total:	250		
<b>Evaluator's Discretion:</b>			<b>For Student Only</b>
			Start Time   2:00
			End Time   5:00 PM
<b>Total Marks:</b>			<b>Mode Of Examination:</b>
			Online <input checked="" type="checkbox"/> Offline <input type="checkbox"/>
<b>Evaluator's Discretion:</b> 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
Language						
Structure						
Presentation						
Handwriting						
Content						
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**ADDITIONAL REMARKS**

2:00 PM  
2:00

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Q.1) The consequences flowing from genetically modified organisms are debatable, but the advantages justify the risk. Do you agree? Discuss. (10 marks, 150 words)

आनुवंशिक रूप से संशोधित जीवों (GMO) से निकलने वाले परिणाम बहस योग्य हैं, लेकिन इसके फायदे जोखिमों का औचित्य सिद्ध करते हैं। क्या आप सहमत हैं? चर्चा कीजिए। (10 अंक, 150 शब्द)

Genetically modified organisms are those whose genome has been modified for certain desirable characteristics.

**Advantages of GMO**

- Agricultural productivity - eg: BT cotton and yield increase at low cost
- Disaster management - eg: Drought, Heat resilient crops
- Food security & nutrition goals in cost effective way eg: Bangladesh Golden rice with Vitamin A related gene
- permanent cure to diseases - eg: correcting gene for hemophilia.
- public health management eg: introducing sterile mosquitoes to manage dengue.

## Risks involved

- can drive native biodiversity into competitive extinction  
eg: dwindling native strains of Cotton
- resilience developed by pests and insects
- offsite impacts (mutations) due to gene editing
- health risks of consuming GM based food  
eg: Cancer incidence in GM soy consuming populations of Europe
- high cost and dependency - for eg: GM seeds are terminator seeds by large monopolistic companies

In this light, there is need to proceed with caution. scientific risk studies, consensus development, precautionary principle should guide adoption in India.

**Feedback**  
(For OFFICE use only)

Structure/Presentation
Question Interpretation
Content
Value Addition
Total

Q.2) How are fuel cell electric vehicle (FCEV) different from battery electric vehicle (BEV)? Highlighting advantages of electric vehicles, suggest measures for accelerating e-mobility adoption in the country. (10 marks, 150 words)

ईंधन सेल इलेक्ट्रिक वाहन (FCEV) बैटरी इलेक्ट्रिक वाहन (BEV) से कैसे भिन्न हैं? इलेक्ट्रिक वाहनों के लाभों पर प्रकाश डालते हुए, देश में ई-मोबिलिटी अपनाने में तेजी लाने के उपाय सुझाएं। (10 अंक, 150 शब्द)

Electric vehicles run on electric energy which is pumped through battery installed. Currently electric vehicles (EV) account for 4.5% of all vehicles.

Types of EV

Fuel cell electric vehicle	Battery EV
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<ul style="list-style-type: none"> <li>→ Runs on a fuel cell</li> <li>→ can be recharged by refueling, just like conventional vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Runs on a battery eg: Lithium battery</li> <li>Takes long time to recharge, like a mobile phone, computer</li> </ul>
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Advantages of EV

- ① Green transport - Release no CO<sub>2</sub>, helps bring down the CO<sub>2</sub> emissions from transport sector
- ② Import bill saved - by avoiding fossil fuel imports (so. currently)

- ③ Smooth performance - noise, energy conversion etc
- ④ Efficient energy usage - compared to Internal Combustion engines: energy burning is 40% efficient
- ⑤ Startups and innovation - along the supply chain. eg: pure EV startup of IIT-Hyderabad

Measures to promote e-mobility adoption

- consumer subsidies for 2-wheeler + four wheelers
- Expanding charging infrastructure (currently barely 1000 stations)
- Attracting investments to bring down cost (eg: subsidy 10000 or investment in EV in india)
- Immediate grievance redressal eg: EV fire incident

China invested in EV in public transport and 2-wheeler segment to create public acceptance of EVs, which accelerated adoption eventually.

Feedback	
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Q.3) Space based technologies are helpful in not only monitoring development, but also enhancing it. Discuss. (10 marks, 150 words)

अंतरिक्ष आधारित प्रौद्योगिकियां न केवल विकास की निगरानी करने में सहायक हैं, बल्कि इसे बढ़ाने में भी सहायक हैं। चर्चा कीजिए। (10 अंक, 150 शब्द)

Space economy constitutes 0.26% of GDP, and its technologies have multiple benefits.

Space based technologies in monitoring development

- Monitoring Land use changes in and around urban areas, eg: Illegal encroachment
- Remote sensing satellites for forest cover changes, eg: Forest survey of India Report.
- Monitor changes in climate, eg: sounding rockets

Space technologies for enhancing development

- ① Inclusive education - eg: 'edusat' satellite for tele education in remote areas
- ② Universal health care - tele health through satellite internet

- ③ Agricultural productivity - weather forecasts for informed cropping decisions. eg: IMD forecasts
  - ④ Resource exploration & exploitation - eg: ISRO's role in identifying shale gas basins
  - ⑤ Disaster proofing development - eg: early warning systems by constant monitoring. eg: Landslide warning
  - ⑥ Digital divide closed through space based internet - eg: in remote hilly areas.
  - ⑦ Tangential benefit through commercialisation of technology - startups.  
 eg: Teflon in Launch vehicles → nonstick cook ware manufacturing → employment
- In this regard India is rightly promoting private sector participation through 'Inspire' 'NSIL' for better leveraging space technologies

Feedback (For OFFICE use only)	
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Q.4) Ensuring sustainable consumption and production patterns for an environmentally conscious world is not possible without fundamental changes in lifestyle. Discuss this statement in light of Lifestyle for the Environment (LiFE) Movement. (10 marks, 150 words)

जीवन शैली में मूलभूत परिवर्तन लाए बिना पर्यावरण के प्रति जागरूक दुनिया के लिए सतत उपभोग और उत्पादन पैटर्न सुनिश्चित करना संभव नहीं है। पर्यावरण के लिए जीवन शैली (LiFE) आंदोलन के आलोक में इस कथन की चर्चा कीजिए। (10 अंक, 150 शब्द)

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Q.5) Managing risks, rather than impacts, lies at the core of effective disaster management strategy. In light of this statement, describe the flood risk profile of India and evaluate preparedness for effective flood management.  
(10 marks, 150 words)

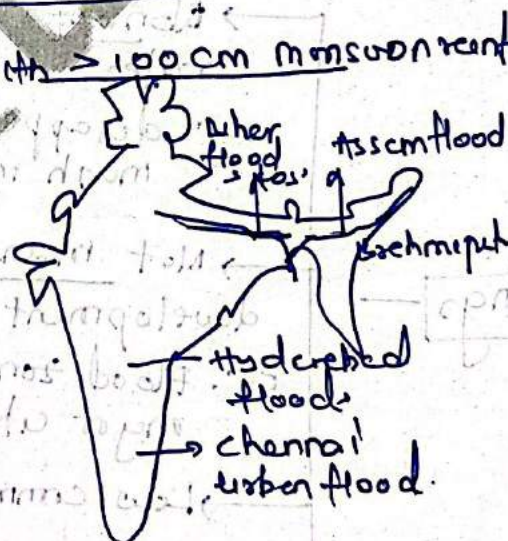
प्रभावों के बजाय जोखिमों का प्रबंधन, प्रभावी आपदा प्रबंधन रणनीति के मूल में निहित है। इस कथन के आलोक में, भारत के बाढ़ जोखिम प्रोफाइल का वर्णन करें और प्रभावी बाढ़ प्रबंधन के लिए तैयारियों का मूल्यांकन करें।

(10 अंक, 150 शब्द)

The sendai framework of disaster management advocates a shift from managing impacts to managing risks, in order to make disaster management preparedness + mitigation centric.

Flood risk profile of India

- ① 12% of area is prone to floods
- ② Associated with areas with > 100 cm monsoon rainfall
- ③ Rising frequency of flash floods
- ④ increasing vulnerability of urban floods
- ⑤ Human and natural causes at play
  - concretization
  - encroaching floodplains
  - monsoon rain
  - cloud burst
  - glacial outburst



Preparedness

- ① NDMA guidelines for floods including flash floods.
- ② Flood plain zonation for major river systems eg. Ganga zonation.
- ③ Early warning systems - eg. INCOIS alert, CFlows app.

Shortcomings

- Non enforcement of zonation rules  
eg. disappearance of pillakoral marsh in Chennai
- Not mainstreamed into development  
eg. Flood zonation not done in major cities
- Low community participation
- Inadequate flood shelter, structural + non-structural measures

Managing floods requires multi level planning ranging from river water interlinking to urban afforestation in an coordinated manner

<b>Feedback</b> (For OFFICE use only)	
Structure/Presentation	
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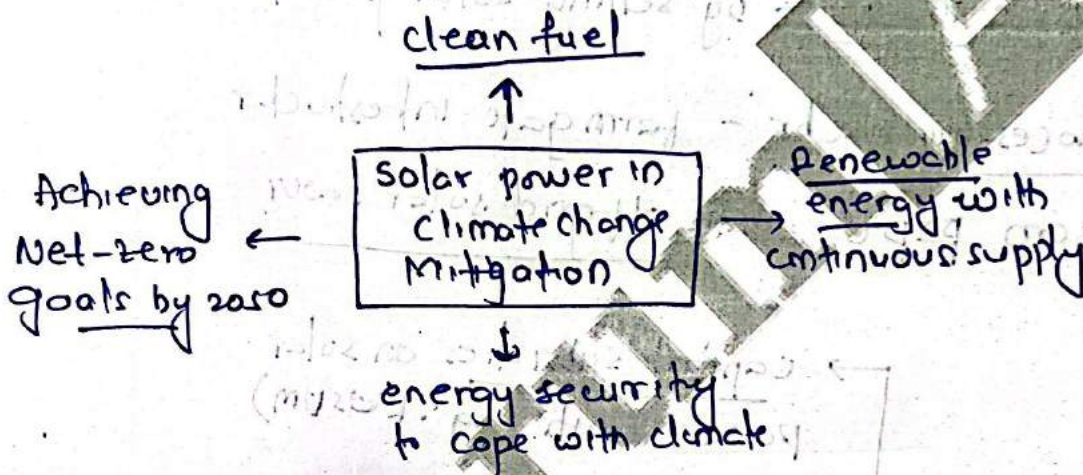
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Q.6) Solar power sector is not only leading the mitigation efforts against climate change, but the innovations in solar power can also accelerate adaptation of agriculture to a new reality of changed climate. Discuss. (10 marks, 150 words)

सौर ऊर्जा क्षेत्र न केवल जलवायु परिवर्तन के खिलाफ शमन प्रयासों का नेतृत्व कर रहा है, बल्कि सौर ऊर्जा में नवाचार भी बदली हुई जलवायु की एक नई वास्तविकता के लिए कृषि के अनुकूलन में तेजी ला सकते हैं। चर्चा करें।

(10 अंक, 150 शब्द)

At 55 GW India has 5th largest installed solar capacity in the world, with impressive growth rate.



solar power for accelerated climate change adaptation in agriculture

① precision agriculture in remote areas - solar power for running sensors etc

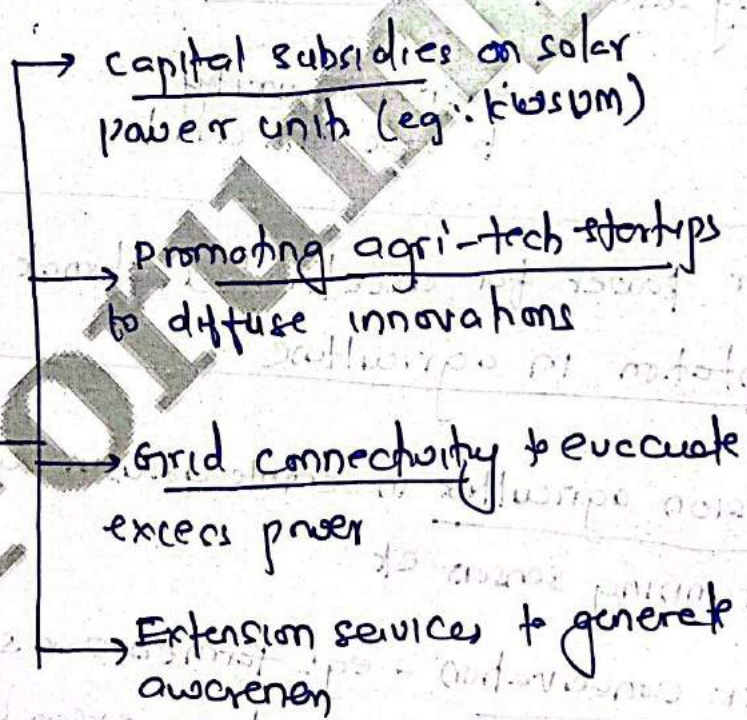
② water conservation - eg: farmers can sell excess solar power than waste it on excess water (Census scheme)

3) High-tech farming - for eg: running poly houses, artificial lighting/temperature to overcome climate shocks.

4) Diversified income - by selling solar power

5) Food processing sector - farm gate infrastructure and micro PPU's with off-grid solar power

Promoting solar power for agriculture



IEA dubbed "solar power as future of power". It can as well be leveraged to be ~~the~~ vehicle for 'climate smart agriculture'

Feedback (For OFFICE use only)

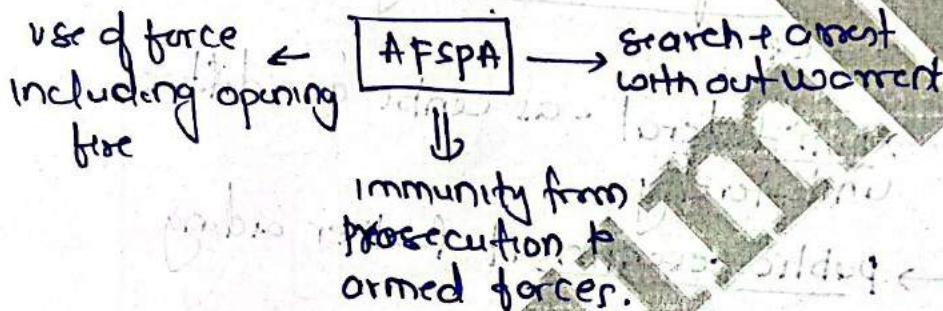
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Q.7) Necessitated by contingent law & order situation in the North-Eastern states in 1958, Armed Forces (Special Powers) Act (AFSPA) continues to be applicable even after six decades of its enactment despite widespread criticism. Critically evaluate the utility of AFSPA in light of prevailing security environment in the country. (10 marks, 150 words)

1958 में उत्तर-पूर्वी राज्यों में आकस्मिक कानून और व्यवस्था की स्थिति के कारण, सशस्त्र बल (विशेष अधिकार) अधिनियम (AFSPA) व्यापक आलोचना के बावजूद, इसके लागू होने के छह दशकों के बाद भी लागू है। देश में प्रचलित सुरक्षा वातावरण के आलोक में AFSPA की उपयोगिता का समालोचनात्मक मूल्यांकन कीजिए। (10 अंक, 150 शब्द)

AFSPA grants armed forces extraordinary powers to maintain order in 'disturbed areas'.



## Need for AFSPA

- ① Security threats - insurgency in northeast  
Militancy in J&K.
- ② Complex border management - Nexus of threat to organized crime, e.g. proximity to drug triangle.
- ③ Morale of forces through immunity.

**Criticism**

- Human right violations  
eg. Manorama case of rape
- civilian killings due to impunity  
eg. 2021- 16 civilians in Nagaland
- Lack of accountability in use of force
- Anti-federal - as centre can defuse unilaterally
- public resentment further aiding insurgency

In this regard following steps needed

**Supreme Court in 2016**

→ No immunity from prosecution in fake encounter

**Bhujay Hegde Committee**

→ review every 6 months with accountability measures

**Law Commission**

→ sensitize the forces on correct use.

Thus, extraordinary legislation must be used only in extraordinary cases.

**Feedback**  
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Structure/ Presentation
Question Interpretation
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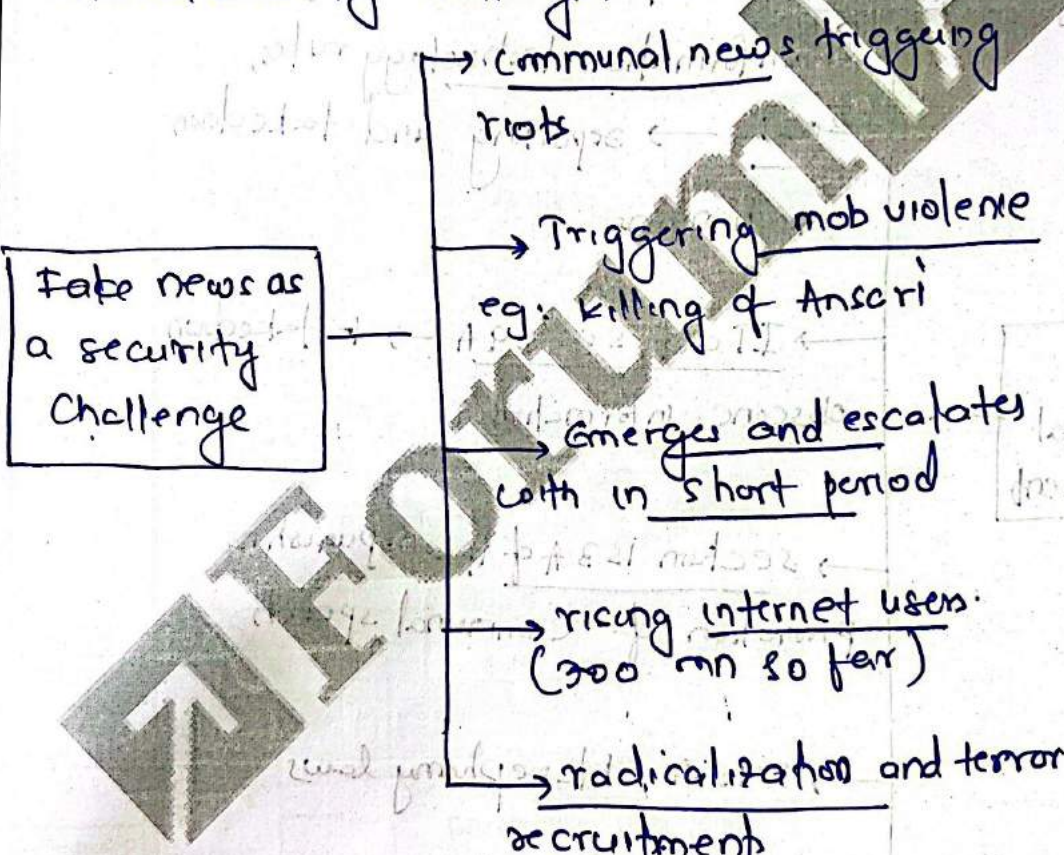
Q.8) Why has fake news on the internet emerged as an internal security challenge? How can we identify a fake news? Also, throw light on legal and institutional arrangements to tackle fake news.

(10 marks, 150 words)

इंटरनेट पर फेक न्यूज आंतरिक सुरक्षा चुनौती के रूप में क्यों उभरी हैं? हम एक फेक न्यूज की पहचान कैसे कर सकते हैं? साथ ही, फेक न्यूज से निपटने के लिए कानूनी और संस्थागत व्यवस्थाओं पर प्रकाश डालें। (10 अंक, 150 शब्द)

Bangalore communal riot of August 2000 clearly

highlighted the rise of fake news as a key internal security challenge.



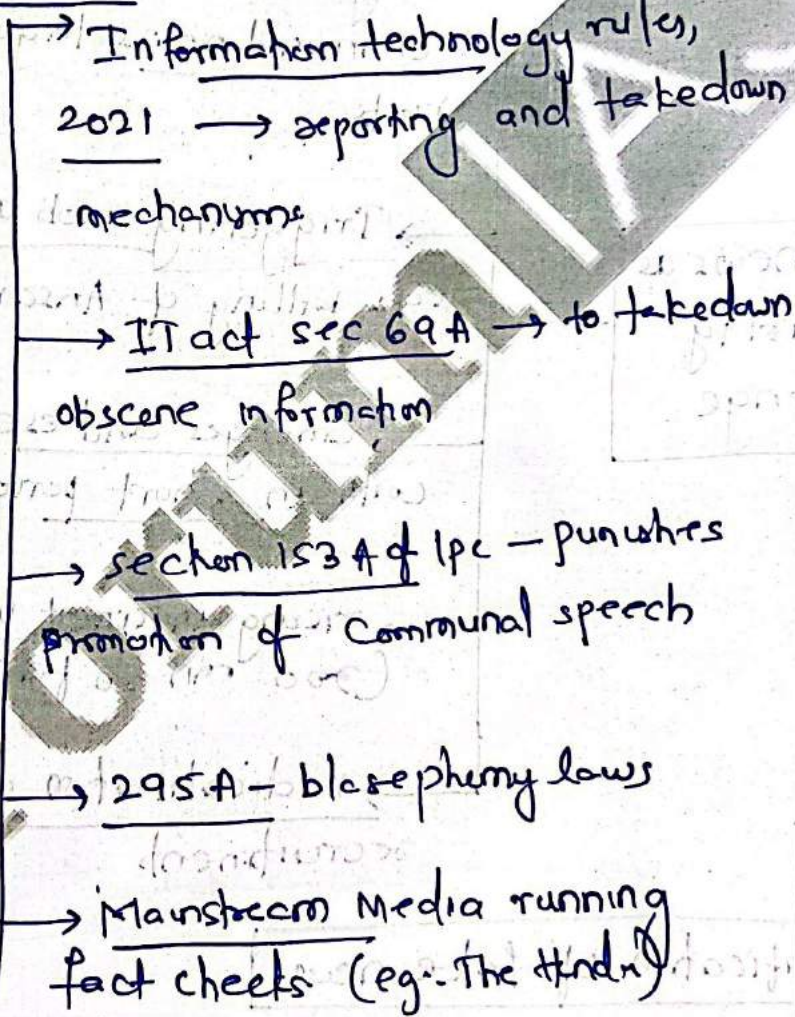
Identification of fake news

① use of extreme statements



- ② Lacks specific details and is vaguely worded
- ③ Highly viral in character
- ④ Using fact check websites (eg: Alt News)

legal & institutional arrangements



sensitization of the problem, promoting quality journalism, and exploring methods like "Truth sandwich" will be helpful.

Feedback	
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Q.9) Discuss the salient features of Agnipath scheme. Underlining the benefits of the scheme, mention ways to overcome associated challenges. (10 marks, 150 words)

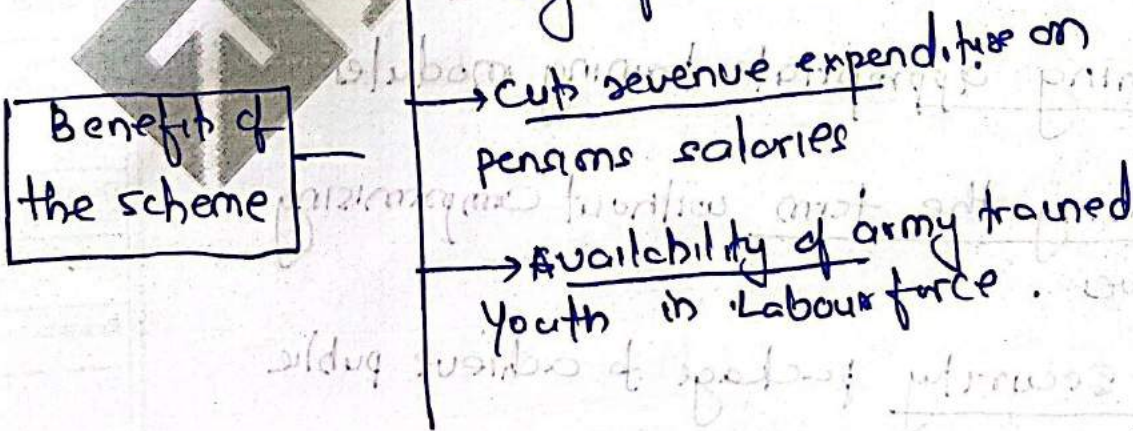
अग्निपथ योजना की मुख्य विशेषताओं की चर्चा कीजिए। योजना के लाभों को रेखांकित करते हुए, संबंधित चुनौतियों को दूर करने के तरीकों का उल्लेख करें। (10 अंक, 150 शब्द)

Agnipath scheme has been launched as a part of modernization and reforms of defence force.

security forces recruited on 4 year tenure basis



Those exiting after 4 year given one time financial package



Measures to overcome challenges

- popular back lash due to package associated with permanent army job.
- 4 years not sufficient to create combat ready force
- Lack of motivation due to job insecurity
- Large unemployed youth every four years

Measures to overcome challenges

- ① Designing appropriate training module
- ② increasing the term without compromising objectives
- ③ social security package to achieve public consensus

Reform is much needed, but must be executed in a humane and socially acceptable manner

**Feedback**

(For OFFICE use only)

Structure/ Presentation	
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Q.10) Examine how advancements in technology has allowed organize crime syndicates to not only expand but also diversify their activities. Also recommend suitable measures to tackle the menace of organized crime. (10 marks, 150 words)

परीक्षण करें कि कैसे प्रौद्योगिकी में प्रगति ने संगठित अपराध सिंडिकेट को न केवल विस्तार करने बल्कि उनकी गतिविधियों में विविधता लाने की भी अनुमति दी है। संगठित अपराध के खतरे से निपटने के लिए उपयुक्त उपायों की भी सिफारिश करें। (10 अंक, 150 शब्द)

When two or more people undertake illegal activities to obtain profit, it is called organized crime. With its nexus with Money laundering & terrorism it is a major security threat.

Technological  
advancements  
aiding organized  
crime

- cyber crimes - eg. ransomware attacks, identity theft.
- use of darknet, to plan and escape scrutiny
- use of cryptocurrencies to carry transactions and launder money.
- spread of internet - global scale operations. eg. global drug syndicate.
- encryption technology + secure communication with terror groups

## Measures to tackle the menace

- ① Bilateral regulation of crypt currencies
- ② Quantum computing to break the immunity of darknet
- ③ clear rules and tracking of cross border digital transactions
- ④ updatation of kyc norms to tackle moneylaundering
- ⑤ Technology capacity building of security forces — police, Enforcement Directorate.

Recently in an operation H A E C H I I - Interpol and 28 government effectively busted cyber based organised crime networks spread across countries. such global cooperation is need of the hour

### Feedback

(For OFFICE use only)

Structure/  
Presentation

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Addition

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 26) Nanotechnology is a 21st-century, interconnected science that has revolutionary applications across sectors. In this perspective, discuss the relevance of nanotechnology for socio-economic development in the country. (15 marks, 250 words)

नैनोटेक्नोलॉजी एक अंतर-अनुशासनात्मक और परस्पर जुड़ा हुआ विज्ञान है जिसके सभी क्षेत्रों में क्रांतिकारी अनुप्रयोग हैं। इस परिप्रेक्ष्य में, देश में सामाजिक-आर्थिक विकास के लिए नैनो प्रौद्योगिकी की प्रासंगिकता पर चर्चा करें।

(15 अंक, 250 शब्द)

Nanotechnology involves manipulation of materials at nano scale to achieve desirable properties (1-100nm)

High conductivity

small size → lightness

Nanoscale

high surface area

high strength

nuclear physics

Material science to study behaviour

interdisciplinary and interconnected science

Quantum Physics

organic and inorganic chemistry combined.

eg: biodegradable Carbon nanotubes

## Relevance for socio economic development

### Health care

- Nano capsules for targeted drug delivery
- Nano fibres for pesticid & cost effective diagnosis  
eg: Artery Choking
- Nano robot to repair cells and tissues remotely
- Nano sponges to absorb toxins in blood.

### Agriculture

- Nano gels for soil moisture retention → Drought proofing
- Nano formulation of fertiliser & pesticide → cost effective plus minimal wastage
- Nano sensors for precision agriculture eg: Israeli farm

pollution & waste management

→ nano sensors to monitor pollution levels for early warning system

Defence and military preparedness

→ nano sensors for remote surveillance  
 → nano fabric for light weight military suit  
 → Bullet proof vest eg. kevlar based

space sector development

→ lighter and higher launch vehicles → bring down cost  
 → nano sensors to monitor satellite environment

In this light, the nano mission, nanotechnology and science initiative must be leveraged to bring down cost and guide research towards socio-economic development

**Feedback**  
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Structure/ Presentation
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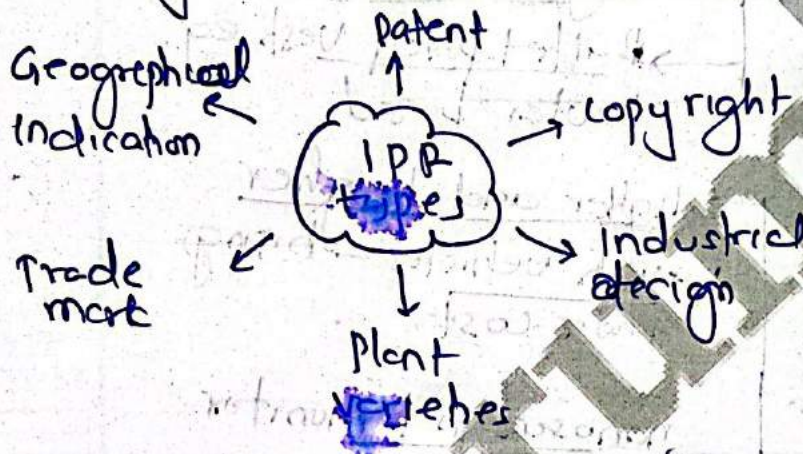
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Q.12) The increasing demand for stronger Intellectual Property Rights (IPR) protections is motivated by a desire to invigorate a groundswell of innovation, but it is more likely to lead towards IP monopolies. Examine. (15 marks, 250 words)

मजबूत बौद्धिक संपदा अधिकार (IPR) सुरक्षा की बढ़ती मांग नवाचार के आधार को मजबूत करने की इच्छा से प्रेरित है, लेकिन इससे बौद्धिक संपदा (IPR) के एकाधिकार की ओर ले जाने की अधिक संभावना है। परीक्षण करें।

(15 अंक, 250 शब्द)

Intellectual property refers to creation of mind.  
Intellectual property right (IPR) allow creator to enjoy economic benefit of innovation.



## Benefit of rising demand for IPR protections

- ① encourages further innovation - eg: patents role in development of covid-vaccine
- ② commercialization of research - For eg: pure EV project of IIT-Hyderabad

- ③ startups and manufacturing growth - For eg: IPR in mobile phone technologies
- ④ Brings down cost of technology for social good. For eg: declining cost of smart phones.
- ⑤ Agricultural productivity - eg: development of new varieties of plants.
- ⑥ Competitive innovation and growth - eg: MSME growth through 'petty patents' in Southeast Asia

Risk of Creation of IP Monopolies

- Evergreening of patents - eg: Glaxo case
- Large companies greater capacity to invest and file patents
- Higher cost of product - eg: cost of ART treatment for HIV
- Commercialization of science eg: No TRIPS waiver for COVID vaccines
- prohibit free exchange of scientific knowledge

Measures to balance the benefit + risks

- ① Strong criteria to award patents - eg: No evergreening
- ② Encourage grassroots IPR - eg: plant varieties by farmers, utility patents by MSME
- ③ Reduce red tapism in genuine patent demand eg: online procedures
- ④ Compliance reports on 'working of IPR' in the country.
- ⑤ Public funding of R&D (currently 0.67%) to promote social intellectual property.

IPR are a double edged sword. It must be leverage to promote innovation, but without compromising goals of inclusive + sustainable development

**Feedback**  
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Structure/ Presentation
Question Interpretation
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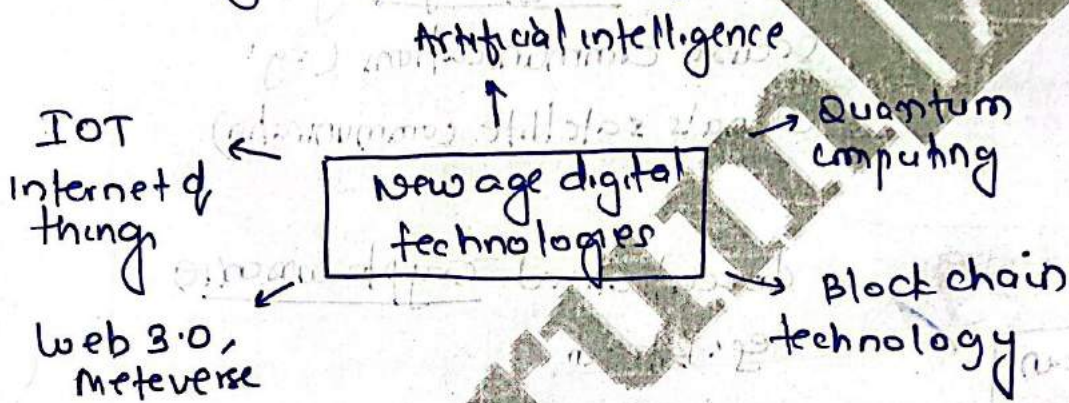
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Q.13) New age digital technologies are creating disruptions that open fascinating opportunities and pose frightening threats. Give an account of how digital disruptive technologies are changing our lives. (15 marks, 250 words)

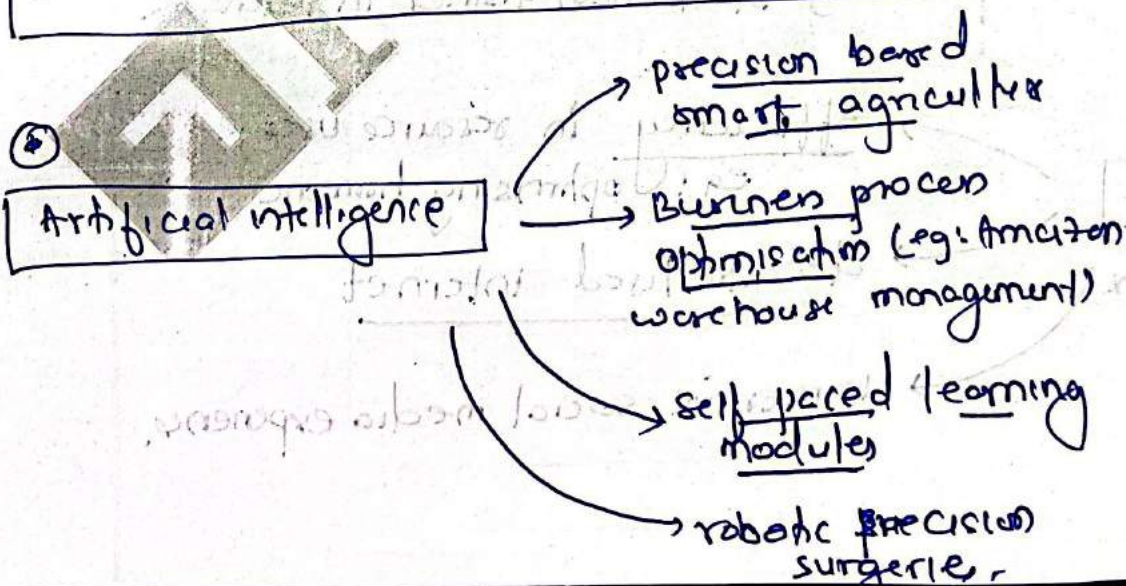
नए जमाने की डिजिटल प्रौद्योगिकियां व्यवधान पैदा कर रही हैं जो आकर्षक अवसरों को खोलती हैं और भयावह खतरे पैदा करती हैं। डिजिटल डिसरप्टिव प्रौद्योगिकियां हमारे जीवन को कैसे बदल रही हैं, उनका लेखा-जोखा दीजिए।

(15 अंक, 250 शब्द)

Technology is often termed as double edged sword. This is more true than ever in case of New age digital technologies.



Digital disruptive technologies in changing our lives



**Quantum Computing**

- aiding in research of universe
- powerful and accurate weather + climate forecasts
- Quantum cryptography for secure communications (eg: China's satellite communication)

**Blockchain technology**

- decentralised crypto currencies  
eg: Bitcoin
- Health, land, financial record management  
eg: Blockchain district in Telangana

**IOT + Urban + Metaverse**

- efficiency in resource usage  
eg: Optimising home energy use
- decentralised internet
- Immersive, social media experience.

Challenges and frightening threats

- ① Violation of privacy through data stealing + harvesting  
eg: manipulative targeted Ads on youtube
- ② social disruption through deep fakes, and other videos.
- ③ Democratic destabilisation - for eg: Cambridge Analytica data scam in USA president election
- ④ Increase inequalities - only 29% broadband penetration in rural areas, so villages left out
- ⑤ Ethical issues - the ethics behind AI systems
- ⑥ social psychological issues - social media usage and suicide tendency in teens; loss of human contact

As WEF highlighted people-centric regulation, code of ethics, public funding can help guide technologies in right direction.

**Feedback**  
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Structure/ Presentation
Question Interpretation
Content
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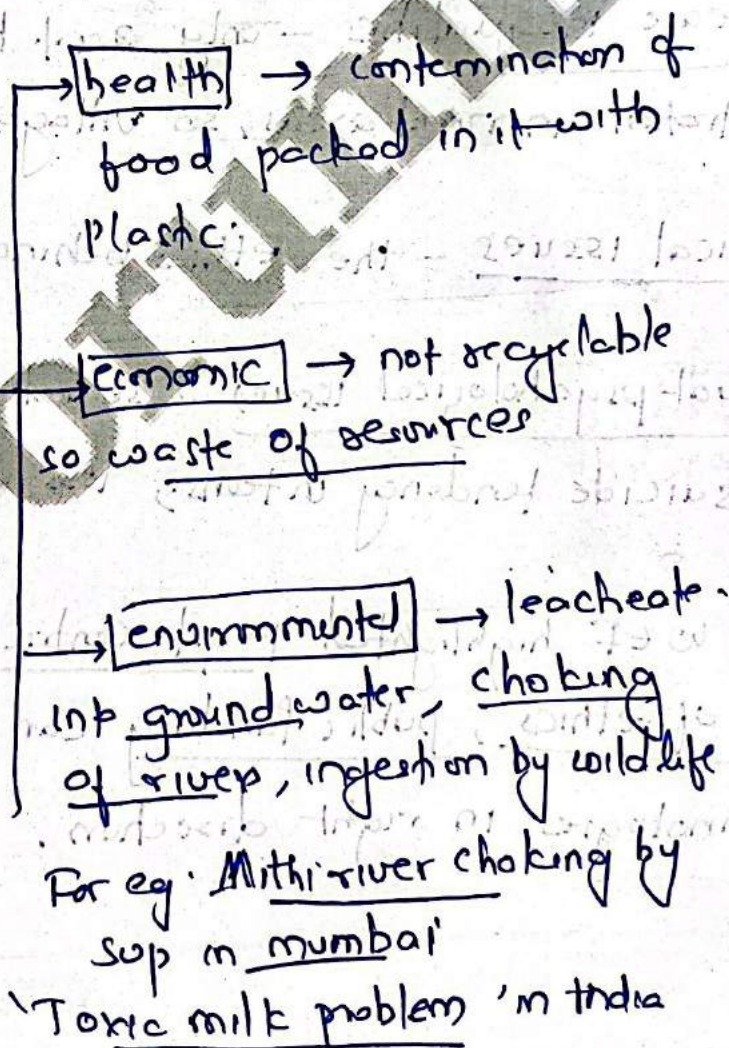


Q.14) Single use plastic (SUP) is a health, economic and environmental scourge, that requires governments to regulate, businesses to innovate and individuals to act. Examine in context of recently introduced ban on SUPs. (15 marks, 250 words)

सिंगल यूज प्लास्टिक (SUP) स्वास्थ्य, आर्थिक और पर्यावरणीय संकट है, जिसके लिए सरकारों को विनियमित करने, व्यवसायों को नवाचार करने और व्यक्तिगत रूप से कार्य करने की आवश्यकता होती है। सिंगल यूज प्लास्टिक पर हाल ही में शुरू किए गए प्रतिबंध के संदर्भ में परीक्षण करें। (15 अंक, 250 शब्द)

As per CPCB India generates 3.2 mT of plastic waste annually, of which 40% is the tricky single use plastic.

single use plastic  
SUP scourge



The plastic waste management rules, 2021 banned selected SUP items from September 2022 :

- Deterrence through penalties - a common global practice
- encourages use of alternatives

But effective management requires a larger approach than mere bans.

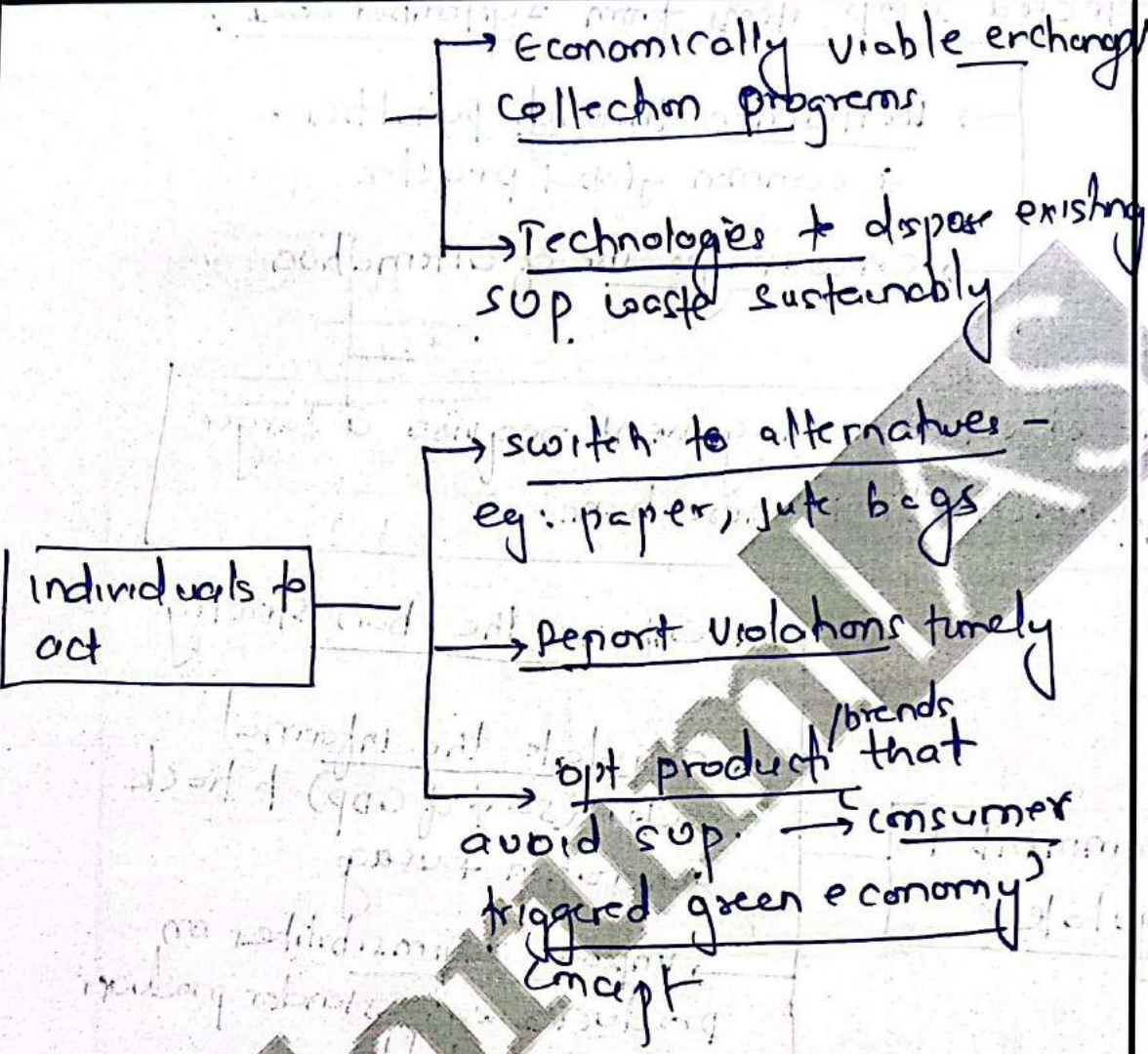
Government to regulate

- enforce the ban strictly
- regulate the informal sector (sort of GDP) to track generation + usage
- impose responsibilities on producers eg: Extended producer responsibility
- incentivise alternatives - eg: Capital + other subsidies on 'green plastics'

Businesses to innovate

- invest in alternative plastics  
eg. biodegradable sanitary pads by Carmee





Thus action is required from every stakeholder, as eliminating plastics is linked to multiple SDG goals (SDG. 13, 10, 15, 11).

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**Q.15)** Green hydrogen can be the engine of a sustainable economy, but it would require crossing financial and technological barriers. Discuss the reasons for increasing interest in green hydrogen and challenges in its adoption as the fuel of the future. (15 marks, 250 words)

ग्रीन हाइड्रोजन एक स्थायी अर्थव्यवस्था का इंजन हो सकता है, लेकिन इसके लिए वित्तीय और तकनीकी बाधाओं को पार करना होगा। ग्रीन हाइड्रोजन में बढ़ती रुचि के कारणों और भविष्य के ईंधन के रूप में इसे अपनाने में चुनौतियों की चर्चा करें। (15 अंक, 250 शब्द)

Green hydrogen refers to hydrogen generated by using renewable power. The green hydrogen policy' envisions it as vehicle for sustainable economy.

Reasons for interest in Green hydrogen

- Green transportation - Green hydrogen is a clean fuel. Helps cut carbon footprint (18% from transport sector)
- Saves import bills - As it is domestically produced fuel
- Energy security - Not subject to global price and other shock. (Tackles inflation)
- Green industry - H<sub>2</sub> a raw material in cement and other industries

→ Potential to trigger startups and innovation along the supply chain

→ Growth of renewable power - Green H<sub>2</sub> as storage fuel.

solar power → convert to hydrogen → use it without intermittency

## Challenges in adoption

### Financial

- ① High cost of renewable power.
- ② High cost of technology (electrolysis on large scale).
- ③ limited capital subsidies compared to solar and wind.

### Technological

- ① low availability of technology, especially to MSMEs.

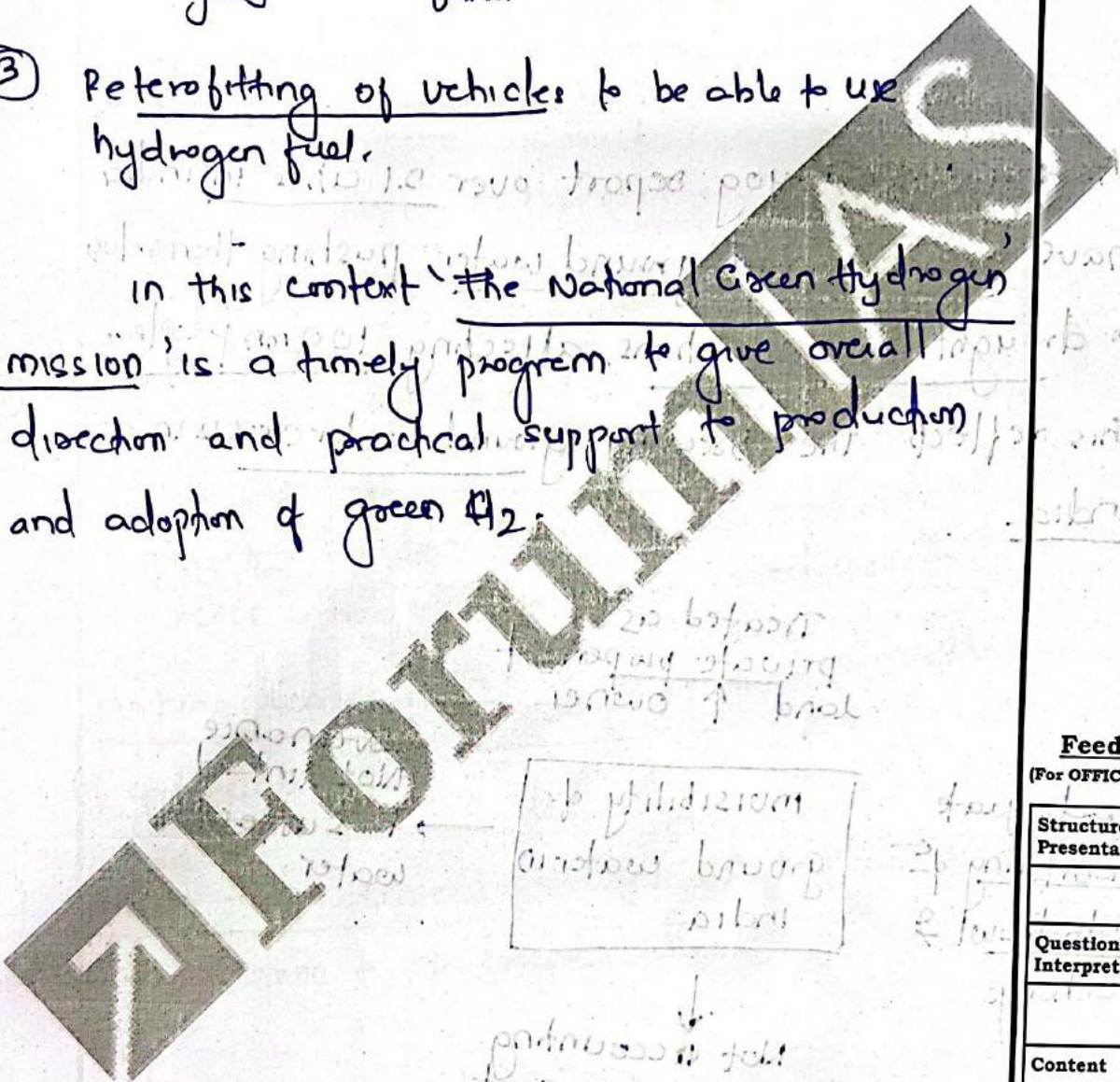
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② Cryogenic facilities for storage and transport

Hydrogen gas  $\rightarrow$  liquid form  $\rightarrow$  transport

③ Retrofitting of vehicles to be able to use hydrogen fuel.

In this context 'The National Green Hydrogen mission' is a timely program to give overall direction and practical support to production and adoption of green H<sub>2</sub>.



**Feedback**

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Question Interpretation
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Value Addition
Total

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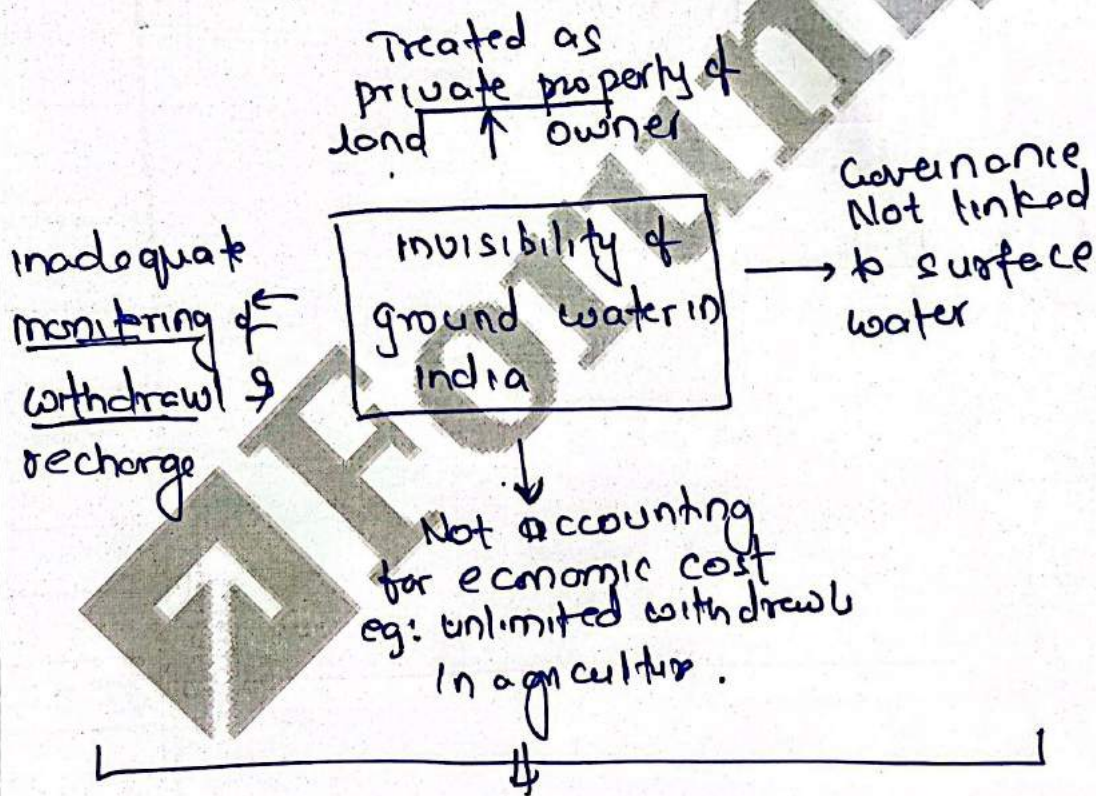
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Q.16) Making the invisible groundwater visible is critical for building climate resilience and achieving sustainable development goals, Examine. (15 marks, 250 words)

अदृश्य भूजल को दृश्यमान बनाना जलवायु को लचीलापन बनाने और सतत विकास लक्ष्यों को प्राप्त करने के लिए महत्वपूर्ण है। परीक्षण कीजिए। (15 अंक, 250 शब्द)

As per NITI aayog report over 21 states in India have overextracted groundwater pushing themselves to drought like conditions, affecting 100 mn people. This reflects the brewing groundwater crisis in India.



This invisibility resulted in

- over extraction
- no recharge
- no accountability

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## Visibility of ground water for climate resilience + sustainable development

- ① Recharge of ground water, to act as buffer against drought; eg: watershed management
- ② Adequate Rain water harvesting to check floods; eg: sponge cities in china
- ③ Agricultural productivity - through crop diversity  
eg: Punjab + Haryana - crop diversion - reduces excess ground water withdrawal - reduces salinity
- ④ Drinking water needs to be prioritised by auditing of ground water.
- ⑤ Women empowerment = because lack of groundwater forces women to go long distances for water
- ⑥ Tackles urban inequalities - eg: during Chennai Day zero crisis, slum dwellers disproportionately affected

Measures to make ground water visible

- watershed development in agriculture  
eg: Hware Bazar model
- people's participation via panchayats.
- Integrated governance of surface & ground water (Mishra Commission)
- water auditing of agriculture
- spread of micro irrigation for judicious use (PM KISAN Yojana).

It takes short time to deplete ground water but painfully long time to recharge. Thus its best to manage scientifically through participative schemes like Atal Bhujal Yojana

Feedback (For OFFICE use only)	
Structure/ Presentation	
Question Interpretation	
Content	
Value Addition	
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Q.17) Despite the presence of a strong institutional framework and clearly stated policy, huge losses in terms of human, financial, environmental and livelihood show that India still struggles in effective management of disasters. Discuss the reasons for the gap between policy and practices related to disaster management in the country. (15 marks, 250 words)

एक मजबूत संस्थागत ढांचे और स्पष्ट रूप से बताई गई नीति की उपस्थिति के बावजूद, मानव, वित्तीय, पर्यावरण और आजीविका के मामले में भारी नुकसान दर्शाता है कि भारत अभी भी आपदाओं के प्रभावी प्रबंधन में संघर्ष कर रहा है। देश में आपदा प्रबंधन से संबंधित नीति और उनके कार्यान्वयन के बीच अंतर के कारणों की चर्चा करें। (15 अंक, 250 शब्द)

A report by RBI highlighted that India suffered losses up to 6% of GDP due to disasters between 2000-2019.

Disaster management framework in place

- National disaster management act, 2005
- institutions - NDMA, SDMA, and district authorities
- National disaster management policy, 2016 - in line with Sendai framework
- NDMA guidelines for different disasters
- Response and mitigation funds with legal backing



Yet, there is a gap between policy and practise

- ① Top down approach causing inefficiency  
eg: Centre role in declaring disaster, fund mobilization
- ② Lack of community participation - eg: low attendance in mock drills, management plans
- ③ Local government not empowered to enforce guidelines  
eg: Rampant building code violation
- ④ Disaster management not mainstreamed into development  
eg: Earthquake resilient buildings in Delhi less than 5%.
- ⑤ Lack of multithreaded integrated approach.
- ⑥ Non-realisation of mitigation funds kept approach relief centric.

eg. Most states have no mitigation funds in place.

This requires a shift in approach in true spirit of Sendai framework

- ① Bottomup planning of risk management - eg: Dharmapuri cooperative in drought proofing the Dharmapuri village
- ② enforcing guidelines in a timely manner
- ③ clear annual target for minimising mortality et (as in Sendai framework)
- ④ creating cadre of disaster volunteers (Kerala Model)
- ⑤ Leveraging technologies for multi hazard management

.. The platform of coalition for disaster risk resilience led by India must be leveraged to mainstream disaster management int development for achieving SDGs

### Feedback

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Structure/ Presentation
Question Interpretation
Content
Value Addition
Total



Q.18) Present a brief account of various security forces deployed to protect India's terrestrial and maritime borders. Also, bring out various challenges faced by border security forces and suggest measures to effectively address them. (15 marks, 250 words)

भारत की स्थलीय और समुद्री सीमाओं की रक्षा के लिए तैनात विभिन्न सुरक्षा बलों का संक्षिप्त विवरण प्रस्तुत करें। साथ ही, सीमा सुरक्षा बलों के सामने आने वाली विभिन्न चुनौतियों को सामने लाएं और उन्हें प्रभावी ढंग से संबोधित करने के उपाय सुझाएं। (15 अंक, 250 शब्द)

India has a long border, 15000 km terrestrial and 7600 km coastal, both have been source of various security threats.

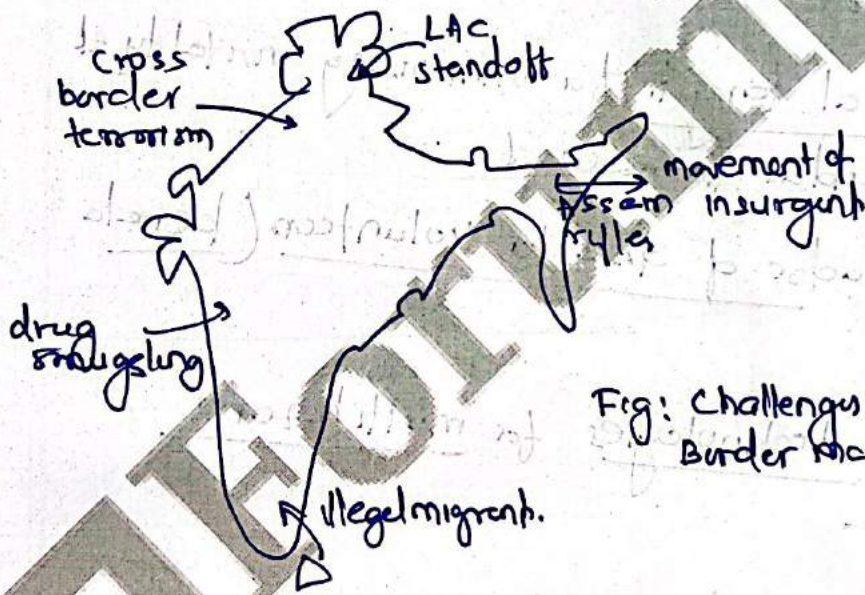


Fig: Challenges in Border Management

Security force	Area/domain of operation
① Border security force	Along India + Bangladesh Border

② Assam Ariles

Myanmar border guarding and insurgency in Northeast borders

③ Indo-tibetan Border police (ITBP)

Alepaal and Bhutan border

④ Sastriye Seema Bal

Indo-china border - Line of actual control

⑤ Coast guard and navy

coastal waters, territorial and EEZ respectively

⑥ Army and Indian air force

combined conventional threat on border

⑦ state police

tackling law and order in border areas

Various challenges forced by border security forces

→ porous borders due to disputes and geography

→ difficult terrain to operate  
eg: cracken glacier -50°C

→ inadequate infrastructure and equipment

→ Personnel shortage  
eg: Quitting in CAPF

→ lack of coordination between different forces  
 eg: coastguard → police  
 → low pay and pension issues  
 eg: one rank one pension issue.

**Measures to address them**

- ① Technology aid for effective management  
 For eg: CIBMIS, BOLD-DIT along borders
- ② Investing in modern equipment - eg: heat surf.
- ③ Integrated theatre commands (ITC) to bring coordination
- ④ Resolution of border disputes eg: LAC demarcation
- ⑤ improving pay and <sup>work</sup> living conditions - eg: 100 days leave promise for CAPF

In an uncertain world, a country with long border and numerous border threats needs a robust and prepared border security forces.

**Feedback**  
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Structure/ Presentation
Question Interpretation
Content
Value Addition
Total

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 Q20) In what ways management of maritime borders differ from that of territorial borders? Also, analyze various vulnerabilities that arise from a large maritime boundary of the country.

(15 marks, 250 words)

समुद्री सीमाओं का प्रबंधन किस प्रकार क्षेत्रीय सीमाओं से भिन्न है? इसके अलावा, देश की लंबी समुद्री सीमा से उत्पन्न होने वाली विभिन्न सुभेदताओं का विश्लेषण करें।  
 (15 अंक, 250 शब्द)

India has a long border, with 7600 km maritime border and 15000 km territorial border, demanding different management.

## Border management

Maritime border	Territorial border
<p>① No border disputes. majors</p> <p>② sub conventional threat eg: Organised crime</p> <p>③ Managed by coast guard and Navy</p>	<p>Managing highly disputed border eg: LAC - china LoC - Pakistan</p> <p>conventional and sub-conventional eg: 1962 India-china LoC</p> <p>A number of forces - (one border one force) eg: Mynmer - Assam rifle.</p>

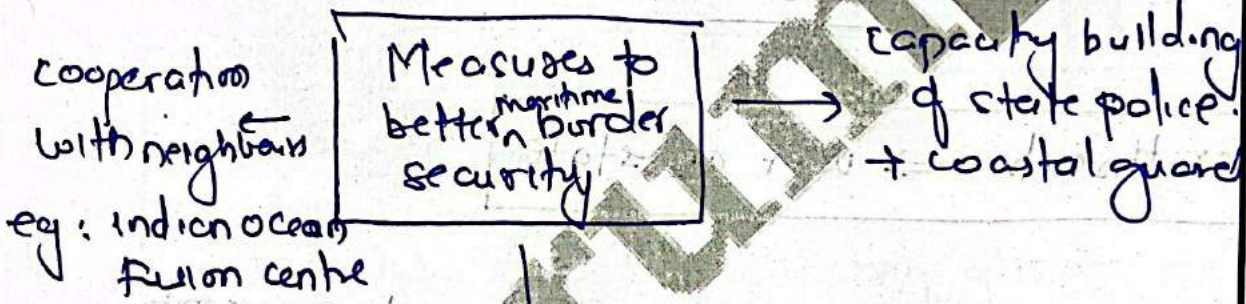
vulnerabilities  
from a long  
maritime border

- Scope for infiltration  
eg: 2008 Mumbai attack  
terrorists entered from coast
- Guarding against large  
Exclusive Economic zone
- Countering assertion in  
Indo-pacific water  
eg- China's string of pearls
- High disaster vulnerability  
70% of India's coast cyclone  
prone
- organised crimes - Money  
laundering, drug trafficking  
eg: 3000kg Heroin seized at  
Mundra port recently

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→ fragmentation of military resources between land and maritime threat  
 → Need to collaborate with neighbours eg. SAGAR

Integrated theatre commands for optimization



India plans on leveraging 'Blue economy' to achieve sustainable development goals. This requires robust coastal maritime border management

**Feedback**  
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Structure/Presentation	
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Q.20) Cyberthreats can wage a dual war on the state and citizens, disrupting the national security as well as social stability. Explain. (15 marks, 250 words)

साइबर धमकी राज्य और नागरिकों पर दोहरा युद्ध छेड़ सकती है, जिससे राष्ट्रीय सुरक्षा और सामाजिक स्थिरता बाधित हो सकती है। व्याख्या कीजिए। (15 अंक, 250 शब्द)

NCA data shows that cyber threats are increasing rapidly. Cyber crimes registered 65% increase between 2018 and 2019.

Cyber threat  $\Rightarrow$  war on state

- ① Cyber terrorism attacking the state sovereignty  
eg: stuxnet attack on Iran.
- ② Attack on critical infrastructure destabilising society  
eg: Attack on Mumbai power grid (2020-21)
- ③ Cyber radicalization disrupting social order  
eg. Youth from Kerala joining ISIS
- ④ Attack on military installations  
eg. Recent drone attack on IAF grounds

Cyber threat  $\Rightarrow$  war on individual

- ① Cyber extortion as seen in ransomware attacks
- ② Identity frauds damaging reputation
- ③ Data stealing and crimes eg: Jamtara bank details scam
- ④ Abuse and trolling - eg: Bull Bai + Cullideals case of abuse of muslim women
- ⑤ spread of fake news manipulating opinions + choices  
eg: August 2020 Bengal riot following fake communal news

This serious threat to social stability + national security requires a multi-pronged response

Measures needed

- A comprehensive law & doctrine of cyber security
- coordination between agencies spread across ministries  
eg: CERT.in, NCC etc
- Awareness generation eg: cyber hygiene sensitization
- Involving private sector & civil society  
eg: zero trust based environment
- Self reliance in electronics sector

In this regard, the Cyberdome project of Icerata which combines top down & bottom approach is a practical way to assess and manage cyber vulnerabilities

Feedback (For OFFICE use only)

Structure/ Presentation
Question Interpretation
Content
Value Addition
Total