

TEST CODE 6 1 3 2 0 2

FIAS – MGP 2023 – Cohort 13 – Sectional Test #6

Time Allowed : Three Hours
समय : तीन घंटे

ForumIAS

Maximum Marks : 250
अधिकतम अंक : 250

GENERAL STUDIES / सामान्य अध्ययन

Name Of Candidate परीक्षार्थी का नाम	HARNIT SINGH SODAN		
Roll No./अनुक्रमांक	1910103573	Medium/माध्यम	English <input checked="" type="checkbox"/> हिंदी <input type="checkbox"/>
Center Code/परीक्षा केंद्र		Date/दिनांक	24-08-23

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INDEX TABLE / अनुक्रमणिका			INSTRUCTION / अनुदेश	
Q. No. प्र.सं.	Max. Marks अधिकतम अंक	Marks Obtained प्राप्तिक	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।	
1			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।	
2			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।	
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. 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।	
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. 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 : 8:15	End Time/समाप्त करने का समय : 11:15
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 आकड़ों या समग्र रूप किसी अन्य विषय वस्तु जो मूल्यांकन कर्ता को आपकी कॉपी में पसंद आयी 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 :
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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.

EXAMINER'S REMARKS

CRITERIA FOR THE FEEDBACK SECTION AT THE END OF EACH QUESTION

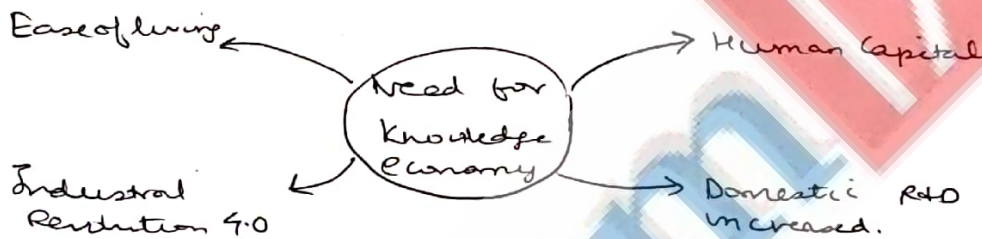
1. **AWIS = Answered What is Asked.** This means whether you have addressed the core demand of the question or not. Addressing the core demand of the question gets you an objectively fair score. It is examiner's perception if you have understood the question and if you know the answer in the first place. 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.



Q.1) The STEM (Science, Technology, Engineering and Mathematics) sector provides opportunities for India to become a leader in knowledge economy; however, there is a need to democratise its access in order to harness its complete potential. Analyse. (10 marks, 150 words)

STEM (विज्ञान, प्रौद्योगिकी, इंजीनियरिंग और गणित) क्षेत्र भारत को ज्ञान अर्थव्यवस्था में अग्रणी बनने के अवसर प्रदान करता है; हालांकि, इसकी पूरी क्षमता का उपयोग करने के लिए इसकी पहुंच का लोकतंत्रीकरण करने की आवश्यकता है। विश्लेषण करें। (10 अंक, 150 शब्द)

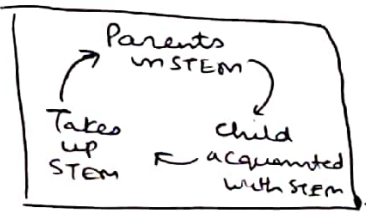
A Knowledge economy refers to utilisation of Intellectual Capital in the systems of production & consumption. It is driven by scientific discoveries and research.



STEM Sector & knowledge economy :-

1. IPR: High quality research provides IPR → boost to knowledge economy. @ India's 4 cond vaccines

2. Promotes Scientific Culture :-



3. Applied Aspect :- All STEM research is better applied @ Nuclear Science → leads to Brachytherapy

4. Generate International collaborations @ Indo-US collab

iCET initiative.

Need to democratise :-

1. Gender Biased :- Women
 → 42% undergrads
 → 14% employed in STEM.
2. Urban Bias :- Centred in urban areas of Country
 (eg) IIT-Delhi - Hauz Khas Area.
3. Inclusivity :- Disabled friendly infrastructure yet to come.
4. Cost barrier :- 1 semester = ₹1.5 lakh average ⇒ unaffordable.
5. Poor Universities Capacity + Specially → State Universities starved of funds ⇒ UGC favours Central university.



Hence, an inclusive stem culture in india can fulfill vision of knowledge economy and Jai-Anusandhan

Feedback
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#	C	A	P
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CD & VA			
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Please put tick marks in the above table. Here G is Good, A is Average and P is Poor.			
TOTAL MARKS			

Q.2) Defense indigenization remains the Achilles heel of India's security architecture. Examine the importance of startups in defense sector to make India secure and self-reliant.

(10 marks, 150 words)

रक्षा स्वदेशीकरण भारत की सुरक्षा संरचना का आधार बना हुआ है। भारत को सुरक्षित और आत्मनिर्भर बनाने के लिए रक्षा क्षेत्र में स्टार्टअप के महत्व का परीक्षण कीजिए।

(10 अंक, 150 शब्द)

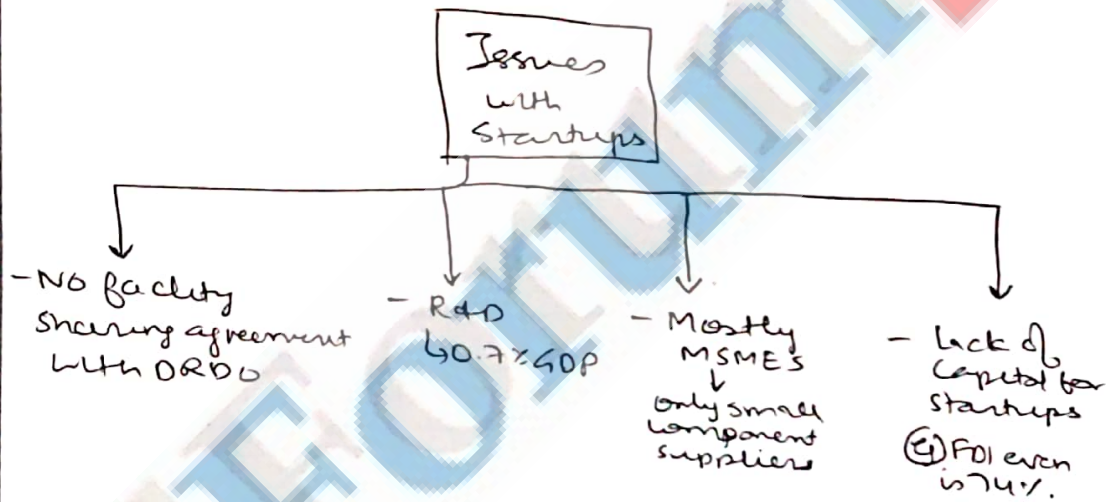
A Defence is a strategic sector of the country and it must not have external dependence. However SIPRI Report deems India as 2nd highest importer of arms in the world.



Importance of Startups :-

1. Reduce foreign dependence :- At present 80% of India's defence equipment is imported.
 - 45% Russia
 - 28% France
 - 16% USA.
2. Provide new Horizons + tech :- @ DRDO Startups
Collab → Corner shot weapon for army.
3. Better maintenance @ Avoid Russian delays in maintenance of MiG planes.

4. Promote domestic manufacturing :- FY 22 - India 1st time crosses ₹1 lakh crore domestic manufacturing.
5. Cost effectiveness :- economical labour & available human resource ⇒ Indian Speciality.
6. Promotes Joint Ventures (eg) C-295 airplane being fully made in India first time



However government is taking steps to promote Startups like iDex, Aero India show, Positive and negative indigenisation lists to ensure Atmanirbhar indigenice and reach exports of ₹ 35000 crore by 2025.

Feedback

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Please put tick marks in the above table. Here G is Good, A is Average and P is Poor.			
TOTAL MARKS			



Q.3) DPI (Digital Public Infrastructure) is indispensable for digitally enabling citizens and businesses; however, the challenges of exclusion, exploitation, and monopolisation cannot be ignored. Examine. (10 marks, 150 words)

DPI (डिजिटल पब्लिक इंफ्रास्ट्रक्चर) नागरिकों और व्यवसायों को डिजिटल रूप से सक्षम करने के लिए अपरिहार्य है; हालाँकि, बहिष्कार, शोषण और एकाधिकार की चुनौतियों को नजरअंदाज नहीं किया जा सकता है। परीक्षण कीजिए। (10 अंक, 150 शब्द)

A India has emerged as leader in DPI, with interventions like CowIN, Aarogya setu & JAM trinity.

DPI for enabling citizens

1. Promote ease of access @ De-locked for documents.
2. Enable transparency & accountability @ e-RTI.
3. Promote Social Justice @ Farmer welfare by e-NAM system.
4. Better Quality services @ ABDM for digital health care

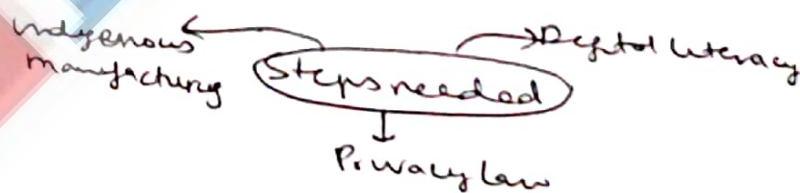
DPI for businesses

1. EODB promotion @ MCA 3.0 website for engagement

2. Level playing field @ DNDC for local businesses
3. Facilitate business processes @ UPI use for business payments (like Kirana Shops)
4. Promote Joint venture @ Companies establish in GIFT city because of good DPI.

Challenges

1. Monopolisation @ Flipkart, Amazon duopoly in e-commerce in India.
2. Exclusion :- @ Urban-rural digital divide @ women-men access difference of 26%.
3. Exploitation - cyber frauds, privacy issues and data leaks.



Government of India is bringing Digital India Act to handle all the concerns and ensure Inclusive Development of Digital Naxos.

Feedback

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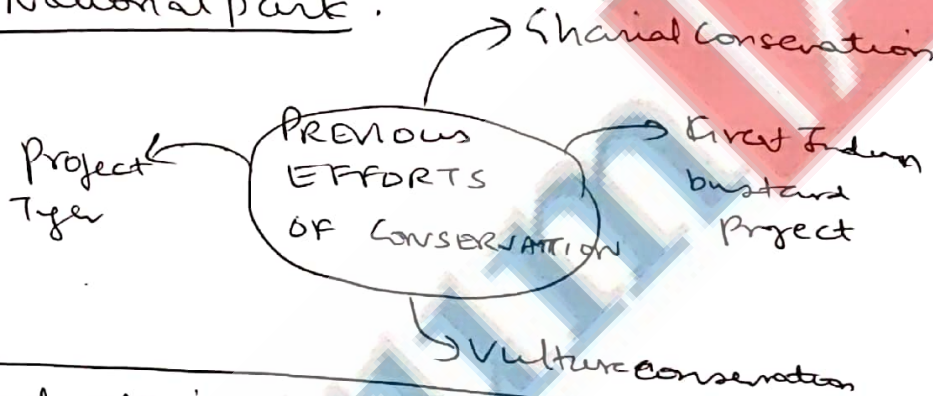
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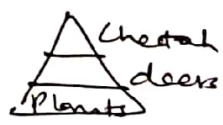
Q.4) Project cheetah marks a departure from India's efforts for conservation of various critically-endangered species. In this perspective, do you think the reintroduction of major fauna that has gone extinct is justified? (10 marks, 150 words)

प्रोजेक्ट चीता विभिन्न गंभीर रूप से लुप्तप्राय प्रजातियों के संरक्षण के लिए भारत के प्रयासों से विचलन का प्रतीक है। इस परिप्रेक्ष्य में, क्या आपको लगता है कि विलुप्त हो चुके प्रमुख जीवों का पुनरुद्धार उचित है? (10 अंक, 150 शब्द)

India has brought 20 cheetahs from Namibia & South Africa for its reintroduction in the Kuno National park.



Reintroduction is justified

1. Ecosystem restoration:- Cheetah was present in India till 1952 → Ecosystem balance will be restored.
2. Modulate population of prey → Apex predator role will be fulfilled. 
3. Shows progressive approach → going beyond living species & trying to restore extinct Species

4. Can generate employment → local guides and villages → employed for local tourism (eco-safaris etc)

Issues in such project

1. High Risk :- At present 9 cheetahs have died → not a good image
2. Other species need protection @ Kuno was prepared for lion → never done
3. Genetic pool → the african cheetah is not adapted to condition of asiatic cheetah.
4. Man-Animal conflict :- such projects can create further issues for local.

Hence there is need of long term study before such projects are taken up to ensure proauring commitment to CITES and Wildlife protection Act 1972

Feedback

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Please put tick marks in the above table. Here G is Good, A is Average and P is Poor.			
TOTAL MARKS			

Q.5) What do you understand from Green growth? With special reference to the budget 2023-2024, discuss various government measures to propel green growth in the country.

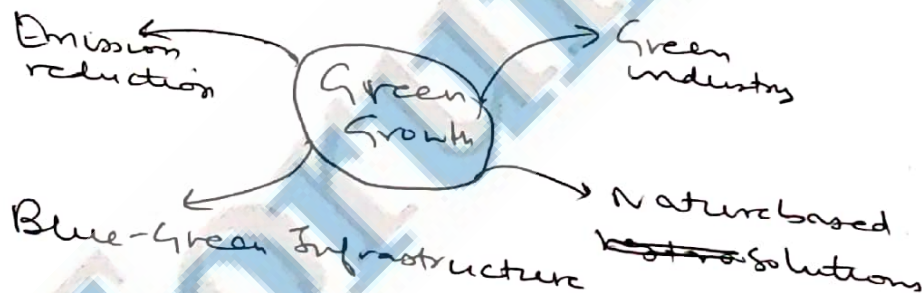
(10 marks, 150 words)

हरित विकास से आप क्या समझते हैं? बजट 2023-2024 के विशेष संदर्भ में, देश में हरित विकास को बढ़ावा देने के लिए विभिन्न सरकारी उपायों का आकलन कीजिए।

(10 अंक, 150 शब्द)

A Green Growth Refers to low carbon intensity growth route, that creates a win-win situation for people & environment.

India's 8th Rank in Climate Change performance index is the proof ~~of~~ of this.



Government Measures for Green growth.

1. Budget 23-24

(a) MISHTI program - restoring coastline mangrove

(b) Amrit Dhanha :- wetland restoration drive.

c) ₹35000 Cr funding for green pathway of energy development.

d) Subsidies on lithium battery imports.

e) 10GW Geothermal / solar power project in Ladakh

f) Green Credit Subsidy project in budget

2. Policies

- └ Offshore wind policy 2018
- └ Solar-wind hybrid policy 2018

3. Schemes

- └ Green H₂ mission - 10000 crore for make India a global hub
- └ Ethanol blending - 20% by 2025

4. International

- └ launch of ISA :- OSOWOG
- └ Global biofuel Alliance → international collaboration.

India needs \$15tn for its transition to NRE by 2070, hence such schemes need to continue in spirit of Panchamrit of COP26

Feedback

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TOTAL MARKS			

Q.6) Unplanned urbanization has made Indian cities vulnerable to fire safety hazards. Discuss and recommend measures for mitigating urban fires, with special reference to national building code, 2016. (10 marks, 150 words)

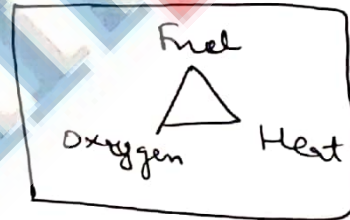
अनियोजित शहरीकरण ने भारतीय शहरों को अग्नि सुरक्षा खतरों के प्रति संवेदनशील बना दिया है। राष्ट्रीय भवन संहिता, 2016 के विशेष संदर्भ में, शहरी अग्नि को कम करने के उपायों पर चर्चा करें और सुझाव दीजिए। (10 अंक, 150 शब्द)

A The recent fires in Delhi Kanak Mandi and Raynder Nagar Coaching institute fire, tell us the message of urban fires in unplanned urbanisation.

Reasons of fires :- Unplanned

urbanisation has led to

1. poor space management → cramped areas, poor ventilation → fire hazard.
2. Weak enforcement :- ULB → less resources for monitoring all new construction.
3. Unskilled labourforce → can't implement fire safety protocols.
4. Lack of training → techniques like "wet towel" method to avoid CO₂.



5. Shortage of fire suppressant material in buildings @ no sand, no CO₂ based extinguisher.

Measures needed :- National building code 2016 recommends:-

- ① Based on heat generated → ventilation
→ height of ceilings
→ size of water sprinklers.
- ② Radon based lighting in emergency exit routes.
- ③ Inspection procedures and proper earthing of equipment → avoid short circuits.

Other measures

- ① Fire Fighting groups to be 24x7 ready-
- ② Training, Awareness and Capacity buildups.

Urban India is set to be 50% of population by 2050 (NITI Aayog), hence fire hazard must be neutralized in spirit of Sendai.

Feedback

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TOTAL MARKS			

Q.7) Edge in modern warfare lies not so much in the capacity to overwhelm the adversary as much in the ability to nip the threat in the bud. In this context, discuss the role of intelligence in maintaining national security, and also cite challenges associated. (10 marks, 150 words)

आधुनिक युद्ध में बढ़त प्रतिद्वंद्वी पर हावी होने की क्षमता में उतनी नहीं है जितनी कि खतरे को शुरुआत में ही खत्म करने की क्षमता में है। इस संदर्भ में, राष्ट्रीय सुरक्षा को बनाए रखने में खुफिया जानकारी की भूमिका पर चर्चा कीजिए और इससे जुड़ी चुनौतियों का भी उल्लेख कीजिए। (10 अंक, 150 शब्द)

A Role of intelligence is highlighted in the quote that " Battles are not fought in fields, but in minds of steel", the ability to predict enemy moves and intensity of attacks determines victory & success.

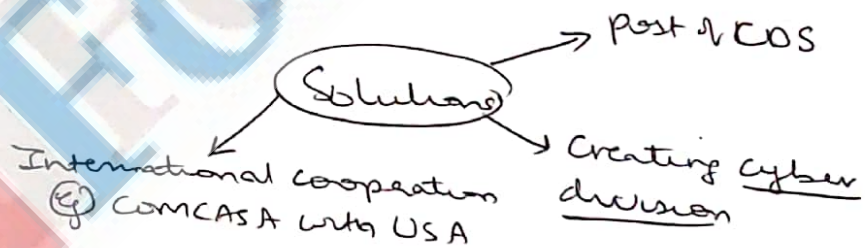
Role of intelligence in National Security

1. Helps avoid escalation @ Failure of intelligence in 1962 war.
2. Address the problem when it is small @ NIA operation DIVAT → mass arrests of gangsters and criminals.
3. Helps in planning @ poor intelligence of Russia in Ukraine war → poorly planned @ tanks running out of fuel midway.

d) increases deterrence :- @ the fear of RA & AW in Pakistani ISI.

Challenges in India

1. Subsided approach :- Multiple agencies @ CBI, NIA, RAW, NSA etc.
2. Poor cyber intelligence @ Craa police has no cyber wing.
3. Lack of coordination among 3 forces - Army, Navy, Airforce in intelligence gathering
4. Lack of unified framework → no intelligence doctrine present.



Intelligence can be winning factor for India in a hostile neighbour hood of geopolitical uncertainty, for ensuring peace & security in the region

Feedback
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TOTAL MARKS			



Q.8) Highlighting different kinds of cyberthreats faced by India, evaluate the current status of cybersecurity framework in the country. (10 marks, 150 words)

भारत द्वारा सामना किए जाने वाले विभिन्न प्रकार के साइबर खतरों पर प्रकाश डालते हुए, देश में साइबर सुरक्षा ढांचे की वर्तमान स्थिति का मूल्यांकन करें। (10 अंक, 150 शब्द)

India has faced 3700 cyber attacks per day in 2022 as per LERT-INS, highlighting the vulnerability of India.

Cyber threats faced by India

- ① Malware @ AIIMS 2022 data breach by Malware
- ② Subotage Attacks @ Attack on Maharashtra public ^{electricity} corporation in 2021.
- ③ Hacking @ IIIT-Ropar 2020 website hacking
- ④ Data Breaches @ COWIN+ Adhar data breaches 2022.
- ⑤ Cyber Frauds @ Phishing & Spambased frauds.

STATUS OF CYBERSECURITY

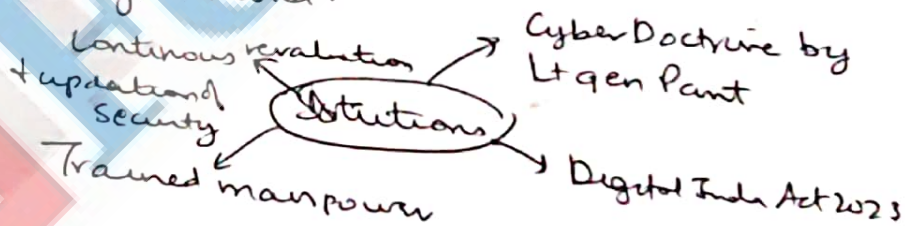
- ① Laws :- ① IT Act 2000 is in place
 ② DPDP Act 2023 recently passed.

- ② Bodies :- ① CERT-in → nodal body
 ② I4C → Under MHA → surveillance
 ③ CSK → bots removal.

- ③ Operational framework ① NATSRID ② CCTNS ③ MAC

Issues in present system

- Cooperation :- 36 bodies are involved in cyber security.
- Ineffective laws :- IT Act 2000 is outdated for cyber security.
- Hardware vulnerability → Impact dependence
- Critical Infrastructure → not designed with cyber security in mind.



Only, a 360° approach can create a Cyber defence & ensure a Safe & secure Digital Bharat of 2023.

Feedback

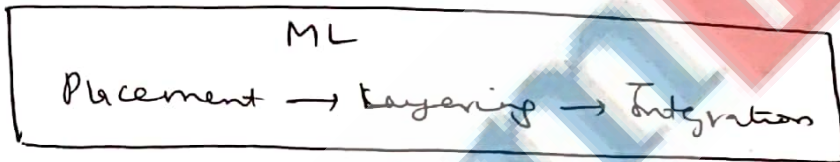
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Please put tick marks in the above table. Here G is Good, A is Average and P is Poor.			
TOTAL MARKS			

Q.9) Money laundering is a global problem that cannot be solved by isolated responses. Discuss the statement and also suggest ways to curb the menace. (10 marks, 150 words)

मनी लॉन्ड्रिंग एक वैश्विक समस्या है जिसे विभाजित प्रतिक्रियाओं से हल नहीं किया जा सकता है। कथन पर चर्चा करें और खतरे को रोकने के तरीके भी सुझाएं। (10 अंक, 150 शब्द)

The NIA recently arrests members of PII in connection with ISIS and money laundering, thus proving that ML is a global problem & can't be solved by isolated responses.

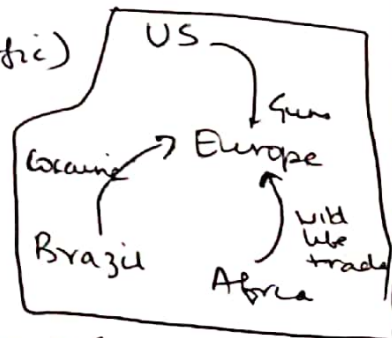


ML is a global problem.

1. Existence of branches of non state organisations



2. Organised crime networks
 are transnational



3. Money laundering works on creating long trails that are untraceable → multiple countries jumped

Isolated steps don't help

1. Address the symptom not the cause ⊕ Arresting NSCN members in NE → not stop illegal drug trafficking in Golden triangle.
2. Organised Crime - Terror - ML linkage :- This nexus needs to be broken → not see them in isolation.

Ways to curb

1. National laws - stringent laws like PMCA, FERA, FCRA are needed in all countries for ML.
2. Specialised bodies like ED, FIU-IND, are effective for ML.
3. International collaboration ⊕ Signing the Palermo convention of UN.

India has taken the first step by collaborating with FATF, APG and hosting No-money for terror conference, to help stifle ML, "That acts as oxygen to illegal activities"

Feedback
(For OFFICE use only)

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Q.10) Assess the relevance of the NISAR mission in observing and managing climate change and natural hazards. (10 marks, 150 words)

जलवायु परिवर्तन और प्राकृतिक खतरों के अवलोकन और प्रबंधन में NISAR मिशन की प्रासंगिकता का आकलन कीजिए। (10 अंक, 150 शब्द)

NISAR is the world largest aperture

Observation Satellite, scheduled to be launched

soon, developed by NASA & ISRO together.

NISAR Contributions	
<u>NASA</u>	<u>ISRO</u>
• X-band	S-band
• Solid state storage system	Launch vehicle

Relevance

1. For climate change :-

- Best quality images generation → High resolution cameras
- Faster monitoring → Cover whole earth in 12 days (very fast)
- Data Generation for studies in various fields

like oceanography, climatology etc.

2. Natural Hazards:-

- a) 24x7 coverage - NISAR can look through clouds.
- b) Data Quantification:- Onboard systems can process data → merge multiple images and send the combined image.
- c) Global system - Core Hazards in multiple countries.
- d) Can inspire future such collaborative efforts towards hazard monitoring in different countries.

Hence, NISAR will be a technological marvel for India & world, fulfilling the vision of India's space adventures as would have been envisioned by Dr. Sarabai.

Feedback

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Q.11) Though often presented as a panacea to the dichotomy between development and ecological conservation, nuclear technology has multitude of other uses. Briefly explaining India's three stage nuclear program, throw light upon various applications and challenges associated with nuclear technology in the country. (15 marks, 250 words)

हालांकि अक्सर विकास और पारिस्थितिक संरक्षण के बीच द्विभाजन के लिए परमाणु प्रौद्योगिकी को रामबाण के रूप में प्रस्तुत किया जाता है परंतु इसके कई अन्य उपयोग भी हैं। भारत के तीन चरणों वाले परमाणु कार्यक्रम की संक्षेप में व्याख्या करते हुए, देश में परमाणु प्रौद्योगिकी से जुड़े विभिन्न अनुप्रयोगों और चुनौतियों पर प्रकाश डालिए। (15 अंक 250 शब्द)

A Government of India has recently approved 10 new nuclear power plants, to take ^{nuclear power generation} from 6 GW to 22 GW by 2030, thus promoting development & protecting ecology.

India's 3 stage Nuclear power plant

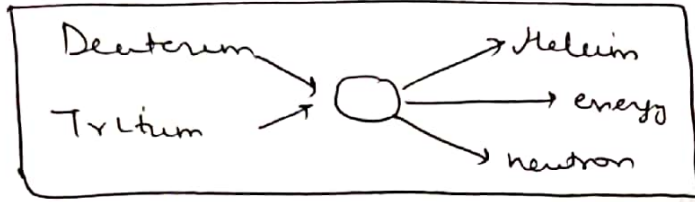
It was formulated by Homi Jahangir Bhabha

Stage	Fuel	Transmutates	Reactor
I	Uranium 235	a) Uranium 238 → Plutonium 239	PHWR/BWR
II	Plutonium 239	a) U-238 → Pu 239 b) Uranium 233 ← Thorium 232	FBR
III	Uranium 233 Thorium	a) Thorium 232 → Uranium 233	Advanced

It is based on a hierarchy of fuels (U 235, Pu 239, U-233) and utilizes abundant thorium in the Indian coast.

Applications of Nuclear Technology

1. Fusion technology → @ ITER Reactor → Tokamak.



2. Medical application

a) Diagnostic → @ Tomography.

b) Treatments → Cancer Therapy
→ Brachytherapy.

3. Food & Agricultural

a) Cleansing food → irradiation technology

b) Fertilisers → P^{32} , K^{40} fertilisers.

c) New crops → inducing mutation
by radiation

4. Industrial application → tracers in pipelines

→ sensors @ Americium
 241 → smoke detector

5. Consumer Application → @ Glowing watches → Radon

Challenges :-

1. Dual use technology → Nuclear proliferation risk
 ⊕ ^{North} Korean nuclear missiles
2. Health Risks ⊕ Marie Curie died of radiation exposure.
3. Import dependency ⊕ Australia, Kazak supply uranium to India.
4. Nuclear power → needs huge amounts of water for cooling
 → huge costs of plants.
 → costlier electricity vs Solar.
 → CLINDA :- Nuclear liability act does not allow foreign investment.

Government is taking cautious steps, and is favouring Small Modular Reactors (SMR, Atm) for promotion of electricity generation in the country for SDG-7

Feedback

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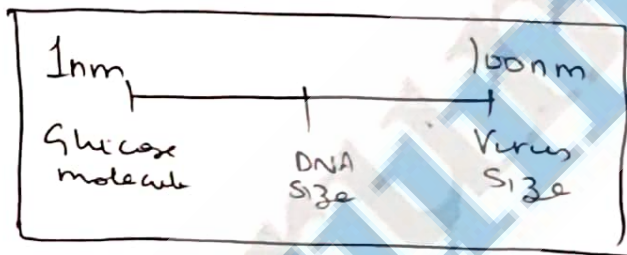
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Q.12) What do you understand by nanotechnology? In what ways can nano-technology aid in socio-economic growth of the country? (15 marks, 250 words)

नैनो टेक्नोलॉजी से आप क्या समझते हैं? नैनो-प्रौद्योगिकी देश के सामाजिक-आर्थिक विकास में किस प्रकार सहायता कर सकती है? (15 अंक, 250 शब्द)

A Nanotechnology refers to a scale of application of 1-100 nanometers where molecules and atoms have different properties vis-a-vis their macro molecular counterparts. @ Gold at nanoscale → yellow
→ green
→ red



Nano & Socio-economic growth :-

1. Agricultural Applications → better yields, better production + better income @ Nano Urea, and Nano DAP launched → less qty used → better yields
2. Health Applications:- improve surgeries and reduce side effects @ Nanobots based

Surgery, nanomicelles based targetted drug delivery.

3. Clean energy Applications :- can significant impact goals of NZE-2070.

eg) Selenium nanomolecules in Solar cells → inc efficiency

eg) Graphene Carbon Nano tubes → Storage and transportation of Hydrogen.

4. Environmental Applications :- promote clean environment.

eg) Fe-nanomolecules → purify water.

5. Getting Industry Applications eg) Silver-nanoparticles → bactericidal.

6. Pure Research :- India has 77 startups in Nanotech, and 23000 research papers published.

Issues with Nanotech :-

1. Nano-pollution :- environmental release → unable to contain
2. Nano-toxicity :- human health effects
Concerns by US-FOA.
3. Dual use technology :- It has military proliferation capacity.
4. Spying :- Nanosensors can be embedded → privacy violation.
5. Cost Access + At current stages → very costly → poor equity

Government has recently established Graphene innovation centre in Thrisur to aid the development in nanotechnology, as Dr. C.N.R. Rao would have wanted for India @ 2017.

Feedback

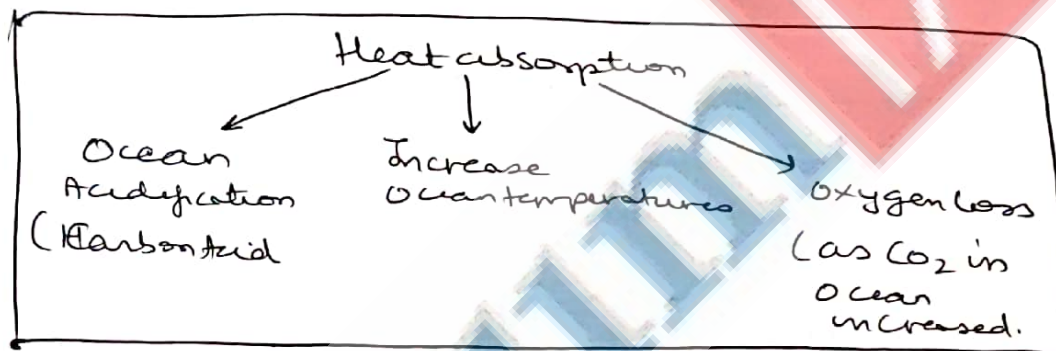
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Q.13) Warming ocean temperatures, oxygen loss and ocean acidification form a deadly trio for marine ecosystem that can have irreversible repercussions for environment as well as economy. Elucidate. (15 marks, 250 words)

समुद्र का गर्म होना, ऑक्सीजन की कमी और समुद्र का अम्लीकरण समुद्री पारिस्थितिकी तंत्र के लिए एक घातक तिकड़ी है जो पर्यावरण के साथ-साथ अर्थव्यवस्था के लिए अपरिवर्तनीय प्रभाव डाल सकती है। स्पष्ट करें। (15 अंक, 250 शब्द)

A Oceans at present are absorbing 50% of excess heat generated in the ecosystem, leading to the formation of deadly trio.



Deadly trio and impact on ecosystem.

1. Warming ocean temperatures → increased extreme events @ Cyclone Diksuru china
2. Oxygen loss → mass dying @ Dead whales on the shores of Australia.
3. Ocean Acidification → loss of Calcareous

Animals @ Dissolution of Great Barrier Reef.

Impact on Economy

1. Loss of life and infrastructure @ Cyclone Amphan alone costed India \$13bn.
2. Ruin of blue economy → India 2.mn sq km EEZ → 1.2% GDP → In danger.
 - ① Fall in exports of fisheries, and aquaculture.
3. Fall of Ecosystem services @ at present \$33 trillion of services provided by nature → will have to be done by us in future.
4. Diversion of expenditure towards disaster management from development @ loss of corals as bio shields against cyclones.
5. Mass Resplacement of Migration → Social

Conflict, suffering education & health status.

Steps required to be taken

Short term :-

1. Shifting to Greentechnologies → Renewable energy → ~~Red~~ + Carbon Capture.
2. Adaptation plans (e.g) Stilt houses in coastal areas. to avoid sea level rise.
3. Disaster preparedness (e.g) SDRF alert.

Long term measures

1. Reduce GHG emissions in spirit Paris deal of 1.5°C goal.
2. Ecosystem restoration (e.g) Bioreak method for coral restoration

Only with a long term focus we can promote SDG-13, SDG-14, while ensuring sustainable development and building a greener economy

Feedback

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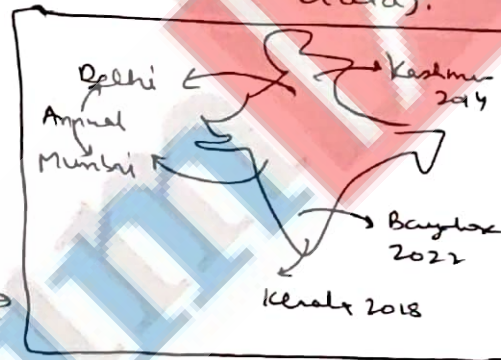


Q.14) Examine the factors that heightens the vulnerability of Indian cities to urban floods. In light of National Disaster Management Authority (NDMA) guidelines on urban floods, discuss suitable mitigation and management strategy. (15 marks, 250 words)

उन कारकों का परीक्षण कीजिए जो शहरी बाढ़ के प्रति भारतीय शहरों की सुभेद्यता को बढ़ाते हैं। शहरी बाढ़ पर राष्ट्रीय आपदा प्रबंधन प्राधिकरण (NDMA) के दिशा-निर्देशों के आलोक में, उपयुक्त शमन और प्रबंधन रणनीति पर चर्चा करें। (15 अंक, 250 शब्द)

A Urban floods have become a new reality of India, with 6 times faster buildup, 3 times more peak water levels. (MoHUA data).

Factors Heightening
Vulnerability



1. Unplanned Urbanisation →

NITI Aayog → by 2030 → 50%

India will be urban → urban proliferation.

Recent urban
Floods

2. Concrete Jungles → loss of tree cover and wetlands that help mitigate excess water, combined with Urban Heat Island effect.

3. ULB poor capacity :- only 44% own funds generation → poor ability to manage such events.

4. Poor Management → no regular desiltation

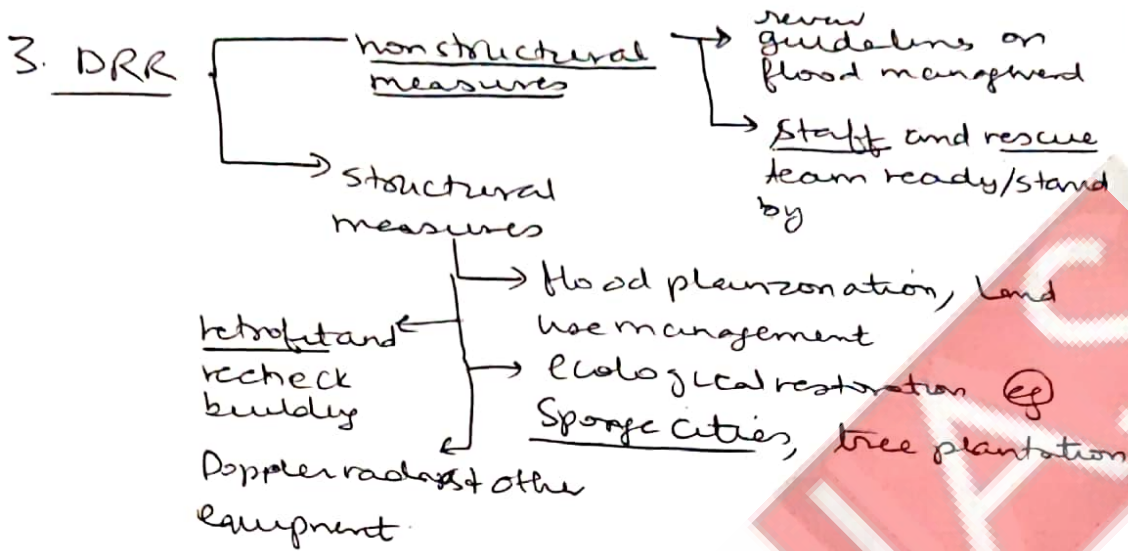
of drains, use of stormwater drains for
sewage.

5. Climate change → extreme weather events
increasing @ Chennai 2019 floods.
6. Plastic Menace : Overuse → 26000 tonnes
per day generated → clogs drains
7. Lack of DRR in planning @ Buildings are
not made for flood resilience → not following
of building codes.

Mitigation & Management :- NEMA has provided
2019 plan that has given multistep plan for
Urban flooding.

Mitigation Measures

1. Risk Assessment → Climatic & non climatic
risks, terrain maps to be generated.
2. Vulnerability Assessment :- considering gender,
demography, poverty levels. @ Separate
management for slum areas



Management Measures

1. EWS & Monitoring @ NDMAs incident reporting system (IRS).
2. Awareness generation & Capacity buildly!
Mock drills, escape plans etc
3. Response → Ambulances, airlift, social media use @ Facebook - Mark yourself safe

With a 360 approach, in the spirit of Sendai, we need Post-Disaster Needs Assessment for management of urban floods and achieve SDG-9.

Feedback

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Q.15) Though Naxalism is showing a downward trend, it is not only thriving in its core areas of influence but also changing its form. Analysing the reason for its retreat, underline the factors behind its continuance. Also, discuss measures towards eliminating LWE from the country altogether. (15 marks, 250 words)

हालांकि नक्सलवाद में गिरावट की प्रवृत्ति दिख रही है, लेकिन यह न केवल अपने प्रभाव के मूल क्षेत्रों में फल-फूल रहा है बल्कि अपना रूप भी बदल रहा है। इसके पीछे हटने के कारणों का विश्लेषण करते हुए, इसके जारी रहने के पीछे के कारकों को रेखांकित करें। साथ ही देश से वामपंथी उग्रवाद को पूरी तरह खत्म करने के उपायों पर भी चर्चा करें। (15 अंक, 250 शब्द)

A As per ministry of Home Affairs, incidence of Naxalism has come down from 2000 in 2014, to 500 in 2022, and affected districts from 36 to 46 in last 8 years. However, the recent attacks in Dantewada (April 2023), and the risk of urban Naxalism is not to be ignored.

Reasons for retreat of Naxalism

1. Security measures :- like operation greenhunt, operation-all out taken up.
2. Surrender policy @ Thankend giving & 1 acre land & ₹2000 pensions to rehabilitate
3. Good enforcement of FRA + LARR 2013 → Xaxi Committee report

4. Government delivery of development →
- Last 8 years
- 11000 km roads
 - ₹3000 crore
 - 5000 post offices
 - 2500 mobile towers
- built in LWE areas.

Factors behind its continuance:

1. Geographical terrain:- Dense Dandak Aranya forests → difficult to operate missions by CRPF, especially in monsoons.
2. Tribal Nature:- Hardy and resistive by nature.
3. Continued mis governance → 5th schedule Areas (AArde 244(I)) → government does not hold elections in TAC bodies
4. Denial of rights to say no @ Forest Act/Rules 2012 → Gram Sabha bypassed.
5. Organised crime nexus:- Trafficking, crime used to fund operations.

6. Lack of technology in forces @ Poor IED detection technology of CRPF → deaths.

Measures Needed

1. Nature-Man-Spirit Complex :- realise their value toward gal-gangal-jamein & honour them.
2. Good Governance :- Health, education, Skill development, MFP need to be developed.
3. Administrative effectiveness @ Avoid delays, like 3 decades to build Gurupriya Bridge
4. International Collaboration :- @ Bangladesh to avoid Safe havens.
5. Security measures + SRE, MAC, Special forces like Greyhound and better intelligence.

Hence, there is need of a 360° policy like SAMADHAN to uproot Naxalism & restore peace in red corridor area

Feedback

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Q.16) Across sectors and regions, the most marginalised sections are also the most affected by the impacts of climate change. Explain. Also, present a case for a climate resilient model of development that integrates mitigation and adaptation measures.

(15 marks, 250 words)

विभिन्न खंडों और क्षेत्रों में, सबसे अधिक हाशिए पर रहने वाले वर्ग भी जलवायु परिवर्तन के प्रभावों से सबसे अधिक प्रभावित हैं। व्याख्या कीजिए। इसके अलावा, विकास के जलवायु लचीले मॉडल के लिए एक मामला प्रस्तुत कीजिए जो शमन और अनुकूलन उपायों को एकीकृत करता है।

(15 अंक, 250 शब्द)

A Concept of climate justice has been gaining traction at Cop27 in Egypt, and it recognises the differential impact and inequity in effects of climate change.

Across Sectors :-

① Agricultural Sector :- 80% Small & Marginal farmer most vulnerable to vagaries of climate → debt, meagre production

② Manufacturing/ Industry sector @ 90%
Unskilled labour force → 50% of these are exposed to high temperature & heat waves in operating hours.

③ Urban sector :- @ Slums bear the brunt of displacement, diseases during climate

Induced disasters like Cyclones & floods.

Across Regions

1. Developing Countries ^(a) (eg) Indonesia's sinking Capital caused by sea level rise
 (b) disaster costs (eg) India bore \$ 80bn losses by disasters in 2020 alone.
2. LOCs (eg) Africa SAHEL region → poorest region → most vulnerable to increased desertification caused by climate change.

Climate Resilient Model of Development

1. Adaptation / Short term measures :-
 - a) Makes our practices more resilient (eg) Practicing climate smart Agriculture (IoT AI use)
 - b) Include DRR in policies (eg) Odisha Model to prevent casualties by Cyclones.
 - c) Have Monitoring & EWS in place (eg)

Doppler radar measures wind speed at
top of Banihal tunnel J&K.

d) Increased funding (eg) Adaptation gap
report suggests \$4-6 tn/year needed by
world to adapt.

Mitigation Strategies

1. Reducing GHG emissions (eg) Biofuel
blending - EB Policy 2018.
2. Alternate sources of energy (eg) Solar, wind
energy
3. Decarbonised sectors (eg) Steel sector →
Green steel.
4. Invest in Carbon Capture technologies

We can surely achieve goal of 2°C by Paris
Agreement, there is need of political will
focus, as said by PM in launch of L1-PE;

Feedback

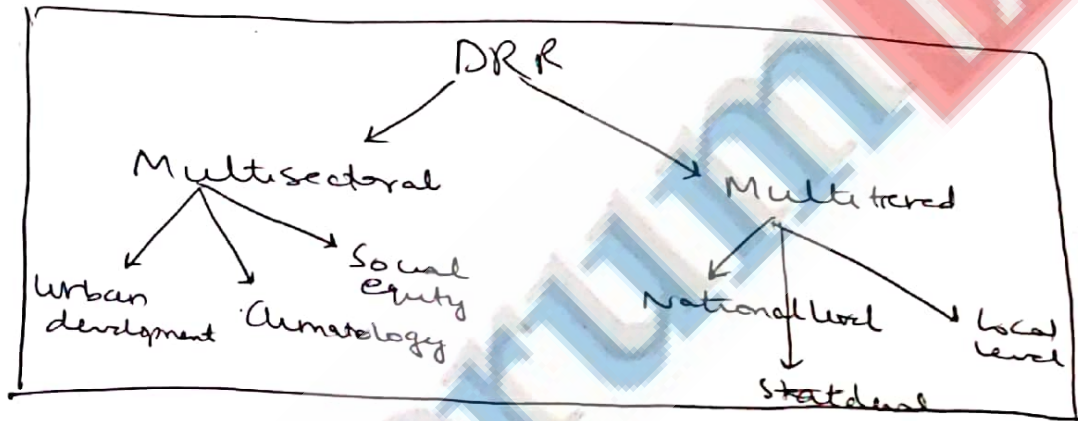
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Q.17) A multi-sectoral and multi-tiered process, Disaster Risk Reduction (DRR) is beset with a plethora of constraints. Identifying these constraints, recommend measures for building a robust DRR strategy. (15 marks, 250 words)

एक बहु-क्षेत्रीय और बहु-स्तरीय प्रक्रिया, आपदा जोखिम न्यूनीकरण (डीआरआर) कई बाधाओं से घिरी हुई है। इन बाधाओं की पहचान करते हुए, एक मजबूत डीआरआर रणनीति बनाने के उपायों की सिफारिश कीजिए। (15 अंक, 250 शब्द)

A DRR has been recognised as most effective way for adapting to climate change & disaster resilience in the Sendai framework.



Plethora of constraints

1. Top-down approach → Guidelines prepared at central level and asked to cooperate at bottom levels.
2. Siloes Approach :- Different ministries for different disasters → Lack of coordination.

3. Clash of functions (eg) Overlap of functions
of National Executive Council & National
Crisis Management Committee.

4. Shortage of funds & materials (eg)
a) West Bengal DRF minister asking for
extra funds.
b) Parliamentary Committee 2019 → NDRF,
SDRF → shortage of every item allotted to
them

5. Poor Awareness & Capacity building → People
are untrained (eg) In earthquake → no
knowledge of "Duck & Cover" method.

6. Weak neighbourhood collaboration (eg)
Nepal cutting trees in upstream Kosi →
more floods in Behar

Robust DRR Strategy 1- Follow 2019 Plan

1. Preparedness :- Includes having HVRA
a)

(Hazard vulnerability Risk Assessment) (e)
 GIS Maps of earthquake zones.

b) Structural & non structural measures:-

- (e) building reinforcement
- (e) slope stabilisation
- (e) Radars

- (e) review guidelines
- (e) review preparedness.

2) Response plans



3) Capacity building & Awareness → Mock drills, local support building (e) Apta Mitras

4) Build back better → Resilient Infrastructure

ARC Recommendation

1. establish disaster mitigation fund
2. Clear chain of command.
3. decentralise DRR to local levels.

Together we can make India disaster proof

as Kalwar has said - "we are the problem

And we are the solution to natural disasters"

Feedback

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Q.18) Though ethnic fault lines are a major threat, security challenges in the North-East are not confined to the same. Discuss the statement with special reference to Manipur.

(15 marks, 250 words)

यद्यपि एथनिक फाल्ट लाइन्स (नृजातीय त्रुटिपूर्ण रेखाएँ) एक बड़ा खतरा हैं, उत्तर-पूर्व में सुरक्षा चुनौतियाँ यहीं तक सीमित नहीं हैं। मणिपुर के विशेष संदर्भ में कथन पर चर्चा कीजिए।

(15 अंक, 250 शब्द)

A North east occupies 8% of India's area, and habitats for 4% of the population, however security challenges are multitudinal and inherently complex.

Ethnic faults lines are major threat

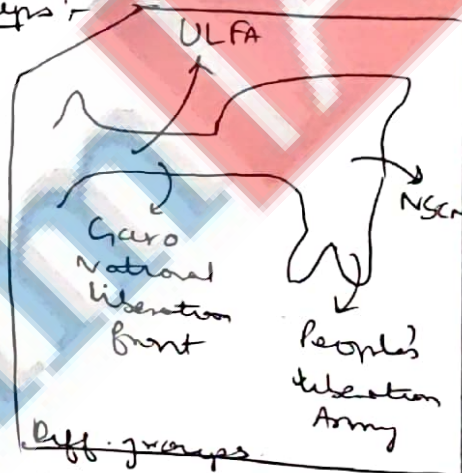
1. Multiple tribes inhabit the area @
Nagas → 50 different groups.
2. Historical legacy of alliances & rivalries.

@ CASE OF MANIPUR :- The hold of jobs and political representation is tilted in favour of Merties, however Kukis have clashed against ST reservation to forward Merties. It has resulted in law and order condition.

Challenges not confined to Ethnicity

1. Geography :- Dense evergreen & semi-green forests
 → hell for security forces
 → paradise for insurgents.

2. Present of Anti-India groups :-



3. Border challenges :- Free movement regime with Myanmar → Insurgents free movement

4. Historical demand (eg) Nagaland demand by Nagas

5. Drug Trafficking :- Golden triangle (Laos, Myanmar, Thailand) vicinity.

6. Lack of development :- Neglect of area → (eg) 89x rural areas.

7. International threats @ China
 ↓
 • Arunachal Border clashes 2022
 ↓
 illegal support to insurgents

8. Illegal Migration → from Bangladesh & Rohingyas from Myanmar.

Steps needed

1. Border Management: Upgrade to SMART borders, cameras, IR sensors and integrated checkposts.
2. People engagement → people centric development
 @ Vibrant villages program
3. Security measures → ITBP & Assam Rifles training
4. Governance improve @ DoNER, Pm-DEVINE scheme

As a result of concerted efforts, conditions have improved & AFSPA remains in 31 districts of 4 states only & thus ensuring safe & secure North east.

Feedback

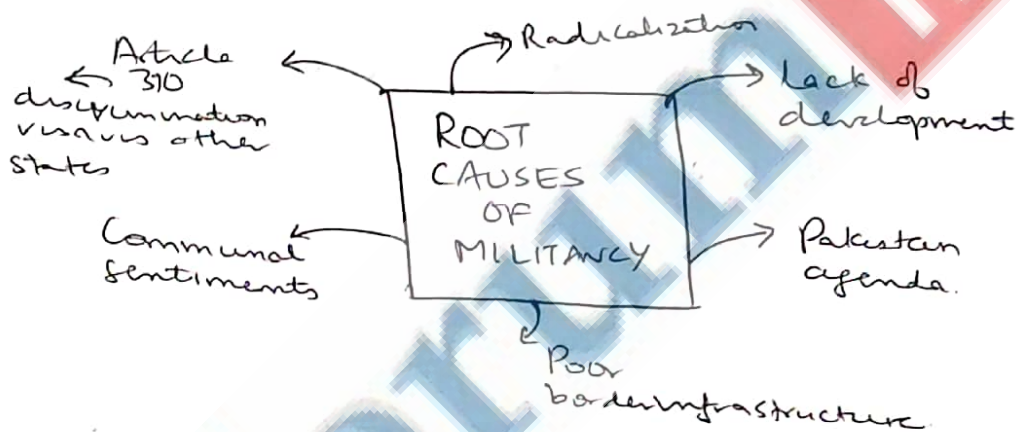
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AWIS			
CD & VA			
S & F			
P & R			
Please put tick marks in the above table. Here G is Good, A is Average and P is Poor.			
TOTAL MARKS			

Q.19) Critically examine the role of development initiatives in addressing the root causes of militancy/ terrorism in Jammu & Kashmir. (15 marks, 250 words)

जम्मू और कश्मीर में उग्रवाद/आतंकवाद के मूल कारणों को संबोधित करने में विकासात्मक पहल की भूमिका का आलाचिन्तात्मक परीक्षण कीजिए। (15 अंक, 250 शब्द)

A J&K has had the dubious status of crown of India & hotbed of terrorism in the post independent era. But after abrogation of article 370, things have changed.



Role of development initiatives to address root Cause of militancy.

1. Satisfy needs of population :- J&K has received ₹75000 cr FDI since 2019, → Industrial huge growth in the region
2. Employment generation @ GI Tags for Papier Machie → art & craft revival.

3. Infrastructure buildy → border infra upgrade
CIBMS → SMART border → less infiltration.

4. Focus on School opening & education →
zero days of school closure in 2021 (J&K) →
better counter to radicalization.

5. Opening of Opportunities to Youth @ Youth from
Kashmir @ IAS Amir Athar → promoting as
good role model for anti-militancy
efforts.

However, certain new Issues have emerged
in addition to unaddressed agendas :-

1. Pakistan Angle & use of drugs has been
promoted in the valley for its own agenda.

2. Border Infrastructure - MHA Reports →
delayed → still not 100% border fencing

3. Resentment :- Against AFSPA excesses and shootings

4. Hybrid terrorists :- emerged an execute the minority community of Sikhs & Kashmiri Pandits

Steps further needed

1. Community engagement :- To ensure their demands are heard & problems are taken up

2. Local employment & industry promotion → handholding must be done to ensure private MNC's don't over power them

3. Social Media monitoring → to prevent radicalization of youth.

With a holistic focus, the area can witness highest levels of growth, as projected by the

UT budget of 23-24 to be 10%.

Feedback
(For OFFICE use only)

#	G	A	P
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Please put tick marks in the above table. Here G is Good, A is Average and P is Poor.			
TOTAL MARKS			

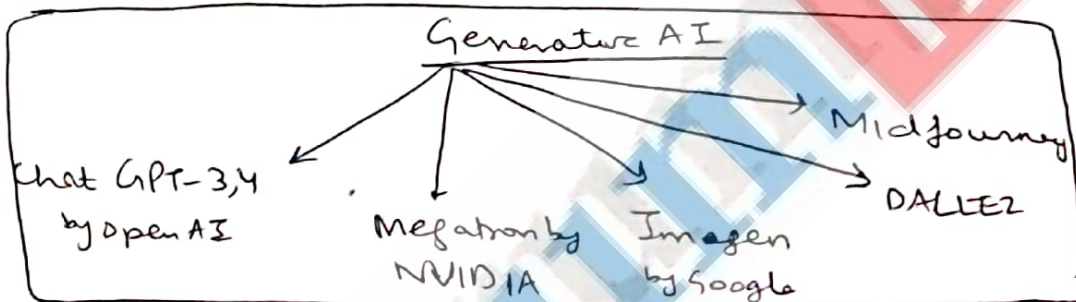


Q.20) What do you understand by generative Artificial Intelligence (AI)? How can policymakers and regulatory bodies effectively address the concerns and challenges posed by generative AI? (15 marks, 250 words)

जनरेटिव आर्टिफिशियल इंटेलिजेंस (एआई) से आप क्या समझते हैं? नीति निर्माता और नियामकीय निकाय जनरेटिव एआई द्वारा उत्पन्न चिंताओं और चुनौतियों को प्रभावी ढंग से कैसे संबोधित कर सकते हैं?

(15 अंक, 250 शब्द)

A Generative AI is a subset of computer intelligence that uses the algorithms to generate new content — written, pictorial, video based or otherwise

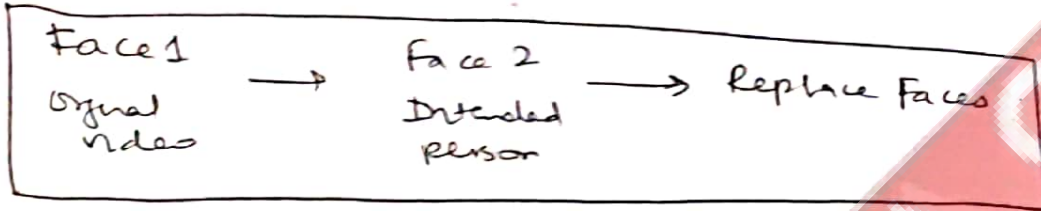


Concerns & challenges posed by Generative AI

1. Bias :- trained on limited data → ethno-centric bias @ Midjourney making Indian population as all blacks.

2. Piragaurism :- copying original content of creators is also seen.

3. Problem of Deepfakes → false narratives built



4. Illicit content proliferation @ Asking AI to create hate-speeches against certain communities.

5. Unemployment: Forrester Report claims 68% job losses in future by automation.

Ways to address the concerns of Generative AI.

1. IP/Copyright enforcement :- locking content that is originally created. @ Copyright on movies

2. Ethical principles tuning: @ AI needs to be trained to avoid creation of

pornographic deepfakes.

3. Fact checking units (eg) US has a task force for Generative AI regulation

4. Risk based Assessment of GAI :- Allowing generative in less risky domains only.

5. Human Resource development :- Capable digital force to handle any crisis condition, as well as safeguard their employment by upskilling

6. Public Dataset based training → Increase and ethic dataset for accurate training

We can follow the Hiroshima AI process for development for Generative AI so that it works for HUMANITY, not against it.

Feedback

(For OFFICE use only)

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TOTAL MARKS			