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Name of Candidate : AREA USMANI

Roll No. : PTTP 221371

Registration Number : ..... **Date of Examination :** 23-08-23

Exam Centre : Old Rajinder Nagar ☐ Bhopal ☐ Online ☑

Test - 3 (IGP GS 3) **Code : TC073**

MTS IGP Batch 2023

GENERAL INSTRUCTIONS

This Question-cum Answer (QCA) Booklet contains 56 pages. Immediately on receipt of the booklet, please check that this QCA booklet does not have any misprint or torn or missing pages or items, etc. If so, get it replaced by a fresh QCA booklet.

Candidates must read the instructions on this page and the following pages carefully before attempting the paper.

Candidates should attempt the questions strictly in accordance with the instructions specified in the question paper and in the space prescribed under each question in the booklet. Any answer written outside the space allotted may not be given credit.

Question paper will be provided separately and can be taken by the candidates after conclusion of the exam.

.....

SUBJECT/PAPER
GENERAL STUDIES

Invigilator's Sign. : .....

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(For filling by Examiners only)

Evaluator Code :

Q.No	Pg No.	Maximum Marks	Marks	Total
1	1			
2	3			
3	5			
4	7			
5	9			
6	11			
7	13			
8	15			
9	17			
10	19			
11	21			
12	24			
13	27			
14	30			
15	33			
16	36			
17	39			
18	42			
19	45			
20	48			
Grand Total				

Signature

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MACRO COMMENTS

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Q.1 अप्रत्याशित कर (विंडफॉल टैक्स) से आप क्या समझते हैं? क्या आपको लगता है कि अप्रत्याशित करों से संपदा का प्रभावी ढंग से पुनर्वितरण हो सकता है और अधिक आर्थिक समानता को बढ़ावा मिल सकता है?

(150 शब्दों में उत्तर दीजिए) 10 अंक

What do you understand by Windfall tax? Do you think that windfall taxes can effectively redistribute wealth and promote greater economic equality?

(Answer in 150 words) 10 Marks

Windfall tax is a tax on corporations during times of above average profit, due to certain exceptional events.

For eg. Indian govt taxed windfall tax on petrol companies recently when their profit arose exceptionally high due to cheap imports from Russia (Russia-Ukrain conflict).

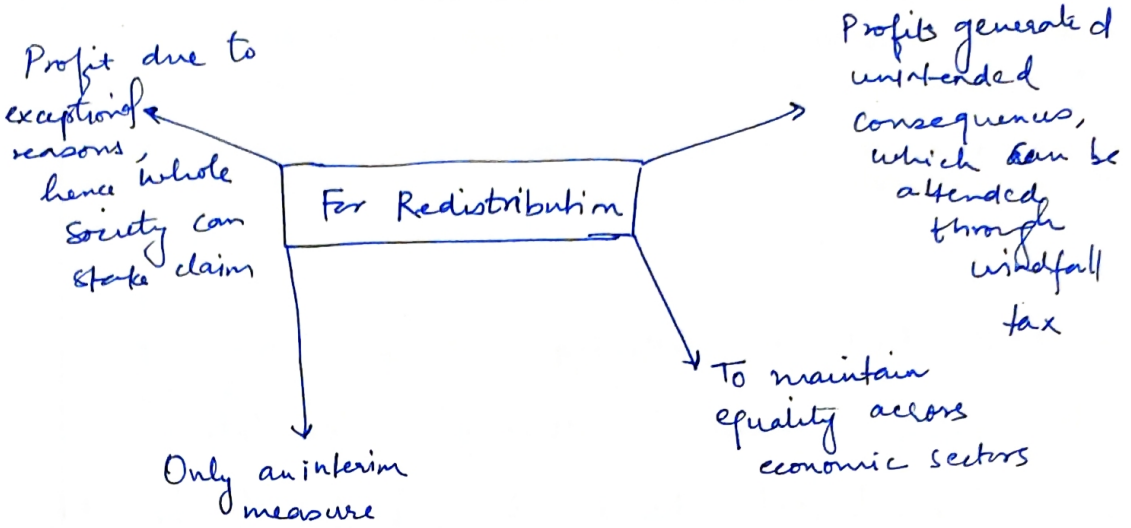
Effective Redistribution or Not

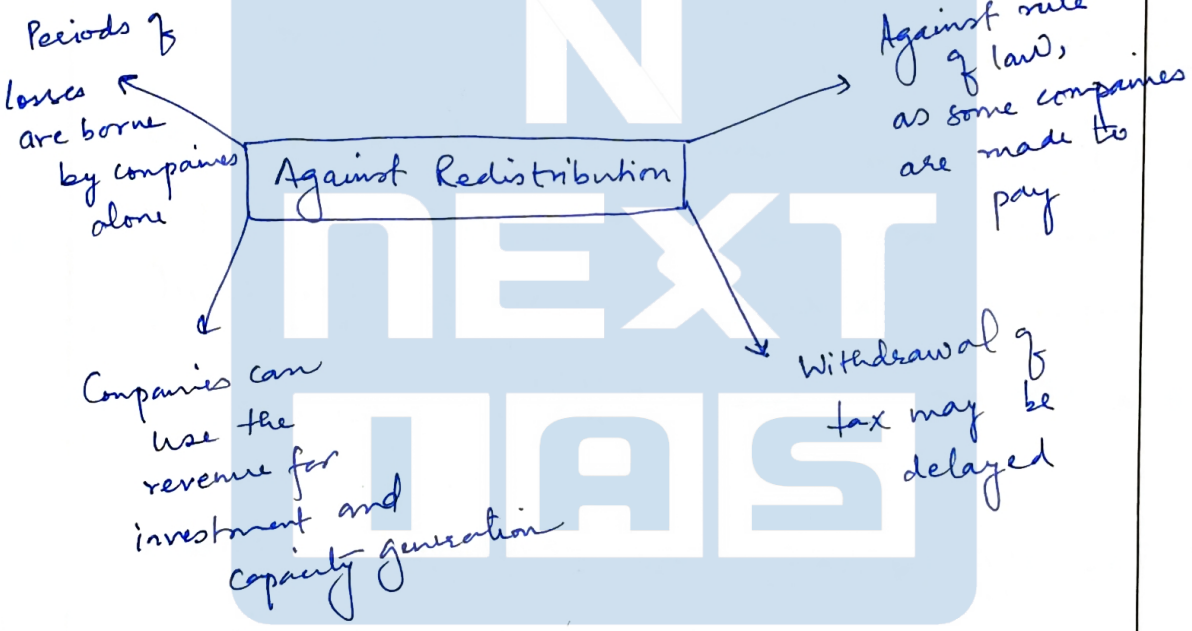
* The rationale is that such abnormal profits are against economic equality, and should be redistributed via govt.

* Similar calls were made to tax the profits generated by ~~millionaries~~ millionires and billionires from stock market during Covid, when the real economy was suffering.

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Thus, objective decision-making is required to levy windfall tax so that competing interests are managed.

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Q.2 नई मौद्रिक नीति समिति (एमपीसी) व्यवस्था के अंतर्गत मुद्रास्फीति लक्ष्यीकरण को क्रियान्वित करने की कथित सफलताओं और चुनौतियों पर चर्चा कीजिए। (150 शब्दों में उत्तर दीजिए) 10 अंक

Discuss the perceived successes and challenges of implementing inflation targeting under the new Monetary Policy Committee (MPC) regime. (Answer in 150 words) 10 Marks

Since 2016, RBI is following inflation targeting as its prime mandate through legislative change. The target band is 4 ± 2 % for CPI, (retail). while managing growth. (2 to 6 %).

Successes

* Inflation has been brought down, and the mandate has been successful (barring exceptional external circumstance like covid and Russia - Ukraine conflict).

* The very mandate has anchored expectations of various stakeholders (companies, stock markets, consumers etc) which has led to more confidence and better planning.

* Since inflation is a tax on poor, lowering of inflation has ensured greater economic equality.

* Indian economy has attained stability, raising confidence of investors (both domestic and foreign)

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Challenges

- Food & fuel comprise almost 50%, which depend on import and agriculture vgaries (eg: tomato price crossing Rs 100 / kg)

* Critics argue that inflation targetg has compromised economic growth (for eg: not lowerg repo rate enough during Covid).

- Challenges of unable to maintain CPI within band in recent past will erode credibility of RBI. It has remained near 6% instead of 4.

Thus, largely, RBI has been successful in its mandate, and medium term prospect are promising.

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Q.3 भारत में सतत् कृषि को बढ़ावा देने और खाद्य सुरक्षा में सुधार के लिए मोटे अनाज उत्पादन की क्षमता का आकलन कीजिए।
(150 शब्दों में उत्तर दीजिए) 10 अंक

Assess the potential of millet production in promoting sustainable agriculture and improving food security in India.
(Answer in 150 words) 10 Marks

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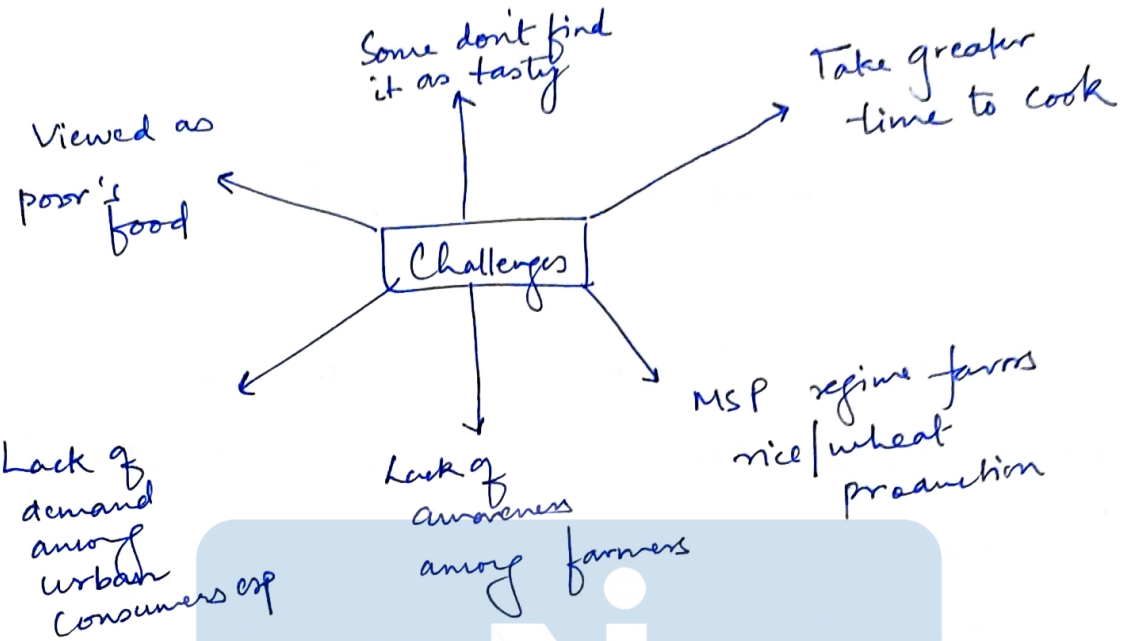
Millets are hardy crops with high nutritional value. UN has declared 2023 Int'l Year of Millets in view of this.

Millet & Sustainable Agriculture / Food Security

* Compared to rice & wheat, millets require much less input like water, fertilisers and pesticide.
* They are heat and drought-tolerant, providing insurance against food security.
* They don't require as fertile soil as rice/wheat, thus can be grown over large ranges of agro-climatic zone (eg: Vidarbha).
* They have high genetic yield potential.
* Versatile use cases (dosa, biscuit, pancake, roti etc)

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Govt has taken various steps to promote millet production, including setting up a Centre of excellence in Hyderabad (Indian Institute of Millet Production).

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Q.4 जल जीवन मिशन में पेयजल की उपलब्धता और पेयजल तक पहुँच में क्षेत्रीय विषमता को समाप्त करने का सामर्थ्य है। मिशन के महत्त्व पर प्रकाश डालते हुए, वांछित उद्देश्यों की प्राप्ति में अंतर्निहित बाधाओं पर चर्चा कीजिए।

(150 शब्दों में उत्तर दीजिए) 10 अंक

Jal Jeevan Mission has the potential to end the regional disparity in the availability and accessibility of drinking water. Highlighting the significance of the mission, discuss the underlying impediments in achieving the desired objectives.

(Answer in 150 words) 10 Marks

Jal Jeevan Mission (JJM) aims at providing ~~tapped~~ ~~drug~~ tap drinking water to all rural households by 2024. This will significantly ~~to~~ enhance availability & accessibility of drinking water.

Significance

* Quality of life would improve, as water is a basic necessity.

* Gender equality, as women bear the prime responsibility of arraging water (often walking miles). Crimes against women ~~too~~ also likely to decrease.

* Health and sanitation would improve.

* Multidimensional poverty alleviation

* Would free up people's time to pursue other activities (eg: women's SHGs).

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Impediments

- Many regions are water stressed, and availability of water can thus be a challenge.
- Irregularity of monsoon.
- Infrastructure to lay pipes is required which requires time, ~~and~~ money and engineering skills.
- Rationing of water is required to avoid wasteful uses.
- Deciding price of water is a politically sensitive topic. May increase govts subsidy budget.
- Ensuring water quality amidst pollution is challenging.

JJM is a scheme with multiple benefits, and its success would greatly enhance people's quality of life.

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Q.5 बैटरी ऊर्जा भंडारण प्रणाली (बीईएसएस) से आप क्या समझते हैं? इसके अनुप्रयोगों पर चर्चा कीजिए और यह भारत के ऊर्जा कार्यक्रम में किस प्रकार क्रांतिकारी बदलाव ला सकता है। (150 शब्दों में उत्तर दीजिए) 10 अंक

What do you understand by Battery Energy Storage Systems (BESS)? Discuss its applications and how it can revolutionize the energy program of India. (Answer in 150 words) 10 Marks

In the context of renewable energy.

BESS indicates ways of storing energy to be used later at an appropriate time. For eg. solar energy during day to be used for night time lighting.

Applications

* When energy is generated intermittently, it can be stored (for eg: wind energy) and used later.

* In EVs, BESS can provide greater range.

* ~~Its~~ It can facilitate self-sufficient units in terms of energy, without integrating into the power grid (eg: in house solar production with BESS in a farm).

* Anything which requires energy can use BESS (eg: solar street light, house electricity etc)

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Revolutionise Energy Program

* Major problem with renewable energy is its intermittent nature (compared to coal which is available on demand 24*7). BESS solve this.

* Problem of integrating with grid is also managed with BESS.

* Reliance on fossil fuels for transport sector can be reduced with BESS. This would greatly reduce oil import bill.

However, cost, technology and domestic production of BESS remains a challenge. Focus in PLI for domestic production of batteries is a positive step in this context.

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Q.6 इसरो के गगनयान मिशन में हुए विकास और उपस्थित चुनौतियों पर संक्षिप्त चर्चा कीजिए। समाज के लिए मिशन के संभावित लाभ क्या हैं? (150 शब्दों में उत्तर दीजिए) 10 अंक

Discuss in brief developments and challenges in the Gaganyaan mission of ISRO. What are the possible benefits of the mission for the society? (Answer in 150 words) 10 Marks

Gaganyaan mission entails spending humans into space (low earth orbit 400 km) by 2024-25 by ISRO.

Developments

- Fail safe measures are being tested, i.e. ensuing safe return of astronauts in case of any technical malfunction. This a priority focus area.
- Humanoid has been developed to first test before sending actual humans.
- Traing of astronauts in zero gravity environment with Russian aid has begun (though hiccups seen due to Russia - Ukraine Conflict).

Challenges

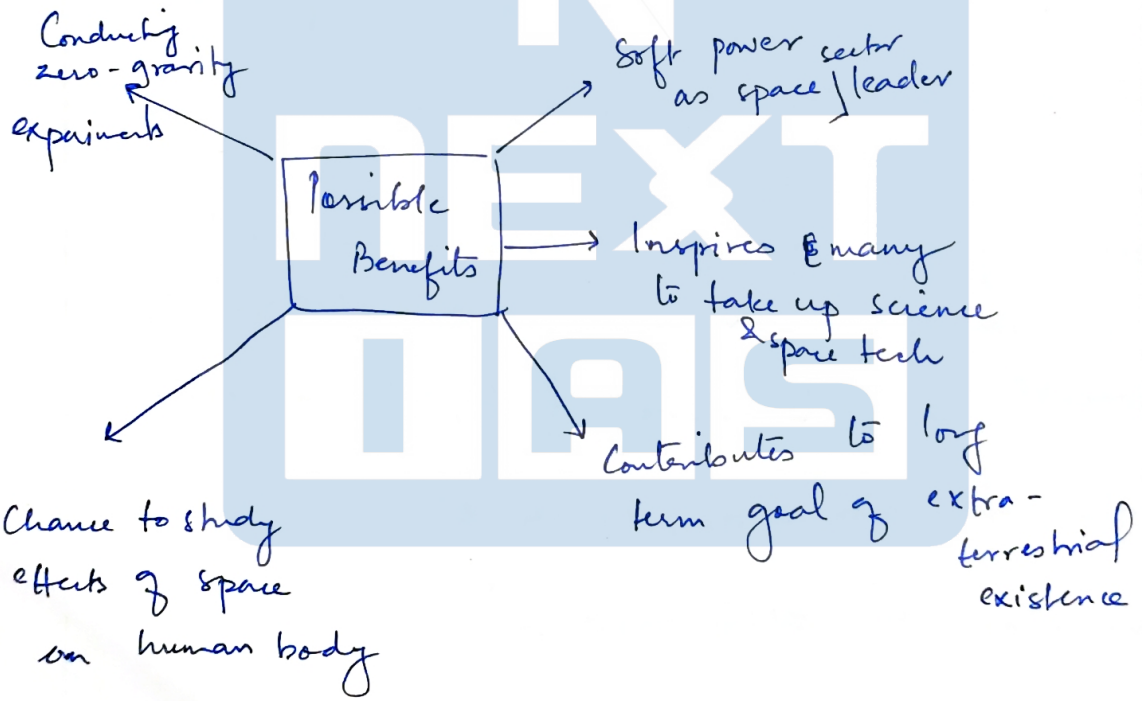
- Covid & Russia-Ukraine conflict has delayed the timeline

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* Sending humans means bringing back the spacecraft into atmosphere. The threat of ignition on re-entry is the major challenge (eg: Kalpana Chawla's death).

* Survival of humans in space needs a lot of planning, from tackling zero gravity to intake of food, space suits, waste disposal mechanisms etc.



Thus, Gaganyaan is an important mission. ISRO has further plans of launching India's space station by the end of this decade.

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Q.7 "जलवायु परिवर्तन और प्रदूषण से निपटने की हमारी खोज में हरित हाइड्रोजन एक सरल और जादुई समाधान हो सकता है"। भारत के राष्ट्रीय हरित हाइड्रोजन मिशन के आलोक में कथन का आलोचनात्मक विश्लेषण कीजिए।

(150 शब्दों में उत्तर दीजिए) 10 अंक

"Green hydrogen can be the silver bullet in our quest to tackle climate change and pollution". Critically analyze the statement in light of India's National Green Hydrogen mission.

(NGH)

(Answer in 150 words) 10 Marks

NGH envisions a capacity of green hydrogen production of 5 MMT by 2030. It has the potential to play an important part in India's Paris Deal targets and in tackling climate change.

Pointers of Green Hydrogen

- Green hydrogen means hydrogen produced from renewable energy (using electrolysis of water). Thus, its carbon footprint is minimal.
- Fuel for automobiles, trucks etc
- Reduction in GHG emission
- More energy dense than fossil fuels
- Clean energy (no smoke, PM, GHGs etc)
- More efficient than fossil fuels (per kg more energy)

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Negatives

- High cost of production currently. Govt is providing funds currently to make it more economical via R&D.
- Storage & transport is an issue since Hydrogen is combustible.
- Cannot substitute all energy requirements at current technology
- Entire ecosystem needs to be built to use hydrogen as fuel (eg: hydrogen refuelling stations for cars)

Thus, green hydrogen is energy for the future, but needs investments and policy support to ensure widespread usage.

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Q.8 हाल ही में जोशीमठ, उत्तराखंड में आई आपदा के आलोक में, हिमालय क्षेत्र में आपदा प्रबंधन और पर्यावरण संरक्षण के लिए मुख्य सबक क्या हैं? (150 शब्दों में उत्तर दीजिए) 10 अंक

What are the key lessons for disaster management and environmental conservation in the Himalayan region, in light of the recent disaster in Joshimath, Uttarakhand? (Answer in 150 words) 10 Marks

Joshimath, a town raised on soil accumulated from landslide, has undergone land subsidence recently. Cracks have developed in buildings, forcing people to evacuate. ISRO is of the view that the subsidence is irreversible.

Key Lessons

- The concept of carrying capacity is to be respected. Despite red flags raised, tourism & development infrastructure continued unregulated. This breached the carrying capacity of the ecosystem.

- Since Himalaya is a tectonically active region, rocks are soft and unstable. Construction has to be sustainable in view of this (eg: ~~slope~~ slope stabilisation techniques)

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- Ecotourism is required.
- Due respect to local traditional knowledge in designing policies of construction, disaster management.
- Reducing deforestation, encouraging afforestation to ensure binding of soil.
- R&D into the region to collect data & observe signs of early change.
- Checking unregulated growth of hotels, resorts etc

Joshimath has made real the drastic consequences of neglecting climate in the quest for growth. Urgent measures are required to contain it.

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Q.9 "पंजाब में हालिया कट्टरपंथी रुझानों से पता चलता है कि खालिस्तान का मुद्दा अभी भी उबल रहा है।" हालिया घटनाक्रम के संबंध में कथन पर चर्चा कीजिए और इससे निपटने के उपाय सुझाएँ।

(150 शब्दों में उत्तर दीजिए) 10 अंक

"The recent radical trends in Punjab show that the Khalistan issue is still simmering." Discuss the statement with respect to recent developments and suggest measures to handle it.

(Answer in 150 words) 10 Marks

The insurgency in Punjab has reared its head once again after the violent decade of the 1980s.

Recent Developments

- The quick rise of Amrit Pal as voice of Khalistan cause took the administration by surprise. Innovative techniques like use of Guru Granth Sahib by protestors raised a unique challenge before Punjab police.

- Amrit Pal's inflammatory speech & idolising Bhindranwale had a huge impact on Youth, who mobilised in his support and also raised demands of secession.

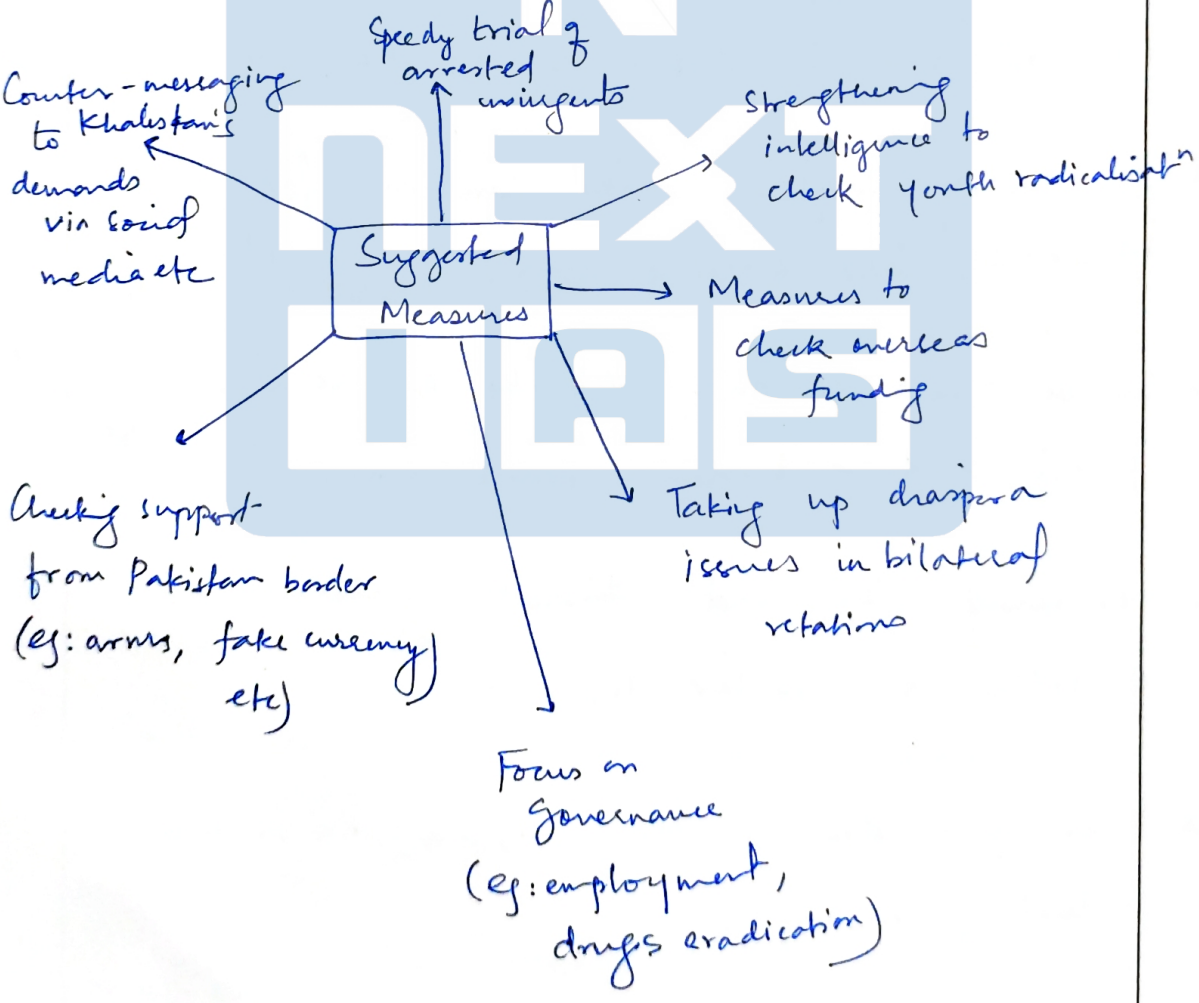
- Overseas support from Punjabi diaspora from Australia, UK, Canada etc was also

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seen. Funds were provided, while temples were damaged as signs of rebellion. Indian foreign policy raised due objections promptly.

↓ After much disguise & running away, Amrit-Pal finally surrendered and is undergoing trial. However, ~~diasporic~~ diaspora's activities have continued.



Secessionist tendencies need holistic approach for lasting solution, including both soft and hard measures.

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Q.10 ड्रोन संचालन में आसानी और साथ ही इसके संचालक की अनामिता, भारत की सीमा सुरक्षा की चुनौतियों में वृद्धि करती है। विस्तारपूर्वक वर्णन कीजिए और सीमावर्ती क्षेत्रों में ड्रोन समस्या से निपटने के लिए सुझाव दीजिए।

(150 शब्दों में उत्तर दीजिए) 10 अंक

The anonymity and ease of drone operation contribute to the challenges of India's border security. Elaborate and give suggestions to tackle the drone problem in border areas.

(Answer in 150 words) 10 Marks

Drone is an UAV (unmanned aerial vehicle) operated remotely.

Challenges of Drone

- Its range makes it difficult to catch the operator even if drone is caught.
- Can carry payloads like camera for espionage, fake currency, arms, drugs etc
- Can be used to carry attacks as seen in India, and in Russia–Ukraine conflict.
- Its small size and discreet nature makes detection by radar difficult.
- Even if a drone is shot-down, no major power is lost of enemy.
- Cost effective compared to missiles etc
- Can navigate complex terrain with relative ease

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- Small size makes their transport easy as well.
- Easy to manufacture (in-house as well)

Tackling Drones in Border Areas

- Indigenous tech has developed to trace drones by DRDO. This will ease neutralising them.
- Training local community to identify and report drones.
- Developing offensive capability to track & for surveillance
- Regulating trade to check supply side of the problem.
- Global coordination is also required to check access to military drones by non-state actors.

Drones also have many positive uses, like delivery of medicines, survey of area, photography and more.

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Q.11 विद्युत संशोधन विधेयक, 2022 उपभोक्ताओं, डिस्कॉम के साथ–साथ पर्यावरण के लिए कई लाभ प्रस्तुत करता है। सविस्तार वर्णन कीजिए। साथ ही इसकी कमियों को भी सूचीबद्ध कीजिए और उन्हें दूर करने के लिए कुछ उपायों का भी सुझाव दीजिए। (250 शब्दों में उत्तर दीजिए) 15 अंक

(EAB)
Electricity Amendment Bill, 2022 brings several advantages for consumers, DISCOMs as well as the environment. Elaborate. Also, list out its shortcomings and suggest some measures to overcome them.
(Answer in 250 words) 15 Marks

~~Elec~~ Power sector is ridden with many problems like indebtedness of DISCOMS, low quality of power to consumers and reliance on coal. EAB aims to rectify these.

Advantages

- For consumers, the bill focuses on ensuring accessibility and affordability of electricity. It gives a right-based approach to electricity.

- For DISCOMS, fair pricing & regular revision of ~~tariffs~~ tariffs aims at solving the revenue problem. It also aims at providing independence to DISCOMs in their operation.

- Provision of installing smart meters for checking electricity theft, better billing etc

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- Focus on shifting to renewables for checking GHG emissions.
- Provision for R&D to check AT&C losses in transmission.

Shortcomings

- Ensuring access to electricity as a matter of right has infrastructural constrains.
- Smart meters are costly, and it's tough to obtain the targets without subsidy.
- Electricity is a concurrent ~~issue~~ subject in constitution thus each State has autonomy.
- Electricity pricing has become a political issue (eg: free power to farmers and in households in Delhi, Karnataka).

This raises challenges of revenue.

- 70% electricity is coal generated even today, despite 40% installed power being renewables.

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Q.12

Measures

- State specific approach with respective goals in loop
- Regulating electricity tariff in a way that is sustainable in the long run via cooperative federalism (eg: like GST)
- Better integration of renewable energy into grid, and lowering its tariff for greater adoption.
- Investing in green energy.
- Making coal based power plants more efficient and environment friendly (eg: using washed coal)

Electricity is a basic necessity, with multi-dimensional impact like quality of life, economic activity and safety in streets. Thus, EAB gains significance in this context.

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Q.12 भारतीय प्रतिभूति एवं विनिमय बोर्ड (सेबी) शेयर बाजार के नियमन और निवेशकों के हितों की सुरक्षा में महत्त्वपूर्ण भूमिका निभाता है। दिये गए कथन के आलोक में, सेबी के समक्ष आने वाली चुनौतियों पर प्रकाश डालिए और इस संबंध में सुधारों का सुझाव दीजिये। (250 शब्दों में उत्तर दीजिए) 15 अंक

Securities and Exchange Board of India (SEBI) plays an important role in the regulation of the share market and safeguarding the interests of investors. In the light of given statement, highlight the challenges faced by the SEBI and suggest reforms in this regard. (Answer in 250 words) 15 Marks

SEBI is a statutory/regulatory body formed in the 1990s after the LPG reforms to regulate the stock market and protect retail investors.

SEBI's Role

- It mandates disclosure norms for public listed companies and ensures corruption free corporate governance.
- It has standards in place to check insider trading, & price manipulation etc
- It regulates mutual fund mangers and collusion among them.
- Listing of companies via IPO is regulated by SEBI.
- Investigates charges of wrong doing & money laundering (eg: probe into Adani ongoing)

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* Takes measures to educate investors
* Regulates financial advisors by registering them.
* Looks into complaints of investors
* Regulates stock brokers.
* Looks into adoption of tech into markets (eg: settlement cycles reduced)
* Regulates foreign investors ~~etc~~

Challenges Faced

* Rising trend of price manipulation by unregistered advisers via mediums like youtube, twitter etc.
* Difficult to keep track of shell companies because of cross-jurisdiction
* Stock market participation is low in India (<5%).
* Effect on stock market because of global stock market performance (eg: NYSE) tough to manage.
* IPO listing of Indian companies in foreign jurisdiction like Singapore.

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* Alternate investments like bitcoin emerging, whose legal status is not clear.
* Corruption in corporate governance

Reforms Needed

* Better regulation of influencers on social media. AI can be used to check for such advice.
* Need to increase awareness among public to mobilise greater funds, while educating about the risks.
* Need constant tech upgradation for emerging alternate digital assets.

SEBI's credibility is well established, and needs to evolve with changing times.

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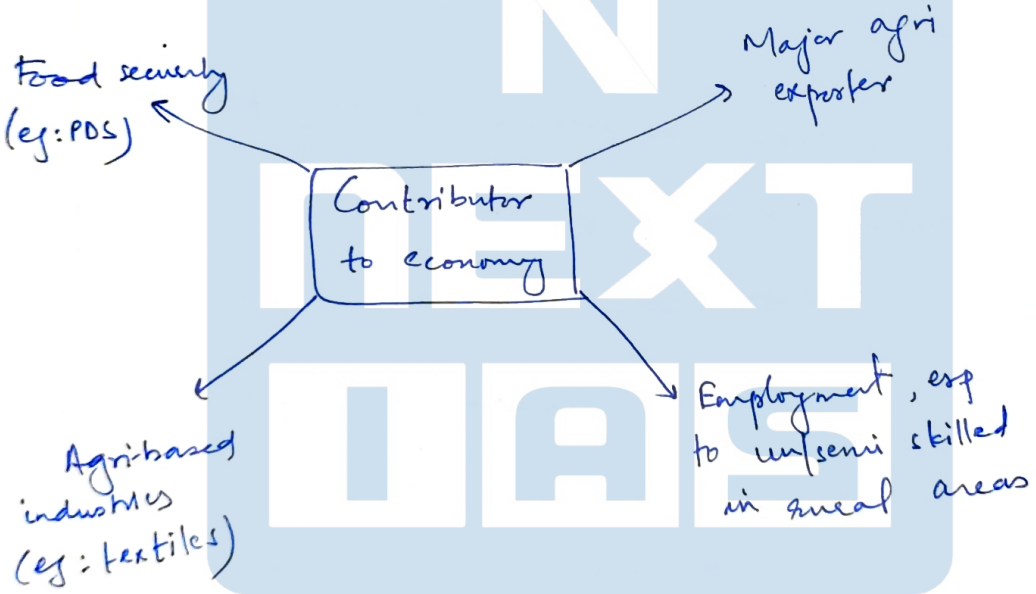
Q.13 भारतीय अर्थव्यवस्था में एक प्रमुख योगदानकर्ता होने के बावजूद, कृषि क्षेत्र कई बाधाओं से ग्रस्त है जो इसकी वृद्धि और विकास में बाधा डालते हैं। इन बाधाओं पर काबू पाने में प्रौद्योगिकी की भूमिका पर चर्चा कीजिए।

(250 शब्दों में उत्तर दीजिए) 15 अंक

Despite being a major contributor to the Indian economy, the agriculture sector is plagued by several constraints that impede its growth and development. Discuss the role of technology in overcoming these constraints.

(Answer in 250 words) 15 Marks

While agriculture's share in GDP is ~18%, ~~with~~ ~ 45% of workforce is still dependent on it. This necessitates productivity growth in the sector.



Constraints

- Small farmholding size (86% < 2 ha)
- Low penetration of tech
- Food crop production dominated by wheat-rice system

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- Dependent on monsoon (more than half of cropped region)
- Challenge of climate change
- Low productivity
- Lack of infra (eg: high post harvest losses)
- Low income
- Market dominated by APMCs
- Soil & water pollution
- Rising cost of inputs in production
- Subsidy burden on govt (eg: fertilisers, power)
- Low efficiency of water use adds to water stress.
- Low yield
- low formal credit

Role of Technology

- eNAM would enable better price discovery
- Precision agriculture would decrease cost of input while increasing yield.
- Weather forecasting can assist in various decisions. (eg: when to sow)
- Biotechnology can produces heat resistant and disease resistant crops

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- Farmer's education via tech (eg: interaction over internet)
- Tech based agri startups are increasing income & productivity (eg: direct to consumer apps)
- ~~Revolutions~~ Innovations in financial sector (eg: DBT for subsidy, UPI, Jan Dhan Account)
- Technology in power & irrigation (eg: solar water pumps)
- Nano-urea to increase efficiency
- Greater export with faster travel and globalisation (eg: vegetables to middle East)

Thus, technology can transform the agricultural sector in various ways.

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Q.14 पर्यावरण एवं प्राकृतिक संसाधनों पर सिंचाई के प्रभाव का मूल्यांकन कीजिए, और कृषि में सिंचाई पद्धतियों की संधारणीयता और समता सुनिश्चित करने के लिए उपाय सुझाएँ। (250 शब्दों में उत्तर दीजिए) 15 अंक

Evaluate the impact of irrigation on the environment and natural resources, and suggest measures to ensure the sustainability and equity of irrigation practices in agriculture.

(Answer in 250 words) 15 Marks

Agriculture accounts for >90% of groundwater usage in India, and its inefficiency is a major problem.

Impact of On Envt & Natural Resources

- Excessive & unscientific irrigation practices lead to degradation of soil (eg: salinisation)
- Submerged irrigation of rice is a major contributor of methane, a greenhouse gas.
- Leads to depletion of water tables, leading to water stress in the region.
- Irrigation via construction of dams and canals lead to many changes like submergence of land, siltation, alteration of rivers course affecting its biodiversity etc.

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- ~~Irrigatig~~ Irrigation using pumps needs electricity, which is mostly generated using coal. This has many implications for envt like global warming.
- Clearing of land for agriculture leads to deforestation, soil erosion etc.

However, agriculture & irrigation provide food security, and when done sustainably, is a win-win for all.

Suggested Measures

- Focus on efficiency (eg: Per Drop More Crop Scheme) via drip / sprinkler irrigation
- Growing crops suitable to the region, instead of water intensive ones like Sugarcane.
- Revival of traditional water harnessig methods (eg: Johad, wells)
- Usig green energy as power source (eg: solar pumps)

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* Deterring nature of soil from Soil Health Cards and determining crops based on result.
* Rain water harvesting to recharge ground aquifers.

Thus, there is great scope of improvement in use of water for irrigation in India.

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Q.15 परमाणु ऊर्जा और अंतरिक्ष प्रौद्योगिकी के क्षेत्र में क्रमशः डॉ. होमी जहाँगीर भाभा और डॉ. विक्रम अंबालाल साराभाई के योगदान से भारत को रणनीतिक रूप से किस प्रकार लाभ हुआ? (250 शब्दों में उत्तर दीजिए) 15 अंक

How India benefitted strategically from the contributions of Dr. Homi Jehangir Bhabha and Dr. Vikram Ambalal Sarabhai in the fields of atomic energy and space technology respectively?
(Answer in 250 words) 15 Marks

Dr Bhabha & Dr. Sarabhai were visionaries, and their long term thinking despite constraints of funds provided the foundation on which India's mighto stands today in the world.

Dr Bhabha & Atomic Energy

- Dr Bhabha envisioned the use of atomic energy, both as energy source and as deterrent weapon, soon after independence. He insisted the then PM Nehru to set up an R&D for this purpose.

- Dept. of Atomic Energy owes its existence to Dr Bhabha.

- He also collaborated with USSR to further atomic research in India.

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- He set up a capable team to carry his vision forward.
- The 1962 border conflict with China made the requirement of nuclear weapon clear to India as a deterrent. This was further solidified by US' threat in 1971 Bdesh war.

Thus, if India today is recognised as a responsible nuclear power, Dr Bhabha deserves a large share of that credit.

Dr Vikram Sarabhai & Space Tech

- Dr Vikram Sarabhai also willed India's non-existent space sector into existence owing to his long term vision.
- He helped set up INCOSPAR, which later formed into ISRO into 1960s.
- He gathered a team of able men from across India (eg: APJ Kalam).

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* He also collaborated with USSR, and India's first satellite, Aryabhatta, was launched from a USSR rocket in 1975.

* Seeing the resistance in tech transfer from both US & USSR, he embarked on a mission to indigenise tech, a vision realised later.

* Space tech also strengthened India's military prowess via indigenous missiles like Agni & Prithvi.

Thus, both these visionaries played a very important role in ~~na~~ progressing India's tech dreams.

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Q.16 जेनरेटिव एआई निकट भविष्य में नवाचार की सीमाओं को आगे बढ़ाने का सामर्थ्य रखता है, फिर भी इसका सामाजिक प्रभाव पर्याप्त चुनौतियाँ खड़ी करता है। सविस्तार उत्तर दीजिए। (250 शब्दों में उत्तर दीजिए) 15 अंक

Genreative AI holds the potential to push the boundaries of innovation in the near future, yet its societal impact raises substantial challenges. Elaborate. (Answer in 250 words) 15 Marks

Generative AI (eg: chatGPT, Bard) is application of AI to generate prompt-based content like QnA, images, poems, emails etc.

Generative AI & Innovation

- Generative AI has produced creative content like images, poems, stories, journalistic articles etc at par with humans. A lot of low to medium level jobs in such sectors can be arguably automated (eg: advertisement for brands)

- Generative AI has huge applications in education, since it's able to analyse content and give answers like teachers. Students too can use it for many purposes, incluing completing homeworks.

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* It is also able to do seemingly tough tasks, like coding, pointing out bugs in code, checking code for flaws etc.

* The main distinguishing feature of generative AI is its ability to correct itself when pointed out, and continuous learning from the user-generated data. Mankind's collective information and wisdom is potentially residing in generative AI.

* It can also assist in R&D, like vaccine development and more. Any intelligent question framed at it gives an acceptable starting point to work with.

Societal Impact & Challenges

* Access to such tech requires education & other resources. Thus, it can further widen inequality (eg: rural vs urban student)

* Bias in data can be perpetuated. Though measures have been taken, the system is far from fool-proof (eg: racist replies).

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- Threat to significant no. of jobs (eg: AI chatbots) in customer service
- Reskilling of workforce is required to use AI as a tool for productivity enhancement.
- Dominated in English language, thus other language speakers are at disadvantage.
- Trained from internet based website data, thus western world view is default.
- ~~Threat of Generative AI~~
- Plagiarism becoming tough to detect.
- Question of benefit sharing to original dataset creators (eg: artists)

Thus, Generative AI & its regulation is a major policy issue across countries of the world.

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Q.17 नवंबर 2022 में मिस्र में COP27 संयुक्त राष्ट्र जलवायु परिवर्तन सम्मेलन में लॉन्च किये गए "जलवायु के लिए मैंग्रोव गठबंधन" के उद्देश्य को स्पष्ट कीजिए। उष्णकटिबंधीय देशों की तटीय पारिस्थितिकी को बनाए रखने में मैंग्रोव के महत्त्व पर विस्तार से प्रकाश डालिए।

(250 शब्दों में उत्तर दीजिए) 15 अंक

Explain the purpose of the "Mangrove Alliance for Climate" launched at the COP27 UN Climate Change Conference in Egypt in November 2022. Elaborate on the importance of mangroves in maintaining the coastal ecology of tropical nations.

(Answer in 250 words) 15 Marks

MAC

MAC, launched at CoP27 is targeted towards restration of magroves because of its multifaceted benefits. It was launched by UAE.

Purpose

- To restore magroves, esp along coasts, to check against waves and prevent soil erosion.
- Mobilisation of funds to assist developing Countries in this regard.
- To increase awareness about importance of magroves.
- Involving civil Society and NGOs working in this area.
- To collect data wrt magroves for better information and awareness generation.
- Investing in R&D on how to preserve magroves better.

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- Involving local community for sustainable use of mangroves.
- To aid in absorption of GHGs via mangroves.

Mangroves & Coastal Ecology

- Mangroves acts as natural barriers against storms and waves, mitigating their impact.
- They also break high speed winds, dissipating their destructive energy.
- They support niche flora and fauna, Contributing to biodiversity.
- They provide ecological services like purification of water seeping into ground, nutrient recycling etc.
- They prevent soil ~~erosion~~ erosion by binding soil (eg: check sea water intrusion).
- They sequester carbon.
- They provide various products like fruits, bamboo, fish, etc

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- Encourage tourism.
- Lower temperature
- Regulate rainfall in the region
- Maintain earth's heat budget

Thus, as evident, mangroves provide a host of services to coastal ecology, and need to be preserved for a healthy ecosystem.

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Q.18 आपदा प्रतिरोधी बुनियादी ढाँचे के लिए गठबंधन का गठन भारत में आपदा प्रबंधन दृष्टिकोण को और अधिक मजबूती प्रदान करता है। टिप्पणी कीजिए। भारत में आपदाओं से निपटने के लिए एक नई रणनीति की आवश्यकता के औचित्य सिद्ध कीजिए।

(250 शब्दों में उत्तर दीजिए) 15 अंक

CDRI

The Formation of the Coalition for Disaster Resilient Infrastructure brings more robustness to the Disaster Management approach in India. Comment and justify the need for a new strategy to tackle Disasters in India.

(Answer in 250 words) 15 Marks

CDRI, launched by India, aims at creating disaster-proof infra to save lives and other resources.

CDRI & ~~Dist.~~ Disaster Mangement (DM)

* India, being a highly vulnerable country to various disasters, needs preparedness and mitigation in its DM approach. It is in this context that CDRI was launched.

* It also cements India's global leadership in climate change crisis.

* It focuses on creating synergies across govts by enabling transfer of tech (eg: earthquake resistant practices from Japan).

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- It changes attitude from reactive to proactive in DM.
- It also pays attention to local knowledge in tackling disasters since they are the direct stakeholders, and hold knowledge generated over centuries (eg: flood mngement)

Tackling Disasters In India

- India is prone to a host of disasters, including earthquakes, floods, droughts, cyclone, cloudbursts, landslides, GLOFs, tsunami
- Thus a holistic approach is required, from preparedness to mitigation → response → relief → rehabilitation

- NDMA 2005 gives rise to 3 tiered structures for DM, at centre, state & district level.
- Nat'l Disaster Response Force is also constituted under it, a highly skilled force for relief in various scenarios.

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✓ Nat'l Disaster Relief / Mitigation Fund to deal with various contingencies.

✓ New strategy like using tech (sensors, radars), early warning systems, involving local community, meeting Paris Agreement targets, afforestation, sustainable agriculture, green energy (hydrogen, solar etc), strengthening decentralised governance, R&D, collecting data, creating zone maps etc are required to deal with new problems like Joshimath land subsidence and covid.

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Q.19 महत्त्वपूर्ण बुनियादी ढाँचे (क्रिटिकल इंफ्रास्ट्रक्चर) और प्रमुख निगमों को लक्षित करने वाले रैंसमवेयर हमलों में हुई हालिया वृद्धि ने मजबूत साइबर सुरक्षा उपायों और नीतियों की तत्काल आवश्यकता पर प्रकाश डाला है। इस प्रवृत्ति में योगदान देने वाले प्रमुख कारकों पर चर्चा करते हुए, विभिन्न क्षेत्रों पर इन हमलों के प्रभाव का विश्लेषण कीजिए।

(250 शब्दों में उत्तर दीजिए) 15 अंक

The recent rise in ransomware attacks targeting critical infrastructure and major corporations has highlighted the urgent need for stronger cybersecurity measures and policies. Discussing the key factors contributing to this trend, analyze the impact of these attacks on various sectors.

(Answer in 250 words) 15 Marks

Ransomware attack entails holding data hostage to extort money or for strategic reasons. Attack on Mumbai power infrastructure is a recent eg of vulnerabilities in critical infrastructure. Globally, WannaCry ransomware attack is another example.

* Ransomware attacks can be for monetary aims or as a strategic part of a country's military capability.

↓ Thus, Stronger measures are required for various reasons.

Key Factors In Increasing Attacks

↓ Lack of awareness among users (eg: clicking unverified links)

↓ Systemic loopholes in hardware or software (eg: zero day attacks) (eg: china based hardware)

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- Increasing sophistication of ways to attack (eg: Pegasus software)

- Lack of regulation from app stores can lead to shady apps masking as authentic ones being installed (eg: scanning loan apps)

- Advent of bitcoin has made it easier to remain untraceable.

- Poor regulation of activities on Dark Web.

- Poor cyber practices by users (eg: setting weak passwords)

- Lack of data regulation bill in India has created vacuum in the policy sphere.

- Use of social media which gives away personal information willingly (eg: place of work)

Impact On Sectors

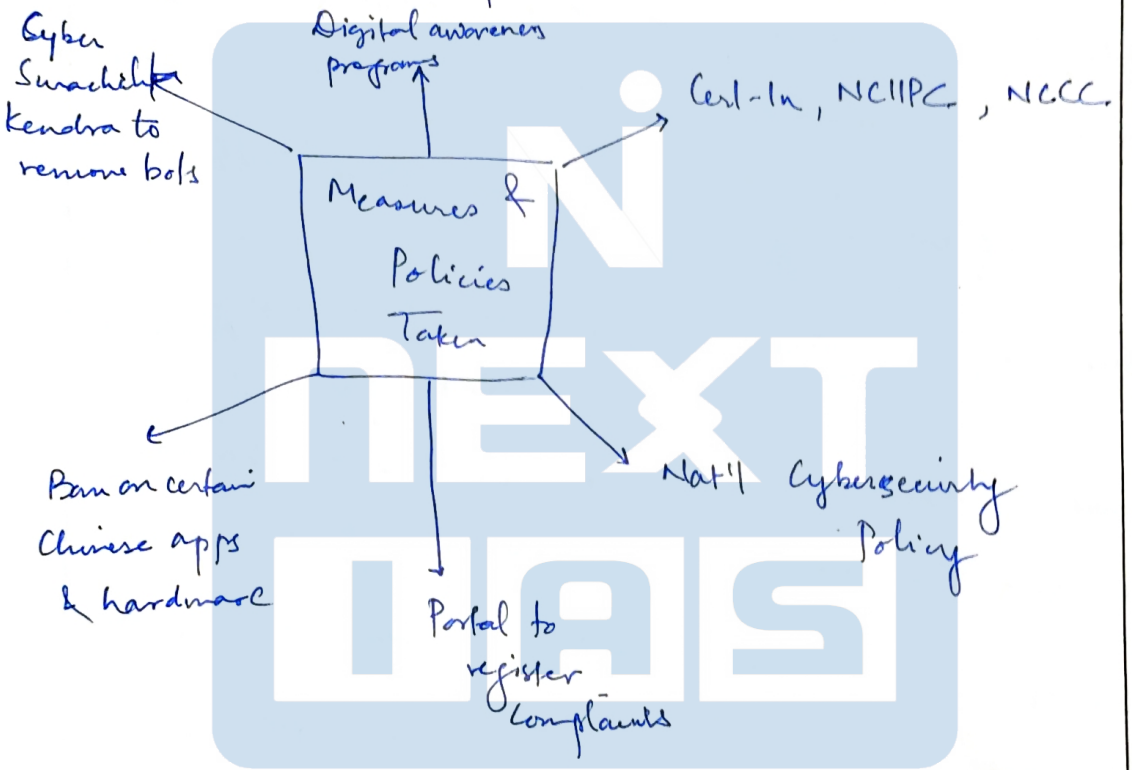
- China based 5G hardware has been banned by many countries, including India.

- Loss of money and crucial data

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* Attacks on govts lowers public trust, breeds an atmosphere of fear.

* Huge potential implication for critical, digital heavy sectors like banking, hospital (eg: attack on AIIMS Delhi), power, railways, nuclear, space and more.



Thus, cybersecurity is an important challenge, closely linked with ambitions of Digital India & e-governance.

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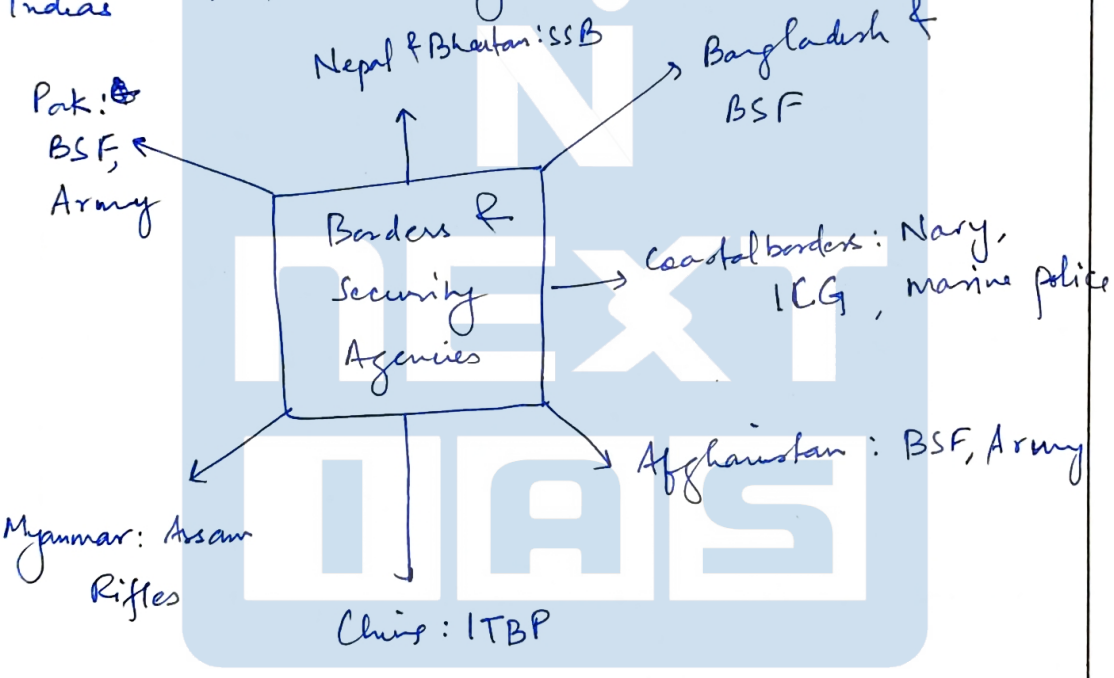
Q.20 सीमा सुरक्षा के संदर्भ में, तटीय और स्थलीय सीमाओं के प्रभावी और कुशल प्रबंधन को सुनिश्चित करने के लिए विभिन्न सुरक्षा एजेंसियों के बीच सहयोग और समन्वय को कैसे बेहतर बनाया जा सकता है?

(250 शब्दों में उत्तर दीजिए) 15 अंक

In the context of border security, how can cooperation and coordination between different security agencies be improved to ensure effective and efficient management of coastal and terrestrial borders?

(Answer in 250 words) 15 Marks

With ~7500 kms of coastal borders, ~15000 km of terrestrial borders and 7 neighbours, India's border security is a complex task.



- Various security agencies are BSF (Border Security Force), ITBP (Indo-Tibetan Border Police), ICG (Indian Coast Guard), SSB (Shastra Seema Bal).

- In the view of different bilateral relations, history, type of terrain etc, specialised forces have been raised.

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* However, coordination b/w them can lead to better management of border areas by removing duplication of efforts and streaming resources & intelligence.

Improving Coordination

* Idea of ITC or Integrated Theatre Command is one such example. If implemented with widebold consultation, it can streamline resources like training and arsenal, while solving the problem of a 2 front war.

* Technological solutions for intelligence sharing can empower all agencies (eg: shared database of suspected criminals & terrorists)

* In coastal borders, coordination b/w Navy and ICG can help check piracy and drug trafficking.

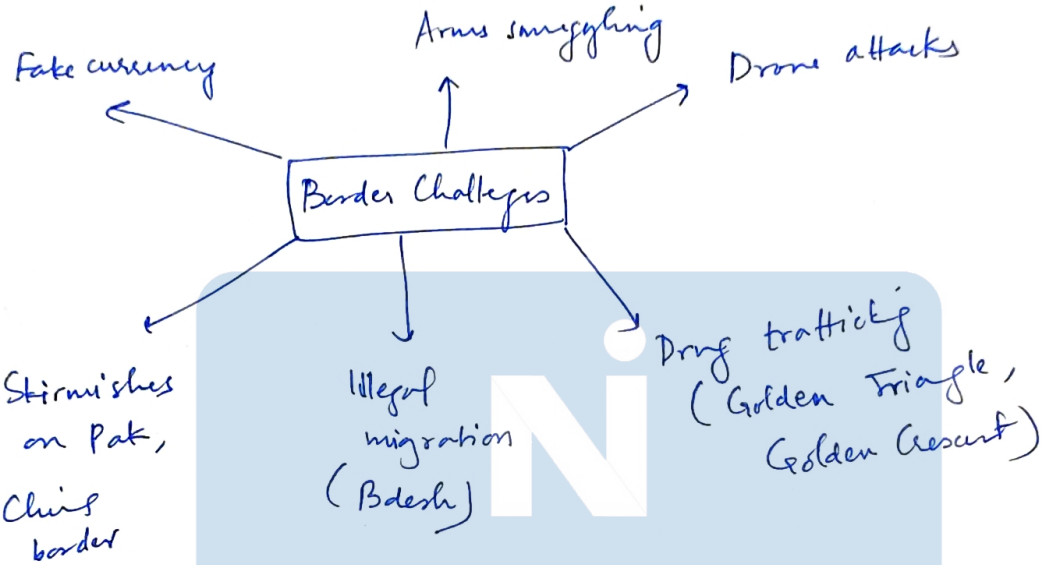
* Schemes like Vibrant Village program can develop infrastructure for faster communication.

* Satellite-based communication can enhance speed w/o compromising security.

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* Co-ordination via Home Ministry (paramilitary under it) and b/w Home Ministry & Defence Ministry for information exchange.



* Many borders have common challenges, and finding a SOP to tackle them can lead to better solutions (eg: drug trafficking is from Pak, Myanmar & coastal areas).