

NEXT IAS

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(To be filled by candidate)

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Roll No. :

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Test - 3

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MTS IGP Batch 2023

GENERAL INSTRUCTIONS

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SUBJECT/PAPER
GENERAL STUDIES

Invigilator's Sign. :



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Evaluator Code :

Q.No	PgNo.	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

MACRO COMMENTS



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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 refers to the additional tax which is levied by the government on entities which have accrued profits without any additional inputs, due to external circumstances.

Eg:- Windfall tax on petroleum when global prices increased due to Russia - Ukraine crisis in 2022.

Effectiveness in Wealth Redistribution

- ① Avoids concentration of profits with only few companies. Article 39(b)(c)
- ② Leads to better revenue for excheques in times of crisis. Eg:-

increasing inflation in 2022.

③ Can be used for social welfare schemes.
Eg:- PM - Garib Kalyan Anna Yojana in crisis.

④ Companies have accrued profit without any input \Rightarrow Moral responsibility to pass it down to society.

Challenges in wealth redistribution

- ① Limited amount generated via windfall tax
- ② Hampers ease of doing business - new businesses might be sceptical.
- ③ Accrued revenue might be used for some other purposes. Eg:- Banks bail-out.

Today bottom 50% in India hold $\sim 3\%$ wealth. (Global Inequality Report 2023) - windfall tax if used appropriately can be a tool for more equitable society.

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

Monetary Policy Framework

Agreement, 2015 led to establishing of Monetary Policy Committee with an aim to keep headline CPI at $4 \pm 2\%$.

Success of MPC

- ① Inflation within tolerance band before pandemic
- ② Although inflation at FY23 was 6.7% , it is much less than global economies like Germany at 17% .
- ③ Balancing growth with inflation has been possible.
- ④ Providing stance like 'Accommodative',

'hawkish', etc. signals businesses in advance who can adjust production factors.

Challenges of MPC

- ① Inflation not solely driven by monetary policy. Eg:- Demand pull inflation in FY23 due to rising oil, fertilizer prices on which MPC has no control.
- ② Lag in control: Rate increase lagged ~3-4 months after Russia-Ukraine start.
- ③ Inherent contradiction: RBI needs to offer ^{low} ~~high~~ rates on G-Sec while keep inflation under control which leads to high rates.

Yesterday (10th August), MPC decided to keep Repo Rate at 6.5% to ensure inflation control with growth.

2.3

भारत में सतत 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

UN has declared 2023 as International Year of Millets which are hardy crops like Bajra, Jowar, Ragi, kodo, kutki, etc.

Promoting Sustainable Agriculture

- ① Low water need: 300-900mm v/s 600-1200 mm for rice.
- ② Low need of fertilizers :- as they can grow in harsh agro-climatic zone.
- ③ Low need of pesticides: due to natural pests resistance.
- ④ Less damage during extreme weather events.

Improving Food Security

- ① Muge production: India largest producer

in the world.

② Nutritional Support: Rich in proteins, Zinc, Magnesium, Iron → Help in eliminating Anaemia by 2047 goal.

③ Can tackle Non-Communicable Diseases like diabetes, cardiac issues.

④ Cheaper as compared to wheat/rice in open market ⇒ poor can afford

Issues

① Low productivity: ~ 1/2 of wheat/rice.

② Low income to farmers: - AS MSP only for Bajra, Jowar, Ragi.

③ Low procurement by government: Only ~10LT out of ~200LT produced.

India needs to setup quality seed banks, provide finance like Carbon credit & setup market to ensure millets lead to food security & sustainable agriculture.

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)

seeks to provide Functional Tapwater House Connection to every household by 2024.

Significance of Mission

- ① Regional Disparity :- States like Telangana have ~100% tap connections v/s Bihar, Jharkhand are at ~50%.
- ② Improving nutritional standards :- Avoiding diseases like Cholera, diarrhoea in children.
- ③ Saving of woman's time :- in fetching water → possibility of increasing Female LFPR.
- ④ Reducing health expenses, improving productivity of workforce, etc.
- ⑤ Proper sewage disposal.

Impediments in Mission

- ① Slow progress:- Only 72% of target achieved till now.
- ② Global shocks:- Like Russia-Ukraine, Pandemic, etc. delayed construction due to low steel availability.
- ③ Quality of water:- Polluted water from taps was reported in West Bengal.
- ④ Quantity of water:- Far less than envisioned 55 litres per person per day.
- ⑤ Pani Samitis:- Not effective enough due to low capacity building.

Clean Water & Sanitation

(SDG 6) can be India's stepping stone to improving socio-economic condition. It needs to speed up construction via MGNREGA, ensure quality of water with adequate quantity.

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

Battery Energy Storage Systems

(BESS) are tools which can store energy in them for long time. Eg:- Li-ion batteries, Aluminium-Air batteries, Li-Sulfur batteries

Application of BESS

- ① Storing renewables:- Estimated capacity of 125 GW of storage for India's 2070 goal of 50% electricity from renewables
- ② Decarbonizing industries:- Electric furnace, boilers, etc. can be powered by BESS.
- ③ Electric vehicles:- Use BESS as power source.
- ④ Green hydrogen:- Electricity produced from electrolyzer need BESS.
- ⑤ New age devices:- Data centres, wearable smartwatch, goggles, etc.

Revolutionize India's Energy Programme

- ① Help in integrating renewables:- by reducing variability in their supply.
- ② Producing green hydrogen:- Can be done by BESS charged via renewables.
- ③ Ensuring 24x7 power supply:- by small scale BESS in rural areas.
- ④ Storing hydroelectricity generated during excess rain / flood

Challenges

- ① Processing of Lithium - 70% done by China.
- ② Expensive as compared to coal electricity.

- India's recent discovery of 5.9 million tonnes of Lithium in Reasi (J&K) & budget announcement of supporting BESS of 4000 MWh can ensure sustainable energy transition (SDG 7) along with envisioned economic growth.

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 is a crewed mission which seeks to demonstrate India's capability of sending humans to Low Earth Orbit (LEO). It is expected to be launched in 2024.

Developments in Gaganyaan

- ① Testing of re-entry of capsule (without crew) done successfully.
- ② Industry collaboration:- More than 50 private players involved.
- ③ Global collaboration:- ISRO - France working together for next stage testing.

Challenges in the Mission

- ① Delay:- Already delayed by a year.

- ② Budget constraints:- ISRO's relatively low budget of Rs 14,000 Cr.
- ③ Success in 1st flight:- Must as it is a crewed mission.

Benefits for Society

- ① Global stature:- OF India increases \Rightarrow Better opportunities for students, businesses.
- ② Job generation:- $\sim 60,000$ created.
- ③ Scientific Temper:- Improves among society which is also mentioned under Article 51A.
- ④ Innovation:- Startups like Dhruva, Agnikool, Skyroot emerge.

India has rightly formulated New Space Policy 2023 which will enable participation of more private players leading to more such missions in future.

“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.

(Answer in 150 words) 10 Marks

Green hydrogen is hydrogen which is produced from renewable energy. India's Rs 19,700 cr National Green Hydrogen Mission targets producing 5 mmt green hydrogen by 2030.

Green Hydrogen to Tackle Climate Change & Pollution

- ① Clean fuel :- Emission of Fuel Cell car is pure water which can be drunk.
- ② Decarbonize long haul transportation:- like trucking, shipping due to low refuel time
- ③ Decarbonizing polluting industries like Steel, Fertilizers which use grey hydrogen
- ④ Energy density is 2.2x of gasoline \Rightarrow lesser fuel needed for same work.

- 5) Can act as renewable storage :- Expected to store ~ 125 GW of renewable.

India's Green Hydrogen Mission

- 1) Strategic Intervention on Green Hydrogen & Transition (SIGHT) aims to:

- > Develop pilot projects & use cases.
- > Create mandates in industry, transportation.

- 2) Strategic Hydrogen Innovation Partnership (SHIP) :- promotes R&D collaboration.

What More IS Needed

- 1) Developing skillsets, labour force by introducing courses in IITs.

- 2) Developing SHAETI distribution infra via PM GATI

Green Hydrogen has potential to make India Energy Independent as envisioned by the Prime Minister.

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

In 2023, Joshimath witnessed
Land subsidence of 5.4 cm in 12 days
leading to evacuation of 600 households

Lessons for Environmental Conservation

- ① Study of land before construction: Joshimath built on loose deposits brought by landslides
- ② Ensuring slope stability: - Use terrace cutting instead of vertical cutting for roads.
- ③ Delineating no go spaces: - Above Main Central Thrust (Chopra Committee).
- ④ Reducing felling of trees: - which loosens Soil (MC Gupta Committee).
- ⑤ Ensuring no seepage of water: - in slopes due to cities, hydroprojects, etc.

Lessons for Disaster Management

- ① Improving monitoring :- To improve lead time of reaction.
- ② Establishing safe shelters :- Lacking in case of Joshimath.
- ③ Developing rescue SOPs in case of connectivity damage like Chamoli disaster.
- ④ Reducing risk :- Disaster resilient infra. Eg:- karkuni houses of Himachal.
- ⑤ Developing local capacity :- to identify disasters, ensure evacuation, regular mock drills, etc.

In light of increasing disasters, India has rightly initiated Working Group in G20 on Disaster Risk Reduction.

"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 attack on police station in Punjab to release Amritpal Singh & subsequent protest in Canada show Khalistan issue is still impending.

Recent Development in Khalistan Issue

- ① Amritpal Singh taking over as head of Waris De group which demands Khalistan.
- ② Vandalism of Indian Embassy in UK.
- ③ Calls for referendum in Australia, Canada.

Measures to Handle It

- ① Socio-economic development of Punjab:-
Setting up ITIs, higher education

institutes to educate youth.

- ② Breaking drug linkages :- Via active local rehabilitation efforts.
- ③ Control of weapons :- ~~to~~ Avoiding smuggling from Pakistan by deploying Smart Borders.
- ④ Local Intelligence Network :- Similar to C60, Bastaniya Battalion used for naxalism.
- ⑤ Global actions :- India can pressurize UK, Canada to break global support & funding for khalistan.
- ⑥ Multi-Agency Coordination :- IB, R&W, Army, Local Police for improved intelligence.

India will have to combine Carrot (socio-economic development) & stick (combat) approach to uproot the khalistan issue.

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

Drones are unmanned aerial vehicles which can fly across borders ~~with~~ & carry attacks, weapons, etc. It is a new threat to India's security.

Challenge Posed By Drones

- ① Anonymity :- Drones once programmed doesn't need guidance
- ② Attacks on gated infrastructure :- Airforce base in J&K in 2022.
- ③ Cannot be detected by radar :- As they fly at low heights.
- ④ Relatively easy to assemble - can be done by not-so-skilled terrorists.
- ⑤ Can carry out Intelligence, Surveillance, Reconnaissance (ISR) activities.

Tackling Drone Problem In India

- ① Developing detection system like DRDO's D-4 system
- ② Local intelligence :- Training locals in identifying enemy drones.
- ③ Equipping defence forces :- Gun mounted drone killers needs to be developed.
- ④ Mobile soft-kill equipment :- Jammers, misguiding signals needs to be developed.
- ⑤ Acquiring counter drones :- Like MQ-9A, TAPAS, etc. for counter-ISR activities.

India has liberalized Drone Policy to encourage startups in this sector who can augment India's security by providing the needed hardware.

विद्युत संशोधन विधेयक, 2022 उपभोक्ताओं, डिस्कॉम के साथ-साथ पर्यावरण के लिए कई लाभ प्रस्तुत करता है। सविस्तर 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

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

Electricity Amendment Bill,

2022 seeks to revamp electricity sector to reduce DISCOM debt (₹RS 6 L cr), provide 24x7 electricity to consumers.

Advantages for Consumers

- ① Option to choose from multiple private DISCOMs.
- ② Effective grievance redressal by empowering CERC, SERC.
- ③ Better planning of electricity use by time of day pricing signals.

Advantages for DISCOMS

① Involving private agencies \Rightarrow improved efficiency. Eg:- Delhi's AT&C losses reduced by 50% after private player involvement.

② Increased smart metering \Rightarrow lesser theft losses

Advantages for Environment

① Mandate to include certain percentage of electricity from renewables -

② Stricter penalties for violating RPOs (Renewable Purchase Obligations).

③ Provides for expansion of Green Corridors for equitable distribution of green electricity.

Challenges Remain

- ① Doesn't solve the legacy debt with DISCOMS ~ Rs 6 L Cr.
- ② Infrastructure for integrating renewables still lacking.
- ③ Thefts prevalent in rural areas still not tackled effectively.

Way Ahead

- ① Revamping infra: Capacitor based transformer, closing down low efficiency thermal plants to ensure lesser variable cost.
- ② Encouraging startups in local storage solution, grid synchronization, etc.
- ③ Moving to Market Based Economic Dispatch model

Access to energy will be a Singha-nan for India's target of developed country by 2047.

भारतीय प्रतिभूति एवं विनियम बोर्ड (सेबी) शेयर बाजार के नियमन और निवेशकों के हितों की सुरक्षा में महत्वपूर्ण 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

Securities & Exchange Board

(SEBI) is a statutory organisation which regulates share markets in India. Its

functions are:

- ① Regulating corporates, stock exchanges, clearing corporations, etc.
- ② Protecting investor interests via ensuring disclosures of information by companies
- ③ Investigating allegations / mal-practices
Eg:- SEBI panel for Adani short selling incident.

Challenges Faced by SEBI

- ① Volume: Ever growing share market,

IPOs, etc. with start-up boom in India.

② Round-tripping:- Money routed through Shell Companies making it difficult for SEBI to find ultimate Beneficial Owner.
Eg:- Adani case.

③ External Shocks:- SEBI cannot always protect ~~an~~ investor interest. Eg:- FPI outflow due to Fed Rate rise in FY23 led to drop in stock markets.

④ Cryptocurrencies: 1.5 million trade in crypto which is outside of SEBI purview.

⑤ Corporate Governance Lapses:- Like Kingfisher, PNB scam, etc. which threatens investor interest but cannot be controlled by SEBI alone.

Way Ahead

- ① Reorganizing SEBI: Separate divisions for startups, blue-chip companies for efficiency.
- ② Inter-government Group: Across RBI, SEBI, Ministry of Corporate Affairs, etc. to ensure borrowing, corporate governance as per regulations.
- ③ International Coordination: Information sharing agreements between global exchange boards to avoid round-tripping.
- ④ Enhanced investor outreach: via smartphones, monthly newsletters to educate them on new opportunities, market risks, etc.

SEBI has potential to mobilize savings of average Indian household & channelize it for India's growth story.

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

Agriculture sector in FY 23

contributed $\sim 20\%$ to GVA breaching

the $\sim 18\%$ mark after a decade. It was

also the ONLY sector which showed growth during pandemic.

Constraints to Indian Agriculture

① Fragmented holding :- 86% farmers hold $< 2\text{Ha}$ \Rightarrow subsistence farming.

② Low R&D :- Agriculture subsidies at $\sim 2.5\text{ Lakh Cr}$ while R&D budget at $\text{RS } 3-4,000\text{ Cr}$.

③ Primary techniques :- Only 56% farms are mechanized in India.

- ④ Rainfed :- Irrigation at only 52% of Net Sown Area.
- ⑤ Poor marketing avenues :- Heavy dependence on APMCs, distress sale (Onion in 2023), etc. leads to poor price discovery.
- ⑥ Lack of diversification :- Heavy reliance on few crops like wheat, rice, sugarcane, etc.

Technology as a Solution

- ① Weather prediction :- Quantum computing can provide early prediction of extreme weather events.
- ② Nano-urea :- Reduce dissolution rate, reduced cost, better soil quality.
- ③ Precision farming :- Sensor based irrigation precisely to roots \Rightarrow saving of water.
- ④ Genetic engineering :- Increased yield.

Eg:- 2.5 - 3 tonnes/ha v/s 1.2 tonnes/ha
for DMH-11 mustard v/s normal.

- 5) Sharing best practices :- Maharashtra farmers use Clubhouse app to discuss marketing.
- 6) Online markets :- e-Nam, etc. can lead to better price discovery.
- 7) Cold-storage :- Reduce post harvest loss currently at Rs 1 Lcr.
- 8) Food processing :- Irradiation, processing
⇒ Better shelf-life, better prices.

Key Watchouts

- 1) Technology divide :- Smartphone penetration 33.1. less in rural areas.
- 2) Lab to farm gaps :- Low number of on-farm testing labs.

However, technology can ensure twin goals of doubling farmer's income along with sustainable agriculture.

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

Irrigation is the process of providing water to agriculture fields artificially. Eg.- Canals, tanks, drip irrigation. In India, 52.1% of Net Sown Area is irrigated.

Impact of Irrigation on Environment

- ① Disturbing natural rivers flow. Eg:-
Ken Betwa project
- ② Excessive water use :- Drying of aquifers in Punjab, Haryana post Green-Revolution.
- ③ Crops not grown according to agro-climatic zones. Eg:- Rice in Punjab needs 3x more water than rice in Bihar,

West Bengal, etc.

④ Eutrophication :- Excessive irrigation \Rightarrow
excessive nutrition runoff \Rightarrow eutrophication.

⑤ Flooding method of rice production one
of major contributor of Green House
Gas in India.

Measures Needed

① Participatory Irrigation Management :-
Local councils to decide irrigation duration,
timings, fees, etc. Eg:- Warabandi in
Maharashtra.

② Rain Water Harvesting :- Using traditional
structures like Ahar Pyne, Phad, etc. to
reduce reliance of irrigation on rivers,
rain, etc.

③ Precision agriculture :- Using of drip
irrigation. Fertigation to reduce water

usage.

④ Recycling of water:- Linking peri-urban-rural areas to use recycled water for irrigation.

⑤ Shifting to hardy crops / horticulture

⑥ Developing aquaponics which reduces need for water as fishes clean the water continuously.

⑦ New cultivation methods like Direct Seeding of Rice to reduce need of irrigation.

Ralegaon Siddhi & Hiware

Bazar in Maharashtra used natural irrigation methods via watershed planning & have become richest villages in India.

2.15

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. Homi Jehangir Bhabha

& Dr. Vikram Ambalal Sarabhai were the

pioneers in India's scientific journey which has placed India among top 5 nations (GDP) today.

Contribution of Dr. H.J. Bhabha

- ① Setting up of Dept. of Atomic Energy which started work on nuclear energy
- ② Developing indigenous 3-stage Pressurized Heavy water Reactor which:
 - (i) Can run on locally available fuel i.e. Thorium.
 - (ii) Could be manufactured by Russian support as US declined to help in India's nuclear program.

- ③ Oversaw the development of India's nuclear weapon programme.
- ④ Helped formulate policies to set-up nuclear plants in ≈ 10 places.
- ⑤ Guided exploration of radio-active materials like Uranium, Thorium in India.

Contribution of Vikram Sarabhai

- ① Established the department of space & started India's space programme.
- ② Chief architect of India's first launch vehicle tested in 1977.
- ③ Collaborated with foreign space organisations to obtain new age technology like solid boosters, cryogenics, etc.

④ Developed Satellites which can be used
by India for:-

- (i) Strategic communication like army.
- (ii) Remote sensing, earth observation, etc.

⑤ Guided prodigies like Abdul kalam,
Nambi Narayan who carried on Indian
space programme even after him.

Today, India rightly pays
tribute to these scientific pioneers like
1st private launch vehicle by Skyroot
was named Vikram-S & every year

Homi Bhabha science examination is
conducted to invoke scientific temper
in students.

Q.16 जेनेरेटिव 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।

Generative AI holds the potential to push the boundaries of innovation in the near future, yet its societal impact raises substantial challenges. Elaborate.

(250 शब्दों में उत्तर दीजिए) 15 अंक

(Answer in 250 words) 15 Marks

Candidates must not write on this margin

Generative AI refers to tools which are capable of generating images, texts, audios, etc. based on pre-trained datasets. Eg:- ChatGPT, Bard, etc.

Push Innovation Boundaries

- ① Simplifying governance:- MeITY planning to integrate ChatGPT with whatsapp where users can ask about any scheme in 12 regional languages.
- ② Improve productivity:- of existing jobs. Eg:- ~5000 call centre employees in Phillipines recorded 14% productivity increase with GenAI (MIT Study).

- ③ Make knowledge accessible :- By explaining in easy to understand terms.
- ④ Generate beyond human imagination :- Eg:-
Dall-E website generating images like 'Cat sitting in spoon solving Heisenberg's equation'.
- ⑤ Improve usability of tools :- Google Lens, Photoshop, etc. where user can just ask questions to get guidance.

Substantial Challenges

- ① Job loss :- 300 million expected by 2030 (Goldman Sachs).
- ② Inhibition of critical thinking :- Students using ChatGPT to complete homework.
- ③ Algorithmic biases :- LinkedIn's AI showed lesser color women as job prospects as it had lesser data on them.

- ④ Data privacy:- Companies collecting more & more data to feed AI.
- ⑤ Lack of human depth:- In understanding complex situations.
- ⑥ Digital divide:- Can be exacerbated as rural areas fall behind in adoption.
- ⑦ Global monopolies:- It is expected that 1st 3-4 companies in GenAI will rule the domain for next 30 years.

What is Needed -

- ① Data Protection Law to ensure privacy.
 - ② User education of proper use right from school level.
 - ③ Upskilling of workforce.
- "Technology by itself is amoral
It is humans who make it moral
or immoral".

2.17 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

Mangrove Alliance for Climate

(MAC) was launched at Sharm-El-Sheikh

in 2022. India has joined the alliance considering it has one of the largest mangroves in the world. Eg:- Sundarbans

Purpose of MAC

- ① Develop & share best practices for Mangrove conservation.
- ② Funding for restoration, development of mangroves.
- ③ Transboundary cooperation in conserving mangroves.
- ④ Undertaking study to understand potential

of mangroves to reduce impact of climate change.

Role of Mangroves in Coastal Ecology

- ① Biodiversity :- Mangroves support niche species - both marine & terrestrial.
- ② Economic :- One of the most fertile fishing grounds.
- ③ Disasters :- Act as natural break for tsunamis, cyclones, etc.
- ④ Carbon sequestration :- Potential is 3-5x of terrestrial forest.
- ⑤ Tourism :- Being biodiversity hotspot, promote tourism. Eg:- Thane Creek Sanctuary.
- ⑥ Natural kidneys :- Filter sewage wastes from cities. Eg:- East Kolkata Wetland.

Issues Today

- ① Encroachments due to increasing population, urbanisation.
- ② Destruction for strategic projects. Eg:-
Navi-Mumbai mangroves destroyed for new airport.
- ③ Water pollution, oil spills, etc. can kill mangroves.

Way Ahead

- ① Community led restoration & conservation.
- ② Converging schemes. Eg:- MISHTI converges CAMPA & MGNREGA.

India is rightly moving towards mangrove conservation via new schemes like MISHTI, Amrit Dharovar, 75 Ramsar sites, etc.

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

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

India is 3rd most affected

country globally due to disasters —
Global Climate Risk Index by Germanwatch.

In this light, India established Coalition for Disaster Resilient Infrastructure (CDRI)

Bringing Robustness in Disaster Management

- ① Global collaboration → Best practices can be shared.
- ② Provides for technical knowledge, funding & capacity building of member states.
- ③ 75% of infrastructure in Global South yet to be made → potential to incorporate disaster resilience.

Need for New Strategy in India

- ① Increasing disasters:- Cyclones in Arabian Sea increased by 50% in last decade.
- ② Spatial variation:- Floods in Himachal, Delhi while scarcity in Odisha, Jharkhand.
- ③ Increased extreme weather events:-
800 million people affected in 2022.
out of which 94% in Asia - Africa.
- ④ Increasing population \Rightarrow closer to disasters.
Eg:- 3 Cr people expected to be displaced
by from India's coastal cities by 2050.

The New Strategy

- ① Improving Early Warning System: Quantum Computing for weather prediction accuracy, bathymetric study to analyze oceanic patterns.

- ② Local capacity building:- Forming whatsapp groups, institutional structures for quick response.
- ③ Revisiting traditional approaches:- Eg:-
kathkuni houses (Himachal) which were earthquake proofs.
- ④ New financing means:- Eg:- Disaster Risk Reduction Bonds, Carbon credits, etc.
- ⑤ Encouraging startups in construction to innovate for disaster resilient infra for schemes like PM-Awas Yojana.
- ⑥ Developing framework to undertake economical, social (girls, lower caste) in physical, etc. vulnerability assessment.

India lost \$80 bn to disasters in last 20 years. Multi-pronged new strategy can ensure reduction in impact of ever increasing climate change events.

219 महत्वपूर्ण बुनियादी ढाँचे (क्रिटिकल इन्फ्रास्ट्रक्चर) 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

Attack on AIIMS in 2022

leading to holding of medical database of 3-4 Cr Indians for ransom has thrown light on the increasing vulnerability of critical infrastructure.

Key factors for Increasing Attacks

- ① Data as new oil with everything going digital.
- ② Easy to attack — just need computer & internet connection
- ③ Difficult to trace, locate :- Attackers in remote location or in foreign countries
Eg. — Jamtara.

- ④ Low defense currently:- Relatively low level of awareness, low tools for cyber security.
- ⑤ Highly remunerative for attackers:- Cyber attacks costed world \$6 trillion in 2022.

Impact on Various Sectors

- ① Power sector:- Attack of Chinese firm 'Red Echo' on Mumbai power grid in 2020.
- ② Nuclear reactors:- Kundankulam reactor was attacked which can lead to nuclear disaster.
- ③ Corporates:- Leaking of Dominos, Air India customers database.
- ④ Government records:- Telegram bot giving details of CoWin vaccinated citizens.
- ⑤ Democracy:- US claiming Russia meddled in 2016 elections.

⑥ Common people:- 50% yoy increase
in banking frauds.

Way Ahead.

- ① Developing cyber-security infra:-
> Defense-in-Depth system providing
multiple layers of protection.
- ② Establishing team of ethical hackers
to counter threats
- ③ Mandating cyber audits, regular disclosures.
- ④ Capacity building of general public
& employees.

India should also take up
discussions on Budapest Convention on
cybercrime in upcoming G20 meeting to
develop global coordination.

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

Border security refers to guarding of borders for illegal migration, smuggling, etc. In India, it is done by flurry of agencies as shown:-

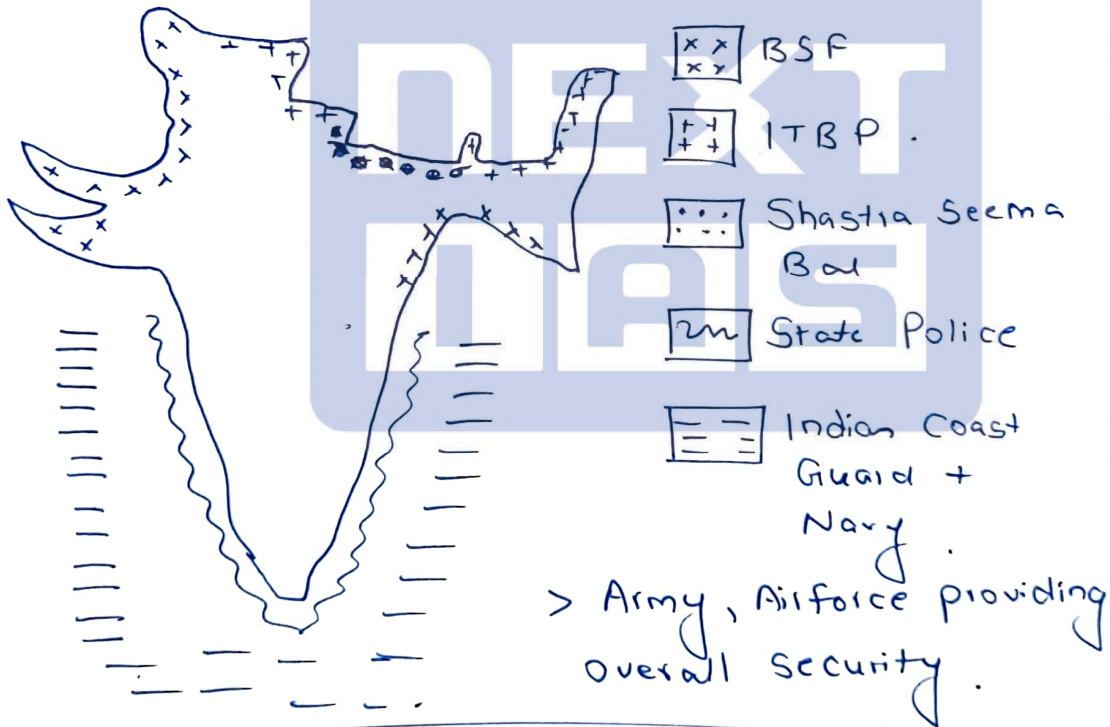


Fig 1. Border Security Forces

Considering the increasing ways

of attack like lone-wolf, drones, etc, there is need for enhanced cooperation between border forces.

Improving Cooperation — Terrestrial

- ① Overarching bodies:- Including members of local police, BSF, etc. to discuss threats
- ② Developing Border Wise Strategy:- Delineating first responders, jurisdiction, etc. clearly.
- ③ Improving international cooperation:- Eg:- Assam Rifles — Tatmadaw (Myanmar) joint operation against North East Insurgents.
- ④ Intelligence flow:- Setting up chain. Eg:- Police giving local intelligence, border forces providing information on border movements.
- ⑤ Better promotional avenues for ITBP, BSF, etc. which are headed by IPS creating clashes.

Improving Cooperation - Coastal

- ① Providing necessary equipment:- State coastal policy ill-equipped - can't complement Coast Guard. (ICG)
- ② Integrating ICG/police within Navy's Information Fusion Centre for seamless intelligence flow.
- ③ Inter deputation at offices level to understand working of other organisations.
- ④ Integrating locals via Village Defence Councils, fishermen community acting as eyes & ears, etc.

Integrated approach will help India effectively tackle new age threats & further its credentials of being a strong defence force.