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(To be filled by candidate)

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Test - 3

Time taken : 3 Hours 18 Minutes

Code : TC073

MTS IGP Batch 2023

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SUBJECT/PAPER
GENERAL STUDIES

Invigilator's Sign. :



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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

MACRO COMMENTS



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3. Write legibly and neatly. Do not write in bad/illegible handwritings.
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5. If you wish to cancel any work, draw your pen through it or write "Cancelled" across it, otherwise it may be evaluated.
6. Handover your QCA Booklet personally to the invigilator before leaving the examination hall.

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 refers to tax imposed by government on enterprises which earn supernormal profits due to uncertainties like war, supply shocks etc

In aftermath of Ukraine conflict, windfall tax was imposed on oil companies in India and Europe. It is a kind of progressive taxation.

Need for windfall taxes

- ① to reduce excess profit generation by companies
- ② to maintain balance in economic operations.
- ③ to increase government revenue which have taken a hit due to COVID-19 & Ukraine conflict.
- ④ it minimises wealth inequality.

How government can use windfall taxes?

- ① to fund its welfare objectives eg) MGNREGA, fertilisers subsidies, food security mission etc.

It helps in giving economic comfort to common citizens and reduce price burden

eg.) oil price & rise, fertiliser price rise etc.

(b) Through Redistributive justice policy it can take up capex to fund infrastructure growth. eg) development of highways, railways, godowns etc.

(c) It minimizes inequality of wealth. As per Oxfam 2019 report, 10% hold 77% of India's wealth

(d) it also gives enough Monetary policy comfort to RBI to tackle inflation and promote growth.

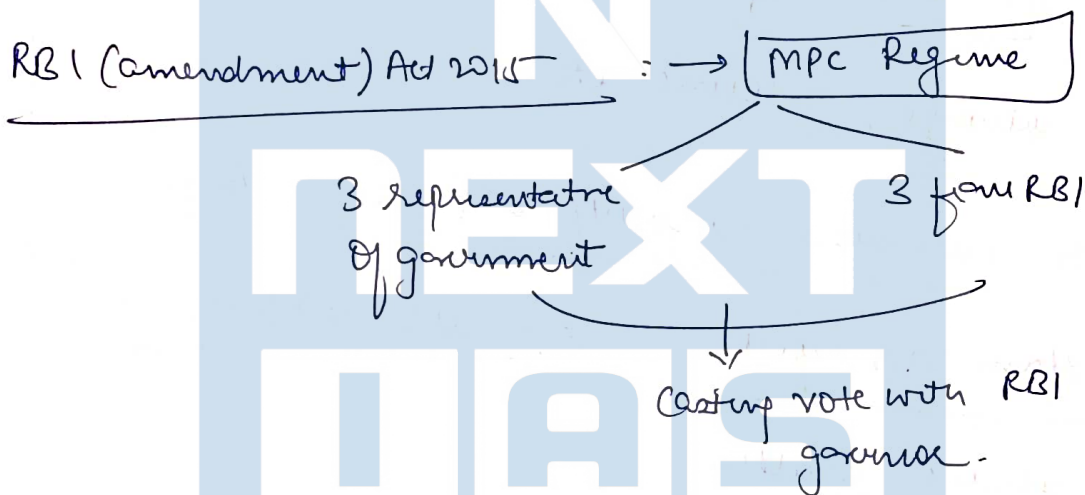
Through active fiscal policy & short term imposition of windfall taxes, government can fund infra projects to realise vision of Aatmanirbhar Bharat.

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

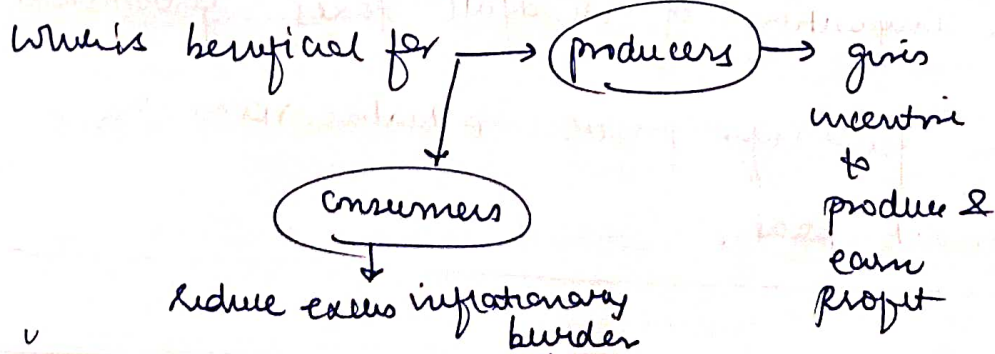
MPC Regime was established in 2016 based on recommendation of Vijay Patel headline Committee to maintain inflation target at 4% with tolerance limit of $\pm 2\%$.



The July 2023, inflation breached threshold of 6% and stood at 7.7%.

Perceived success of MPC regime :

(a) maintain a healthy rate of inflation at 4% $\pm 2\%$



Thus, it balances the interest of consumers & producers.

- (b) Though diverse composition of members, it give enough participation to government to influence policy rates.
- (c) maintains exchange rate stability and excess currency depreciation and appreciation and maintain current account deficit.

Challenges:

- (a) limitations to control & supply side factors
(eg) — oil price rise in west Asia / Russia, monsoon breaks & supply of food grains.

Thus, it can address demand side factors.

- (b) contradictory policy goals of managing growth and inflation through rate hikes.

- (c) challenge of 'Impossible Trinity' $\left\{ \begin{array}{l} \text{inflation} \\ \text{exchange rate} \\ \text{money supply} \end{array} \right.$

Thus, through combination of fiscal & Monetary measures, headline inflation can be maintained at 4% $\pm$ 2% bracket.

- Q.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

UNFAO declared 2023 year as International year of Millets. Thus, millets has become a key food crop to which has united attention of policy makers.

Millets include Jowar, Bajra, Ragi etc and have potential to ensure sustainable agriculture & food security.

Promotion of Sustainable Agriculture

- (a) Can be grown in semi dry and arid regions
Thus, non-irrigated areas have huge potential.

- (b) tolerant to climate change shocks like heat waves etc.

- (c) doesn't require excess water and fertilisers.
Thus can reduce side effects like ground water depletion & eutrophication.

- (d) Can promote "Agro-climatic Regional Planning". In NW part of India

Promote food security

- (a) Can address issue of "hidden Hunger" among children and reduce stunting (35%) and wasting (19%)
- (b) diversify calorie basket from wheat & rice to more sustainable diet.
- (c) can also improve health benefits like:
 - ↳ fight diabetes & non-communicable diseases
 - ↳ fight obesity, gastric issues.
- (d) can improve maternal health issues. Nearly 60% are anemic as per NFHS-5.

Challenges

- (a) limited awareness among consumers
- (b) dominance of wheat & rice in PDS
- (c) less market availability of seeds & tech-know.

Cues can be taken from Odisha which introduced millets in mid day meal. Thus millets has potential to reduce diabetes burden & advance SDG4.

- 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 was introduced in 2019 to ensure availability of functional Household Tap Connection (FHTC) in rural households in rural areas by 2024.

Potential of Jal Jeevan Mission

- Water stressed regions of India
- Per capita availability is less than mandated standard of 55 Lpcd (UN)



Significance of Mission

- Can reduce water related health issues through availability of safe water (e.g. Diarrhoea etc)
- Reduce burden on women to fetch water from far distances.
- essential to maintain dignified life under Article 21 of Constitution

- (d) quality water can aid → educational outcomes among children and advance their cognitive development
- (e) It will reduce out of pocket expenditure to access water (eg) as happening in Vidarbha. Thus can reduce poverty.

Impediments

- (a) as present coverage at 68%. Thus, falling behind target
- (b) supply chain disruption (eg) Ukraine conflict disrupted steel & cement supplies - essential for the mission
- (c) depleted water bodies & ground water (eg) as seen in Maharashtra & Punjab
- (d) political issues and red tapism in bureaucracy

Measures needed include decentralised approach, regeneration of local water bodies and community led mission mode implementation

This will ensure attainment of SDG 4 & ease of living in Rural India

- 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

Battery Energy Storage Systems

(BESS) are technologies that can store excess electrical generation and can help in mitigating variation in demand & supply of energy.

Applications

- (a) store excess energy generation through solar & wind power projects.
- (b) They are essential in e-vehicles to reduce reliance of fossil fuel run vehicles and reduce CO₂ emissions.
- (c) BESS can ensure electrification of rural areas and help reduce imbalances in regional development. (eg) in Tribal and forested pockets.
- (d) essential for defence of India as in border areas — electricity remains constant

in operating systems like BOLD-DIT.

(eg) in Bangladesh Border areas.

Evolution through BEES:

- (a) Can enable access of electricity and bring spin off benefits like
 - digitisation
 - internet connections
 - increase penetration of tele-medicine & tele-education
- (b) reduce reliance on inputs of Battery systems from China & save crucial forex.
- (c) Can advance India's aim to attain net zero by 2070 and 500 GW of energy through renewable sources (India's Panchamrit)

The new found lithium reserves in J&K can help in manufacturing of BEES and thus advance technological developments in battery system.

It will enable India to emerge as a leader in climate justice and attain SDGs (13/14/15).

- 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

The recent success of Reusable
Launch vehicle Autonomous landing (RLV-LEX)
is a significant breakthrough for Gaganyaan
mission

Gaganyaan mission aims to send 3 astronauts
in low earth orbit by 2024. Thus, making
India a key player in space ecosystem.

Recent developments:

- (a) successful demonstration of Reusable launch vehicle.
- (b) training of 3 IAF pilots in Russia to train in outer space environment.
- (c) cross ministerial & cooperation in field of food security in outer space, to encounter health challenges.
- (d) ISRO's attempt to conduct experiments in micro-gravity.

Challenges of Gaganyaan Mission

- (a) Cost heavy mission i.e ₹10,000 crore project
- (b) ethical concerns . like tradeoff b/w sending humans to space or spend the amount in welfare objectives
- (c) the challenges of mission going wrong are high.

Possible benefits for society

- (a) scientific temper development of Indians.
This is also a fundamental duty of all under Article 51(A)
- (b) increased curiosity to understand space and increased interest towards STEM and space study
- (c) can encourage space tourism in India
- (d) possible attraction of private sector including FDI in this sector.

Gaganyaan mission will positively influence Indian society and increase India's stature

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.

(Answer in 150 words) 10 Marks

Green Hydrogen is a form of renewable energy formed by electrolysis of water using renewable sources like solar, wind energy etc.

National Green Hydrogen Mission launched in 2022 has the potential to alter how economy & society functions.

Silver bullet to tackle pollution

- (a) it can de-pollute industries being run on fossil fuels and reduce CO_2 , NO_x , $\text{PM}_{2.5}$, PM_{10} emissions.
- (b) it can de-pollute vehicular sector by using Hydrogen based fuel cells which can drastically reduce pollution & reduce Urban Heat Island Effect.

Candidates must write on this margin

Silver bullet to tackle climate change

- (a) It can replace the conventional sources like gas, coal etc that can aid reduction of CO_2 emission and attain climate goals of 1.5°C by 2030.
- (b) Since it can be produced in decentralised manner, there is no coal and gas based extraction, this also reduces carbon emissions.

Challenges associated:

- (a) to replace conventional sources ~~as~~ the energy sources needs to match the:
- ↳ technological reliability
 - ↳ cost of production
 - ↳ environmental sustainability
- (b) ^{Green} Hydrogen is a costly process, the technology remains tech and cost centric. Thus limiting its uses

- (c) Also, it is less sustainable due to its flammable nature & risk associated with transportation

Through Research & development (increase more than 2% of GDP), the fuel of future can help India attain its "Panchamruta".

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

Land subsidence incident at Joshimath has brought before the implications of dominant economic development in India especially in Himalayas.

Joshimath, a town established on old landslide material was incurring increased land pressure due to increase in population, unsustainable tourism and hydroelectric projects.

Key lessons

for disaster management:

- (a) sustainable agricultural & economic activities must be undertaken in view of sensitive seismic prone region.
- (b) eco-tourism is a necessity to ensure sustainability.
- (c) As highlighted by Chopra committee,

due regard to environment and restriction
of Hydro projects in himalayas must be given
for environment conservation

- (a) reduce deforestation
- (b) reduce overgrazing by pastoralists
- (c) ensure afforestation and undertake
light weight construction
- (d) ensuring population pressure is equitably
distributed in the region
- (e) more sustainable agro-economic practices
like orchards / horticulture etc.

What more needs to be done?

- (a) Bathymetric studies to understand ground
water situation
- (b) formation of Glacial lake formation
- (c) in long run, reduce Carbon emissions to
advance goal of attaining 1.5° ~~as~~ average
global temperature.

Through Gandhian values, sustainable
development can be ensured.

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 arrest of Anurag Singh, leading Wavus Punjab De, a Khalistani separatist organiser shows Khalistan issue is still simmering.

Genesis of Khalistan issue

It has roots in Punjabi Suba movement which advocated separate homeland of Sikhs with increased autonomy. (1960s). Further the movement snowballed into a separatist movement under Bludrauwale which led to operation Blue Star (1985).

Recent developments

- ① 2020 - referendum by Sikhs for Justice for Khalistan.
- ② threat to diplomats in Canadian embassy
- ③ rising radicalism in Australia and UK among some Sikh community people.

Measures needed

Since the movement does not draw much attention among majority of Sikhs in India, who are committed to Indian Ideals & Constitution.

There are some measures needed :

- (a) Reducing discontentment among certain Sikh people regarding : — employment, water sharing issue & agricultural marketing in Punjab.
- (b) diplomacy : through increased collaboration with Canada's, UK's & Australia's authority to suppress anti-India activities.
- (c) propagate ideas of peace, brotherhood and any prevent any attempt to incite hatred through active law enforcement.
- (d) resolve cases of de-sacrileges in Punjab.

Though, legal security measures against miscreants and soft power and effective governance, the issue can be resolved.

- 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

The usage of kamikaze drones born by Russia & Ukraine has highlighted its potential to challenge India's border security. The anonymity & ease of operation makes it more challenging.

India's border situation



Potential impact of drones

- (a) Congfluence of state & non-state actors in usage of drones aids to increasing threat level in Western Borders. (eg) ISI & Let/Tem drones
- (b) Remotely controlled gives anonymity to handlers. Hence, it is difficult to ascertain the handlers

- (c) lone wolf attacks Can also increase due to its remote operations.
- (d) The conventional radars are ineffective in ascertaining low lying threats posed by drones as seen during 1AF Jammu attacks.
- (e) The swarm drones and drone detection system can also be overwhelmed by confusing birds with drones.

Measures needed:

- (a) DRDO developed "Drone Guns" using lasers can be used to destroy in both hard kill & soft kill mechanisms
- (b) Drone nets can be established along borders to disallow unwanted intrusion.
- (c) Regulation of sale & purchase of drones in India
- (d) Implementation of Drone Regulations in "no-fly" zones.

Since it is a "dual use technology", there is a need to amend "Warsenar Arrangement" to account for potential threats caused by drones.

- 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

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

aims to liberalise the electricity generation, transmission & distribution ecosystem in India

Provisions of Amendment:

- (a) It allows non-discriminatory use of discoms networks in cities by interested discoms players. Thus it allows more private & public discoms participation.
- (b) It enhances accountability of load dispatch centres in managing loads & moderate the supply.

More provisions can be understood through its advantages for instance:

Advantage to Consumers:

- (a) more discoms in energy supply segment gives more choices. Thus, charges and

quality of supply will improve.

- (b) the cap price ceiling will also reduce unnecessary burden of price hikes and over charging by discoms.

Advantages to Discoms

- (a) it allows more market participation, thus enhancing competition & thereby enhancing service delivery operations & standards.
- (b) the supply networks can be leased out, thus additional income will come to discom operators.
- (c) possible elimination of cross subsidisation, this will reduce price burdens and help them reduce their liability which is more than ₹1 lakh crore.
- (d) operationalisation through smart meters and advanced transmission ~~ss~~ wires will reduce AT & C losses.

Advantage to environment

- (a) mandatory renewable energy purchase agreements (RPA) will ensure green energy usage.
- (b) it will aid, renewable energy sector like Hydrogen, solar & wind energy.

Shortcomings associated with it:

- (a) electricity being a Concurrent list subject, states complain of high handedness.
- (b) elimination of cross subsidisation goes against consumer & farmer welfare and social justice
- (c) State SERC's are better placed than NERC to allow private discom participation.

Measures needed:

- (a) the bill need to be sent to joint parliamentary committee to discuss all clauses with stakeholders like farmer union, discom operator etc
- (b) thru consensus based approach changes can be made.

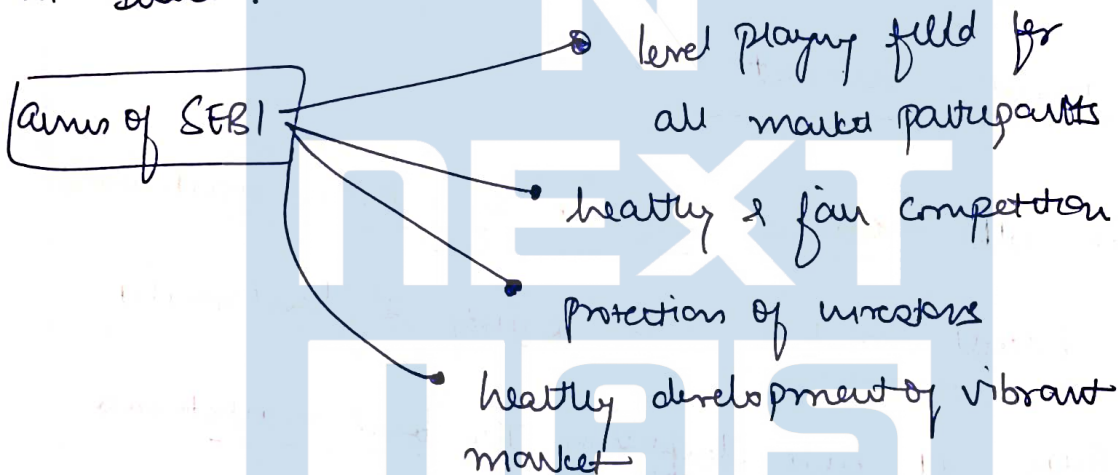
The amendment as a key to reform power sector in India.

Q.12

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

SEBI is a security market regulator established under SEBI Act 1992. It is a watchdog of entire security (primary & secondary) market in India.



Role of SEBI:

- (a) It registers the market participants like depositories, stock brokers, trustees etc and monitor their conduct for common good of all.
- (b) It monitors unfair practices like insider trading, price rigging and disallow under advantage to anyone.

- (c) through light touch regulation it allows just & fair regulation while at the same time allowing innovation through Regulatory Sand box mechanism.
- (d) through Whistleblower Protection Regulations 2015, it disallows wrongdoings and ensure protection of investor interest.
- (e) it also allows diverse investment opportunities for retail investors in equity & bond market.
- Thus, it aids deepening the bond market and aid startup ecosystem in India.

Challenges faced by SEBI:

- (a) the technological developments at evolving pace has made SEBI more reactive than proactive regulator. (eg) Co-location scam in 2022.

- ⑥ allegations of keep lax in regulations of offshore based derivatives (especially P-notes).
- ⑦ laxity in regulations and ensuring formation of price bubble in markets. (eg) as seen during Hunderberg disclosures.
- ⑧ due to technicalities, the market is still out of reach for normal retail investor.

Measures needed:

- ① align with global norms like International Organisation of Securities Market Commission (IOSCO) principles.
- ② avoid duplication of regulations with role
clarity with RBI. (eg) in case of NBFCs & insurance products & IRDAI
- ③ use AI based surveillance mechanism.
- ④ as used by RBI Dablu & IFSCA's Suptech mechanism
- ⑤ capacity building through exchange programs.
Through liquidity regulations & prudential regulations SEBI can aid in creating a healthy market for a developing India.

- 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

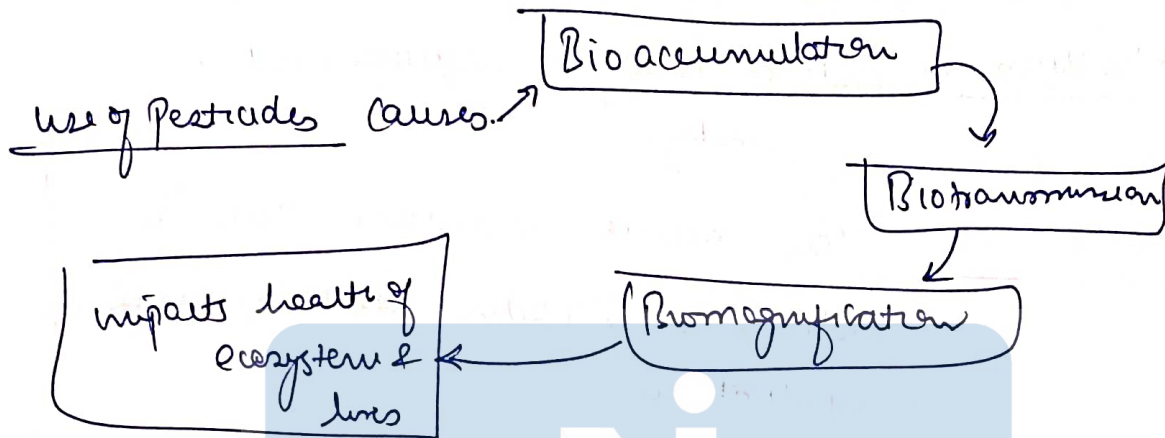
Despite being a major contributor to the Indian economy, the agriculture sector is plagued by several constraints that impede its growth and development. Discuss the role of technology in overcoming these constraints.
(Answer in 250 words) 15 Marks

Agriculture remains the backbone in Survival of Indian economy employing 48% of population and sustaining 69% of India's population in rural India. It contributes 16% to India's GDP.

Constraints faced by agriculture sector:

- (a) Small land holding 86% farmers are small & marginal. Thus, it reduces economies of scale in production.
- (b) over reliance on ground water i.e. around 90% ground water consumed by agriculture. Thus making it environmentally unsustainable.
- (c) China produces 3 times more with the same amount of water & land than India.
- (d) one application of NPK fertiliser makes the

soil degraded. Thus lowering the production & productivity. This also aids eutrophication.



(d) MSP regime has distorted agro-climatic planning. This reliance on monoculture has reduced productivity & development. (e) Pulses has stagnated in production of wheat & rice since last decade.

(e) APMC model also does not realise agricultural outcome. Since MSP advantage is cornered by 6% large farmers (NITI Aayog source). Thus, low price demoralised future productivity.

(f) low storage & also ensures wastage of foodgrains. (g) India can hold only 47% of its food grain production.

How technology can help?

(a) Thrive use of nanotechnology;

Nano Urea - reduces Nitrogen requirements & Wastage

Nano Sensors - can monitor moisture, thus can reduce excess water extraction and application

(b) Thrive biotechnology: GM seeds & crops can reduce pest attacks and increase production

(c) GM cotton, Dhara Mustard, etc

(c) Precision farming using ISRO satellite program mitigate SARAL can ~~aid~~ climate change induced losses.

(d) AI based drones & robots can also help in fertiliser spraying and maintaining N:P:K ratio.

(e) Agri extension services by Krishi Vigyan Kendras can also ensure "do to land" practices.

Technology has the potential to reform agriculture & double farmer incomes as envisaged by Dalwai Committee.

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

Irrigation refers to process of supply of water to crops & fields in agriculture sector.

Common methods include: flood irrigation, micro irrigation (drip irrigation, sprinklers etc)

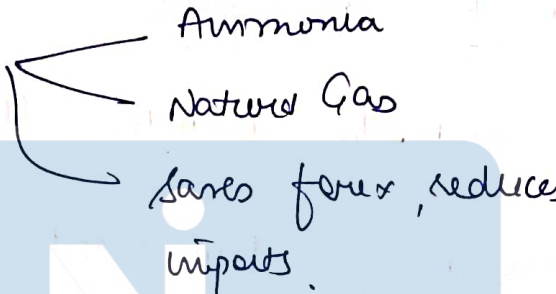
Impact of Irrigation on Environment & Natural Resources

Positive Impacts:

(a) Micro irrigation has reduced occurrence of soil salinity, alkalinisation and ensured sustainable farming.

(b) Micro irrigation ensures sustainable use of water resources & power resources, thus helping environment, reducing costs and improving farm incomes.

(c) fertilization techniques can also reduce excess application of fertilisers (Urea, DAP, etc) through controlled release & absorption. Thus,

it reduces reliance on 

- Ammonia
- Natural Gas
- Saves forest, reduces inputs.

Negative impacts:

(a) sprinklers & drip irrigation are costly. Thus, around 86% of small & marginal farmers whose annual income is less than ₹ 22,000 per month. (approximate)

(b) excess reliance on flood irrigation causes:

- ↳ salinization of soil, alkalinization
- ↳ poor fertilizer absorption
- ↳ excess water usage and wastage
- ↳ enhances methane emission in paddy cultivation.

Thus harming agriculture & environment both.

Measures needed:

- (a) Integrated Watershed Management under PM-KISAN Sankranti Yojana to sustainably use water resources and allow apt application.
- (b) Custom Hiring Centres (CHCs) for lease-based availability of spinklers & drip irrigation facilities.
- (c) Harvesting Traditional knowledge mechanisms
- (e) Baoli, Tubewell systems in drought prone areas.
- (d) Extension agencies & Precision Agriculture through joint operation of ISRO & ICAR: to ensure 'last & land' technology adoption.
- (e) new allocation to "per drop more crop" segment of PM KSY and mentoring farmers.

Through collaboration of farmers, government & environmentalist, the menace of unsustainable agriculture can be corrected to attain SDG & climate justice.

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. H.J. Bhabha and Dr. Vikram A.

Sarabhai as stalwarts of Indian Scientific
and technological domain whose contribution
have revolutionised the scientific domain in
India.

Their contributions can be seen in terms of their
contribution in development of technology, institutions
and bringing science closer to society.

Dr. H.J. Bhabha & Atomic Energy

(a) He was the pioneer of India's 3-stage
nuclear program which harnessed the
minimum available uranium and extensive
availability of Thorium in India.

(b) India is still in 2nd stage of nuclear
cycle of energy production.

- (c) His contributions also guided the aim to develop Nuclear bombs which resulted in "Project Smiling Buddha" and "Project Shakti".
- (d) He headed the Department of Atomic Energy and guided policies of Nuke development in India with emphasis on its peaceful & humane uses.
- (e) the advent of "Nuclear medicine" in present times in treatment of Cancers, tumours have benefited Indian society at present.

Dr. Vikram A. Sarabhai & Space technology

- (a) He was the pioneer and brainchild of space technology in India. He established INCOSPAR in 1962 which later became ISRO.
- (b) He guided the INSAT programme, Arjuna missile launch which increased global stature of India.
- (c) He envisioned the utilisation of space technology

in socially accepted solving social problems

(c) the Disaster Management in India,
communication & navigation using NAVIC etc

are largely due to his futuristic vision.

(d) He mentioned Dr. Satish Dhawan and Dr. A.P.J.

Abdul Kalam who went on to develop advanced
satellite & missile systems in the country

which has created new defence related deterrence
in present times.

The present peaceful "Nuclear Doctrine
of India" (2003) and future goals of ISRO

like Gaganyaan & space tourism and global

standing of India has largely been due to
contribution of Dr. Bhabha & Dr. Vikram Sarabhai

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। (250 शब्दों में उत्तर दीजिए) 15 अंक

(Generative 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)

Artificial Intelligence refers to intelligence possessed by computers that mimic the potential and abilities of humans.

Generative AI related to potential of AI to develop and create new products, texts, Genes through collation and collaboration of existing data. It largely relies on large language models (LLMs) like ChatGPT, Bard etc.

Potential to push boundaries of Innovation

Generative AI can help in sectors like:

(a) Agriculture: creating and developing new GM based seeds, fertilisers to aid agricultural growth.

(b) Education: through customised curriculum based on student's cognitive development, education & skilling can be made student friendly.

and can be democratised.

(c) Health : through development of vaccines by identifying the genome of new viruses, bacteria through super computer aligned with AI, it can generate new medicines.

(d) Judiciary : through translation of judgements, digitisation of pending cases, predicting their outcomes, it can reduce delays in justice delivery. (eg) Supreme court uses AI based tools like SOPACE & SUVAS.

(e) Transportation : through AI based self driven cars, signal and traffic management and smart navigation, AI can decongest the vehicular movement especially in cities.

(f) Law enforcement : Generative AI aligned with Automated facial recognition Technology (AFRT) can generate pictures & analyse behaviour of past offenders.

Concerns associated with Generative AI

Challenges to society:

- (a) AI based algorithms can capture human biases - (eg) against gender, people of colour

Can perpetuate discrimination & equality.

As seen in California where blacks were targeted by Automated facial recognition systems.

- (b) data leakage and analysing behaviour of

individuals can be misused. As Open AI CEO, Sam Altman said, democracy remains at risk through use of AI.

- (c) ethics that remain core to a society's culture cannot be imbibed by computer systems.

Thus their impact may be counterproductive.

Measures needed : light touch regulations as seen in EU & China can be adopted to regulate its unfair use. . Also, licensing of AI tools based on societal impact of tools can also be a way forward.

The double edged sword like AI needs better regulation

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 महत्व 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

India joined Mangrove Alliance for Climate (MAC) at COP 27 of UNFCCC at Egypt.

It is a collaborative initiative of India, Indonesia, Spain, UAE etc.

Purpose of MAC

- (a) ensure education and awareness on importance of mangroves in coastal ecology
- (b) enable multidisciplinary collaboration on mangrove research among activists, governments, CSO & private sector.
- (c) protect & conserve mangroves and spread awareness about its utility in fight against climate change.
- (d) propagate idea of planting & protecting more mangroves around the world and their role in protecting flora & fauna.

Importance of Mangroves in mangrove coastal ecology:

- (a) they act as buffer against storm surges, cyclones and even tsunamis. Thus protecting coastal habitations & livelihoods.
- (b) habitat for flora & fauna and their development. (eg) Bengal Tiger in Sundarbans, Sea otters, fishing cats.
- (c) provide livelihood opportunities to fish farmers along coasts. though a fishing & aquaculture. (eg) in Andhra Pradesh & Tamil Nadu.
- (d) Carbon sequestration: they sequester 4 times more carbon than any other source. Thus, it aids climate action.
- (e) protects coastal groundwater aquifers, though creating barrier for saltwater intrusion.

① They act as guard against coastal
land & soil erosion. Their long roots act
as barrier for survive water and aids
soil deposition

However there are certain challenges:

- ① deforestation of mangroves for aquaculture
industrial production.
- ② increase in diseases
- ③ Severity of cyclones & tsunami can disturb
the mangrove ecosystem.
- ④ encroachment by humans for agriculture &
settlement.

India has its own MISHTI programme to
conserve nearly 5000 km of mangrove in
India. India needs to align MISHTI with
MAE so that it aids in sustainable development
targets (SDG) & goal of net zero by 2070.

- 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

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

Coalition for Disaster Resilient Infrastructure

(CDRI) is an initiative by India which brings together governments, think tanks, private sector in making disasters resilient infrastructure throughout the world.

It brings robustness to disaster management approach in India.

- (a) it allows sharing of best practices and knowledge among stakeholders to develop new knowledge systems for strengthened disaster management.
- (b) it allows for data & information sharing among nations for apt response to disaster and subsequent recovery.

(c) It provides a platform for multidisciplinary research including on modern and traditional knowledge. This aids improving the strategies.

India being a disaster prone country can harness the gains through CDRI.

(d) through fund raising, CDRI can ensure better financial preparedness of states.

(e) through joint training of NDRF/SDRF with other countries can impart sharing of best practices among nations.

Thus, CDRI reforms the Disaster Management approach in India and improves its global profile in tackling climate change.

Need for a new Strategy

(a) Since disasters in climate change scenarios will be more region based and transnational

It requires formation of National, Regional & Global Strategy and maintaining their coherence and interlinkages.

(b) The Arctic amplification, collapse of Gulf stream and weakening of AMOC can impact climatic situation in India. Thus, thorough knowledge sharing & research needs to be integrated in Disaster management practices.

(c) The threat of Nuclear arms race and threat of chemical & Bio warfare also needs preparation and capacity building of NDRF/SDRF personnel.

(d) South Asia as a whole is prone to natural disasters. Thus, "Whole of - the - region" approach is needed in preparation of Disaster Management plans.

Through renewed strategy interlinked with regional concerns & climate change phenomenon India can enhance its role of "Net Security provider" in region.

- 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

The attack by ransomware on AIIMS selling server and usage of Wanna Cry, Petya etc in past has highlighted urgency in tackling cyber threats in India.

Key factors — contributing to this trend:

- (a) Rise of digital ecosystem around the world and interconnectedness has opened up new avenues of threat.
(eg) Cloud based computing, Blockchain, AI etc.
- (b) Anonymous provided by Darknet and usage of Cryptocurrency in demanding ransom gives a 'regulatory bypass'. Thus increasing threat potential.
(eg) France attack in 2015 were aided by crypto financing.

(c) Lightning speed technological evolution has reduced effectiveness of agencies like CERT-IN, Cyber Swachhata Kendras. Thus, rising the threat potential.

(d) Work from Home has enabled use of Personal desktops for official work. Thus, personal laptops may not be resilient to cyber threat as office desktops. This hampers the operations of Private Companies.

(e) Reliance on imported technological equipments also makes system vulnerable. (eg) Mumbai electricity grid attack by China, Colonial pipeline Hack in USA.

Impact of these attacks:

(a) data leakage and privacy intrusion can allow mapping of individual characteristics and subsequent behaviour modification.
(eg) Cambridge Analytica case.

- (b) disruption of essential services eg) Healthcare
Communication can impede economic growth.
- (c) disruption of cyber architecture and
possible misuse of nuclear weapons & technology
- (eg) Strike attack on Kudankulam nuclear
plant, stunnet in gear.
- (d) it can lead to increase in mistrust of
digital technology among citizens.

Measures needed:

- (a) indigenisation of technology and softwares
- (eg) National Security Directive of for Telecom
operators.
- (b) AI based surveillance by CERS- IN, NCIC
agencies
- (c) data sharing among agencies & corporates.
- (d) digital sensitisation of users.

Though enhanced digital security,
India can reap real potential of digitalisation
and attain developed country status in 2047.

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?

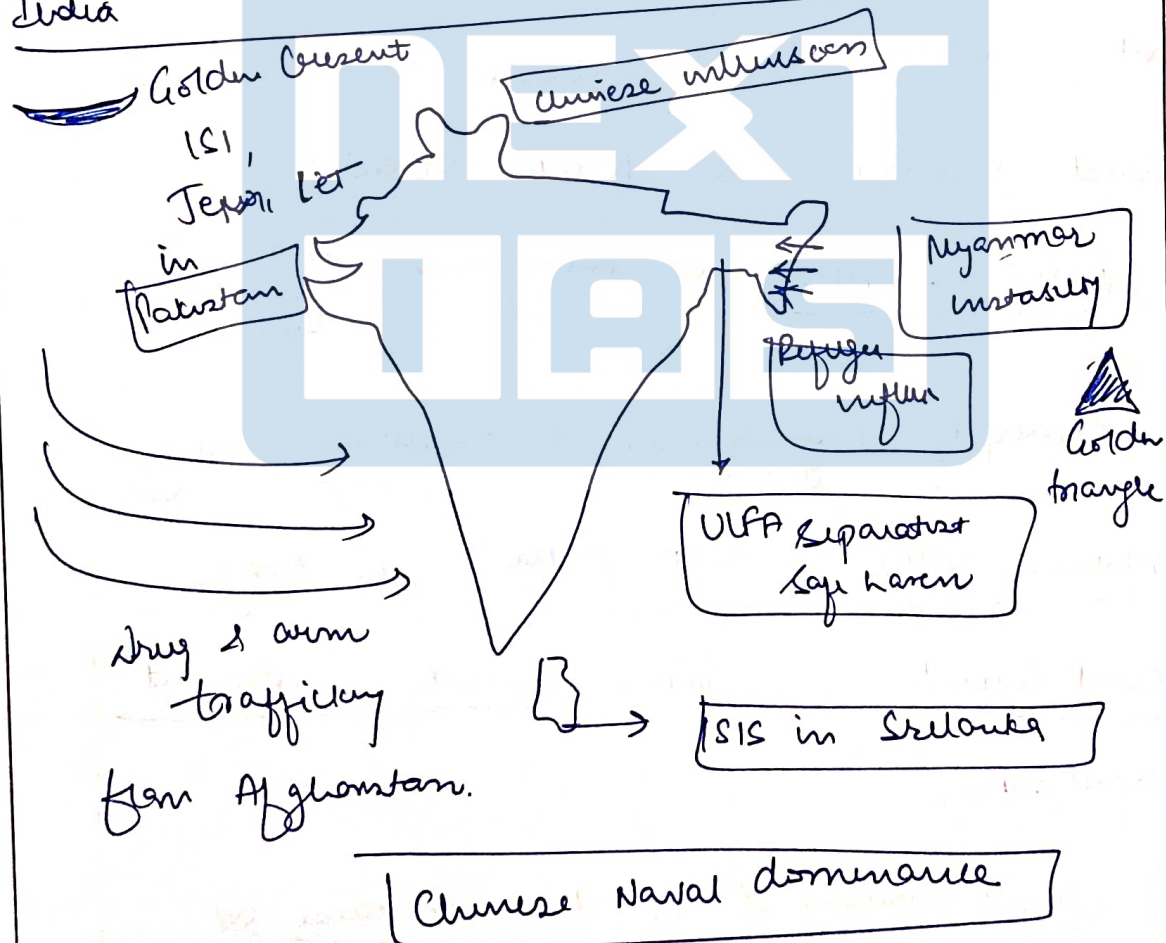
(250 शब्दों में उत्तर दीजिए) 15 अंक

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

The vast land boundary and maritime boundary of 7516 kms with 20 lakh sq km of EEZ with hostile & unstable neighbourhood pose considerable border threat to

India



It shows considerable border threat of India.

What is needed? — Cooperation & Coordination among different agencies.

- (a) Joint training exercise among paramilitary and army can improve role sharing
- (eg) in Indo-Myanmar Border (Assam Rifles & Army)
- (b) Intelligence sharing among defence establishment, RAW, IB can ensure coordination to avert infiltration & terror attacks.
- (eg) Pulwama attack was one of failed intelligence system
- (c) Sharing of infrastructure & resources among maritime police & state police with Navy, Coast Guard can ensure seamless movement and action
- (d) Joint training & operation exercise at regular basis with neighbouring countries and among defence agencies (eg) TROPEx

(e) joint coordination missions along borders.

(e) operation Sunrise at Indo-Myanmar border, anti piracy operation in Horn of Africa.

(f) effective data sharing by systems like

CIRMS, BOLD OIT, Perimeter Intrusion

detection system can aid swift action

(g) India can leverage forums like ISRA, IFC at regional level.

(h) through digital platforms like NATGRID.

Challenges:

(a) low technological reliance and lack of trained manpower

(b) trust issues among security agencies.

Through, synchronised collaboration

and proactive operation, India can mitigate

threat to its borders and become a "net security border" in Indian Ocean Region.

Space for Rough Work

