

TEST CODE : 5 1 3 2 4

FIAS - MGP 2022 (C-9 Alt) - Sectional Test #6

Forum IAS

GENERAL STUDIES

Name Of Candidate

ARJUN GUPTA

Roll No.

1910099366

Date:

26/08/2022

Maximum Marks: 250

Time Allowed: Three Hours

INDEX TABLE

| Q. No. | Max. Marks | Marks Obtained |
|---------------|------------|----------------|
| 1 | | |
| 2 | | |
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| 4 | | |
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| 17 | | |
| 18 | | |
| 19 | | |
| 20 | | |
| Total: | 250 | |

INSTRUCTION

- Please do furnish Name, Email, Roll No and Mobile in the answer sheet.
- There are TWENTY questions printed in ENGLISH & HINDI, all questions are compulsory.
- The number of marks carried by a question/part is indicated against it.
- Answers must be written in the medium authorized in the admission Certificate, which must be stated clearly on the cover of this Question-Cum-Answer (QCA) Booklet in the space provided.
- Word limit in questions, if specified, should be adhered to. Any page or portion of the page left blank in the Question-Cum Answer Booklet must be clearly Struck off.

Any specific messages for ForumIAS Mentors/Evaluators with respect to your copy? Write it here.

• Let me know, areas where I can reduce content to save on time.

Evaluator's Discretion:

For Student Only

Start Time |

5-00 pm

End Time |

8.05 pm.

Total Marks:

Mode Of Examination:

Online Offline

Evaluator's Discretion: This is the marks awarded at the discretion of the evaluator based on your overall impression, on the basis of (but not limited to) your handwriting, presentation, use of diagrams, flowcharts, facts and figures or absolutely anything that he/she liked in your copy.

For Office Use Only

ECN CODE:

EG:

Evaluation Date:

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

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

Genetically Modified organisms are the organisms which have been altered through biotechniques through gene manipulation resulting in properties favorable for human use. Some prominent examples — Bt Cotton, Transgenic cows, etc.

Advantages of GM Organisms

- ① Higher productivity: GM crops like IR8, Bt-Cotton yield high productivity ⇒ boosting income of farmers.
- ② Control against pests and diseases — for eg) Bt-Cotton immune to Pink Bollworm, transgenic cows resistant to FMD diseases.

- ③ Climate resilience through water hardy and temperature resistant species. \rightarrow Bt-Rubber recently introduced
- ④ New Geographies to plant crops which will boost food security

* Risks of GM Crops

- ① Carcinogenic impacts leading to cancer & other diseases
- ② Invasive species by building anti-microbial resistance among existing pesticides
- ③ Proliferation of ~~pest~~ fertilisers \Rightarrow leading to eutrophication

Thus, the GM crops offer a solution to food security issues but a robust mechanism through GEAC approval should continue to operate

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

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

Fuel cell electric vehicles are those driven by the chemical reaction taking place in the cells with input of oxygen. Eg Hydrogen powered FCEV

Battery vehicles on the other hand, have fixed storage with internal reaction without need for external supply of oxygen. Eg Electric vehicles.

Fuel Cell EV

Battery Electric Vehicle

- | | |
|---|--|
| <ul style="list-style-type: none"> ① Require input of oxygen and other elements ② Convert chemical energy to electric energy ③ Only cathode/anode need | <ul style="list-style-type: none"> ① Convert the internal energy through electronic movement to run vehicles ② Convert stored electrostatic energy into electric ③ Whole of the battery |
|---|--|

to be changed on discharge

need to be change ones discharged

④ low infrastructure requirement as input does not specialized requirement

④ Robust charging requirement to reduce range anxiety

⑤ low Refuelling time (5-10 min.)

⑤ High recharging time (12-13 hrs)

* Advantages of Electric Vehicles

- No GHG emissions
- Better air quality leading to better health outcomes
- Economic multiplier in Industry
- Reduce fuel imports

* Measures

- ① Charging infrastructure
eg Battery Swapping policy
- ② Securing supply chain of key EV components
- ③ Policy certainty to attract PLI and FDI in EV sector

The EV hold the potential to help India achieve Net zero by 2070 while maintaining growth

| Feedback (For OFFICE use only) | |
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| Structure/Presentation | |
| Question Interpretation | |
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Q.3) Space based technologies are helpful in not only monitoring development, but also enhancing it. Discuss. (10 marks, 150 words)

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

Space economy in India accounts for 5% of total globe economy. The recent liberalization of geospatial data, formation of NSIL, InSpace is expected to give further boost to economic growth.

* Space Technologies : To monitor development.

① Cadastral Mapping : preparing efficient land use and land records ⇒ better property taxation
 & titles leading to credit access

② Geotagging of Assets eg ISRO's Bhuvan Portal
 to tag MGNREGA assets ⇒ reduce leakages

③ Agriculture Management through weather forecasting advisory services eg MKisan app.

* Space Technology : To boost development :

- ① Commercialization of R&D : Recent NSIL formation will enable private firms to use ISRO research to boost economic growth.
- ② Satellites and Telecom : 5G is driven by the constellation of satellites providing low latency & high speed \Rightarrow boosting growth
- ③ Localized Performance Vehicle recently launched allowed GPS-based landing of flights ~~so~~ leading to boost airports in far flung areas
- ④ Agriculture surveillance & optimum growth strategy
 - detection of disease
 - time of harvest

Thus, Space sector is expected to be a sunrise sector in Indian economy as we enter Industrial Revolution 4.0.

Feedback

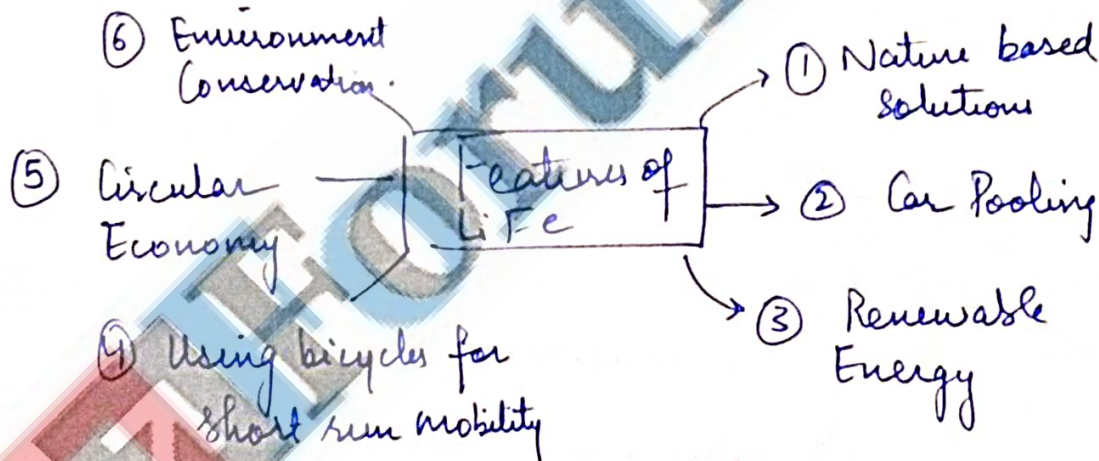
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Q.4) Ensuring sustainable consumption and production patterns for an environmentally conscious world is not possible without fundamental changes in lifestyle. Discuss this statement in light of Lifestyle for the Environment (LiFE) Movement. (10 marks,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

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

Lifestyle for the Environment (LiFE) movement was launched by PM Modi on the sidelines of COP26 in Glasgow by emphasising on environment friendly day to day life style in line with SDG-12 of sustainable production & consumption.



* Current lifestyle threatening Environment

① Consumerism based on "wants" and not "needs"

(Don't Write anything in this)

- ② Inequality in accessibility, affordability and quality of basic utilities like fuel, health care.
- ③ Individualistic lifestyle + tragedy of commons.

* LiFe for Sustainable Development

- ① Pro-Planet People : by inducing behavioral change at micro level. eg switching off lights not in use
- ② Household level intervention
 - segregation of waste
 - not dumping in drains
 - discarding single use plastics
- ③ Community level
 - car pooling
 - usage of public transport
 - Nature based solutions like Miyawaki Technique, roof gardens.

The road to environment protection requires action at lowest levels, thus, need for localization of SDGs.

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

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

(10 अंक, 150 शब्द)

Disaster management is defined as effective planning, organization & coordination of activities to reduce the impact of disaster. The ~~past~~ Senda framework focus on 3Ps — Prevention, Preparedness & Proofing to manage risks.

* Flood Risk Profile of India

- around 16% of country's total area is prone to risks.
- Erratic monsoon due to climate change and melting of glaciers pose higher risk to floods in plain areas

Flood Prone Areas



- Brahmaputra, Ganga flood plains + Western Ghats are most affected.

* Flood Preparedness :

NDMA guidelines provided for. -

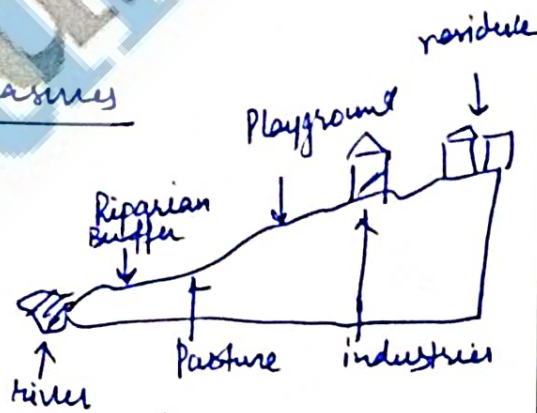
① Structural Measures

- 1) Levee construction & strengthening of embankments
- 2) desilting of rivers & proper drain management
- 3) Rain gardens, Bioswales to allow seepage to excess water.
- 4) Dams & reservoirs to act as vent for excess supply.

② Non-Structural measures

① Flood Zone Mapping

② Flood proofing through double storey buildings



③ Early Warning System + River Basin Organization

The proactive approach to flood tolerance & resilience can help reduce economic & human loss

Feedback

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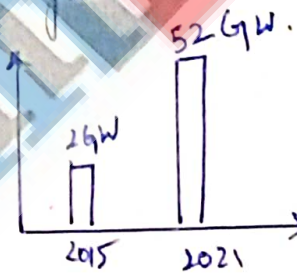
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2.6) Solar power sector is not only leading the mitigation efforts against climate change, but the innovations in solar power can also accelerate adaptation of agriculture to a new reality of changed climate. Discuss. (10 marks, 150 words)

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

(10 अंक, 150 शब्द)

The solar energy in India has gained a great leap forward with more than 50 GW of energy being produced through it. It forms 13% of total energy capacity & rise more than 25x in last 6 years.



* Solar Power & Climate Change:

- ① Reduce GHG emission by providing alternative to fossil fuels. → reduce \$ 42B in imports per year
- ② Renewable source that is forever available & thus, no issue of supply.
- ③ Help in moderation of climate by reducing the evaporation — floating solar plants.
- ④ Boost economic growth through employment

Solar Power & Adaptation of Agriculture

- ① Solar powered pumps in agriculture feeds—
thus, reducing need for feeder separation
eg PM KUSUM scheme.
- ② Check on Energy - Food - Nexus by rationalization
of subsidies & incentive to save power \Rightarrow reduce
alkalinization & groundwater depletion.
- ③ Diversification of Agriculture by efficient use of
water \Rightarrow causing climate resilient species
like millets.
- ④ Boost farmer income \Rightarrow help adopt modern
technology \Rightarrow horticulture + commercialization

Thus, the solar power has potential to
transform wide range of sectors to
establish India on sustainable growth path

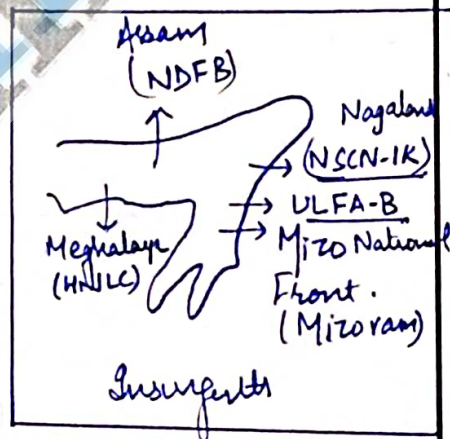
Q.7) Necessitated by contingent law & order situation in the North-Eastern states in 1958, Armed Forces (Special Powers) Act (AFSPA) continues to be applicable even after six decades of its enactment despite widespread criticism. Critically evaluate the utility of AFSPA in light of prevailing security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

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

Recently, killings of 14 civilians in Mon has reignited the debate of utility of AFSPA in North East. Further, Centre withdrew AFSPA from 23 districts of Assam & 7 districts of Nagaland in aftermath of incident.

* Utility of AFSPA

- ① Hotbed of insurgents
↳ requires special powers to Armed force to contain their spread.



- ② Local support further makes it difficult to conduct COIN operations
- ③ Free Movement require help provide easy escape & AFSPA thus allows faster response to cross border mobility

- ④ Drug trafficking, human trafficking & gunrunning are rampant.

Negative Impacts

- ① Public distrust due to killing of civilians has proved to be counter productive.
- ② Human Rights violation are further leading to fueling of separatist tendencies.
- ③ AFSPA → leading poor investments → unemployment among youth
↓
easy to radicalize

Way Forward — development based approach
through → Parvat mala project
 → Strengthening local bodies
 → Sports as bonding unit.

The need is to keep a blend of law & order & development led approach with inclination towards latter.

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

(10 marks, 150 words)

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

Fake news is defined as the unverified, self constructed story aimed at creating disinformation or misinformation with aim to fuel discontent & social disharmony.

* Fake News as Internal Security Challenge

- ① Disinformation leading orchestrated protest
eg farmer toolkit issue, London rights.
- ② Radicalization of youth by instigating them on false narratives - eg recent killing in Udaipur
- ③ Communal riots by promoting false pictures of destruction of religious shrines.
- ④ Criminalization of society like Jamara nexus of criminals using profile of users

to create fake deeps & extorting money.

- Checking fake news
- ① Employing fact checkers on social media
 - ② Pro-active govt media cell to disable any such posts
 - ③ confirming the authenticity of source

Institutional arrangements

- ① IT Rule 2021 - provide for 3-tier structure to check spread & appointment of nodal officer by social media companies.
- ② Information Technology Act provides for penalty & punishment to create & propagate fake news.
- ③ Cybersecurity cells in police stations
- ④ NCIIPC, Cert-In, provide support check cyber threats & hate messages.

The space of tech is a double edged sword & needs to be managed effectively with robust measures.

Feedback
(For OFFICE use)

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Presentation

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Value
Addition

Total

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

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

Recently, the govt launched Agnipath scheme which replaces the old colorful scheme for recruitment of soldiers to the three branches of army. It is also called as the Tour of Duty scheme.

* Salient Features:

- ① Four year recruitment service period instead of 17 year in earlier scheme
- ② Age eligibility: 17.5 to 21 yrs (until 23 for 2023).
- ③ 25% of the disbanded soldiers would be re-recruited back into service.
- ④ Sum of Rs 11.5 lakh at end of 4 yrs as part of Seva Nidhi Package

(Don't Write anything in this)

Benefits

- ① leaner army by reducing average age to 27 years
- ② All India All Services - remove North India bias in recruitment
- ③ Preparation for hybrid warfare by releasing capital for technology advancement
- ④ Reduce pension burden of govt.
- ⑤ Better civil - military fusion

Issues

- ① Kindergarten army with short training period
- ② Social security issues as no pensions
- ③ Unemployment after disbandment
- ④ Parlous security situation on both borders need more troops on ground

Ways to overcome

- ① Creating a pilot to see how it performs
- ② Assuring jobs and integration into society through entrepreneurship

The scheme has potential to call for long held reforms - it must be balanced with youth's aspiration

Feedback (For OFFICE use only)

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

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

Organized crime syndicates are the group of criminals that pursue criminal activity as business enterprise.
Some prominent examples - D-Company, etc.

Technology to Expand Activities

- ① Transboundary shipments of contrabands, drugs, arms that has helped by the communication technology like Dark Web.
- ② Managing logistics through apps like Telegram which have "burn off" message feature that are difficult to track

Diversification of activities

- ① Avenues of Money laundering through

NFTs, cryptocurrency ⇒ reduced the risk of being caught due to anonymity features.

② Hedge funds & pensions have allowed the organized crimes to hide their actual earnings.

③ New form of business like pornographic rings, commodification of women, ransomware to blackmail such business.

* Dealing with Menace

① KYC norms to secure the details and ensure authentication of users

② Strengthening laws like MCOCA, KCOCA and bringing national level laws

③ Investing digital security infra to track, detect & deter technology use by criminals

The technological use cannot be held hostage to such crimes, it need to be dealt strictly.

Feedback
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Q.11) Nanotechnology is an inter-disciplinary and inter-connected science that has revolutionary applications across sectors. In this perspective, discuss the relevance of nanotechnology for socio-economic development in the country. (15 marks, 250 words)

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

(15 अंक, 250 शब्द)

Nanotechnology is defined as the understanding control of matter in the nano dimension i.e. size of approx 1-100 nanometers where unique features generate novel applications.

* Nanotechnology as Revolutionary

- ① Spread across sectors like medical, industries like automotive.
- ② Impetus to the security domain and playing important role in combating climate change.
- ③ Overall boost growth through novel innovations.

* Relevance of Nanotechnology

① Health Applications:

- 1.1 Targeted drug delivery leading to better efficiency & stronger immune response eg Chasotin, liposomes.
- 1.2 Diagnostic Treatment
eg Gold nanorods used to detect kidney stones.
2. Food Industry - use of nanocemulsifiers to increase digestability of food and flavor release
3. Bioindicators like mosses and nanoparticles like oxybenzone are key to environmental change and detection of pollution respectively.
4. Agriculture
 - Bio fertilizers are delivered through nanotubes at the roots of plants
 - Nano Urea liquid recently developed aims to reduce usage of fertilisers by 50%.

5. Nano Carbon tubes are revolutionizing energy sector through high thermal conductivity & low transmission loss.

6. Waste Treatment Plants rely on nanomaterials like nanogels and nanosilver tubes

However, the challenges remains -

- ① Poor R&D in Nanotechnology
 - Expenditure remain <1% of GDP.
- ② Skilled workforce act as roadblock.
- ③ Manufacturing capacity is abysmal

Thus, the need of hour -

- ① PLI scheme to boost nanotechnology linkages
- ② Industry-academia linkage to boost production

Thus, the nanotechnology needs to be fully exploited to increase economic multiplier while ensuring environment stability

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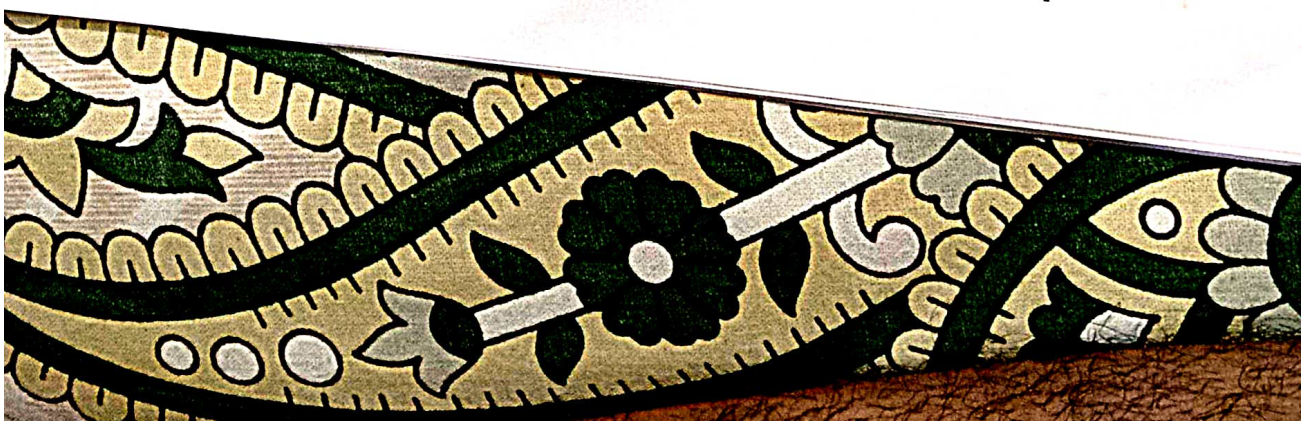
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| Structure/ Presentation |
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Q.12) The increasing demand for stronger Intellectual Property Rights (IPR) protections is motivated by a desire to invigorate a groundswell of innovation, but it is more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

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

(15 अंक, 250 शब्द)

Intellectual Property Rights (IPR) are referred to as rights over creation of minds. It gives the person who innovates to ensure propriety rights over innovation in form of trade secrets, patents, copyrights.

IPR as Motivation

① Promote innovation

- IPR gives the incentive to earn profit which enables the innovator to undertake innovation.

eg Covid Vaccines

② Prevent market failure as without IPR, innovator may not be yield full marginal benefits of innovation due to lower selling costs and imitation by others

- ③ Boost economic growth - as innovation directly leads to efficiency increase & new export & domestic demand.
- ④ Prevent piracy - this ensures the culture of innovation remains intact. eg Biopiracy of Indian Basmati rice by US firm.
- ⑤ Preserves traditional knowledge - as done through Geographical Indicators - boosting rural economy.

IPR leading to Monopolies

- ① Against Free Market : by providing innovator easy leverage to cost as much higher without competition.
- ② create inequality with respect to ~~income~~ accessibility eg Covid Vaccines invisible in African regions

(Don't Write anything in this)

- ③ Against interests of developing countries as they lack the infrastructure to create innovations.
- ④ Form of neo-colonialism by developed to create market for their industries.
- ⑤ Patent laws like evergreening and denying compulsory licensing goes against human rights especially in healthcare innovations.

Thus, there is need to find balance between ensuring innovation and human needs -

- ① Allowing compulsory licensing in emergency or crisis esp. health (eg WTO COVID waiver)
 - ② Sharing of technology esp. in underdeveloped countries
 - ③ Exempting key sectors like food security
- Thus, the fine balance of two would ensure innovative growth (SDG 9) along with inclusiveness

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

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

(15 अंक, 250 शब्द)

The digital revolution fostered by Industrial Revolution 4.0 through Artificial Intelligence, Machine Learning Robotics is changing the 21st century with both positive and negative impacts on our lives.

Digital Technology & Opportunities

① Democratization of Health facilities

↳ through telemedicine - leading to lower costs and accessibility to all. e-Sanjeevani

② E-Governance - helping to reduce leakages & better beneficiary targeting.

eG Comin App.

③ Financial Inclusion leading to poverty alleviation e-Rupi, Digital Rupee.

④ Education accessibility in Covid 19 through
NISHTHA, DIKSHA portals.

⑤ Inclusive infrastructure

→ Barkhaa: digital
NCERTs for books
for visually impaired

→ New wheelchair
devices with automated
features.

⑥ Trade & Commerce

↳ proprietary rights like NFTs, Blockchain

↳ cryptocurrency for trading.

Digital Technology as Threat

① Privacy Issues

- data theft in form credit card
- revenge porns and crimes (eg) Recent
Bulla Bai & Sulli Deals case.

② Regulation of data

- use of consumer data without consent
- commercial exploitation resulting in
manipulation (eg) Cambridge Analytica

③ Biasedness in AI systems

- ↳ exclusionary data leading to racism
- ↳ opaque system leading to addiction on social media website.

④ Internal Sovereignty

- ↳ data flows across-border
- ↳ role of anti-state actors
- ↳ radicalisation, money laundering.

Way Forward

① Primacy to privacy.

- ↳ Data Protection Bill
- ↳ Data Protection Authority

② Robust data and cybersecurity tools and institutions eg NCIPC, CERT-In

③ Use of blockchain with security features to exploit growth potential eg Estonia Model

The technology cannot be silenced due to fear of threats, it needs to be exploited for greater social benefits by creating deterrence to new threats

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

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

Single Use Plastic ^(SUP) is defined as the plastic which consumer intend to use only once before disposal or discard. like disposable glasses, ice cream sticks.

India produced 4 kg of SUP per person per year.

* SUP and Impact

① Health Impact

- Single use plastic enters the food chain leading to bioaccumulation in food chain
- Cancer related problems in humans
- Contamination of water leading to breeding of mosquitoes - dengue, cholera.

② Economic Impact

- result in coagulation of drains and rivers - frequent floods → loss to infrastructure.
- impact the quality of resources like minerals, minerals leading to poor quality products
- products and market of textiles which have high labor force potential impacted by plastics (eg. Jute).

③ Environmental Impact

- Non-biodegradable → remain in environment forever.
- soil degradation due to block of soil aeration killing microbes.
- Marine pollution - 9.MT of plastic released every year causing hypoxic zones leading to death of marine animals.
(eg. Pacific Garbage).

However, recent Plastic Management Rules 2021 -

- ① Prohibit manufacture, use & sale of SUP in India.
- ② Increase thickness of plastic to 75µm.

However, there is need to take steps —

- ① Technology upgradation of recycling units to improve collection and reusability.
- ② Data on compositable plastics to ensure rules are not violated.
- ③ Waste to Energy through new innovations.
- ④ Monetization of waste eg Indonesia model of free bus rides in return for plastic.
- ⑤ Private sector → Unplastic Collective
→ India Plastic Pact

Thus, the plastic management must be based on collaboration of 4P — People, Private sector, Public Funding & Producers.

Feedback

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

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

Green Hydrogen refers to the hydrogen produced using renewable technology to electrolyse water.

Currently, only 0.18% of H_2 produced is green. Recently, India launched its Green Hydrogen policy.

* Reasons for interest in Green Hydrogen:

① Cheap and clean

- Hydrogen is omnipotent and easily available as H_2O .
- Green hydrogen ~~is~~ almost zero GHG emissions compared to Brown, Blue hydrogen.

② Energy dense: almost 2-3x energy dense than petrol \Rightarrow hence, can be used to decarbonise hard to abate sectors like

Shipping, airlines

- ③ superior to Battery Vehicles
 - low refuelling time - 5 minutes vs 12-13 hours in Electric Vehicles
 - high distance coverage.
- ④ Reduce import dependency as oil forms 88% of imports leading to reducing current account deficit.
- ⑤ Boost storage capacity and achieve Net Zero aim by 2070.

Challenges of Green Hydrogen

- ① Highly inflammable and difficult to detect leading to health hazard.
- ② Transportation issue as need to be stored at -273K to ensure low leakage

- ③ High infrastructure cost makes it unviable for private sector.
- ④ Nascent technology and low storage capacity.
- ⑤ Policy Deficiencies
 - multiple ministries involved MNRE, MoRTH, Power Ministry
 - inter-state coordinate lacking to ensure full potential

Way Forward

- ① Additive Manufacturing to boost production of electrolyser for H₂ generation.
- ② Financial incentives in form PSL, loans
- ③ Policy certainty to incentivise investments

Green hydrogen holds the potential to address security needs & ensure clean, affordable energy (SDG7)

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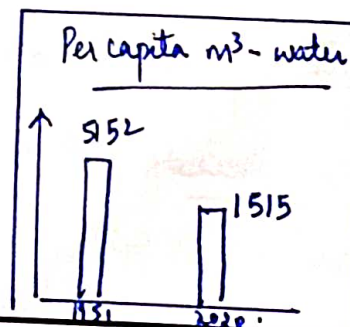
Q.16) Making the invisible groundwater visible is critical for building climate resilience and achieving sustainable development goals. Examine. (15 marks, 250 words)

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

According to 5th Irrigation Census, the level of groundwater has declined by 67% between 2005-15 showing the lack of responsible usage in groundwater resources.

* Need for Ground water Conservation:

- ① 92% of agriculture usage.
- ② Country has 17% of total world's population but only 4% of water resources
- ③ Demand - supply mismatch is expected to become 2X by 2030
- ④ Declining per capita water availability lead to water stress situation



Issues in Groundwater use

- ① Water intensive agriculture: Economic Survey 2020 commented that India's agri skewed towards water intensive crops like rice (3000 ^{litre/kg}), ^{sesame} (1500 ~~kg~~ litre/kg).
- ② Virtual water exports amounted to \$50B ^{m³} through exports of agriculture commodities.
- ③ Around 33% of country's groundwater resources face critical stress (CGWA Report).
- ④ Contamination of groundwater due to decomposition of waste by industries in open fields.
- ⑤ Overuse of fertilisers leading to percolation of toxic metals like Arsenic into groundwater.
- ⑥ Lack of regulation as groundwater belongs to owner of land.

To check overexploitation, need of the hour is -

- ① Promoting water-efficient crop species like millet, lentils => shift away from cereals.
- ② Strict laws on groundwater extraction
- ③ Rationalizing electricity subsidies to break the nexus of food, energy & water
- ④ Promote microirrigation and drip irrigation to reduce water usage.
- ⑤ Traditional conservation methods — phads, suangams, baolis.

Thus, the sustainable use of groundwater will ensure food security (SDG2) as well promote hydrological balance.

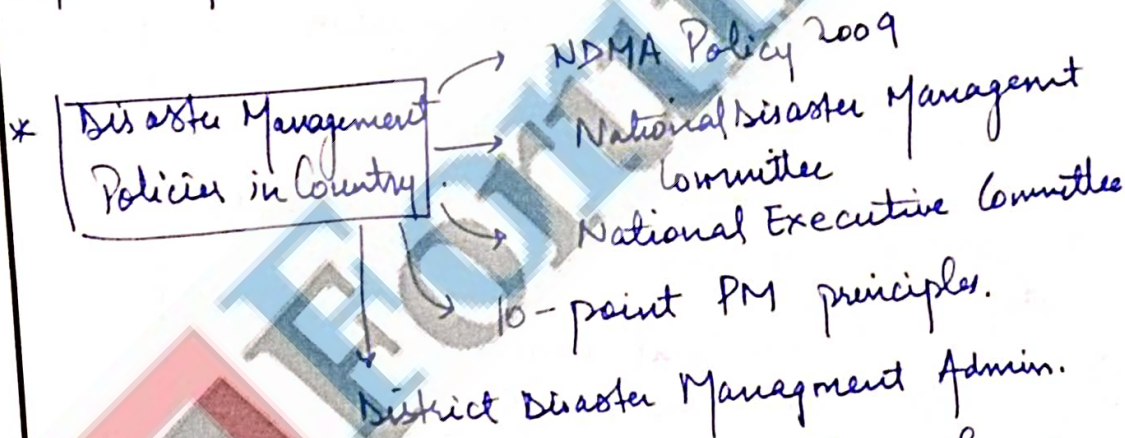
Feedback
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Q.17) Despite the presence of a strong institutional framework and clearly stated policy, huge losses in terms of human, financial, environmental and livelihood show that India still struggles in effective management of disasters. Discuss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

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

According to Disaster Management Act 2009, Disaster Management is continuous and integrated process of formulating, organizing, coordinating and implementing measures to reduce effect of disasters.



However, despite this India faces huge loss on the account of physical proximity to disasters as well as policy gaps that remain.

* Reasons for Policy Gaps

① Top Down Planning

- primary responders like panchayat, urban bodies remain out of policy consultation.
- one size fits all approach for different regions

② Legislative framework

- Model Town Planning Bye laws almost absent \Rightarrow haphazard urbanization.
- lack of climate risk management.

③ Manpower

- \rightarrow limited battalions of NDRF
- \rightarrow SDRF almost absent
- \rightarrow structural engineers vacancy at more than 8000 (NITI Aayog)

- ### ④ Funding
- non formulation National Disaster Mitigation Fund (15th Finance Commission)
 - poor financial devolution to states.

- ### ⑤ Capacity building + awareness remain at low levels.

Addressing the gaps

- ① Adoption of Byelaws in Planning and review of National Building Codes.
- ② Creation of list of disasters at national, state & district levels [2nd ARC].
- ③ Making DDMA & SDMA as primary responders to disasters [2nd ARC]
- ④ Decentralization of Disaster Management to local levels.
- ⑤ Integration of disaster manuals into school curriculum.

The prevention of disaster risk and vulnerability needs to be undertaken at the level of schools while maintaining structural measures.

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

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

India's geography warrants different specialization & skills in different regions due to differential nature from deserts in west to coastal waters in peninsula. This has resulted in different forces guarding borders.



Security Forces Deployed

- ① In Western North India
 - Along with Pak border along LOC - Indian Army
- ② Along International Border with Pakistan from Gujarat to J&K - Border Security Force

- ③ Coastal security is ensured by three layers service - Indian Navy + Indian Coast Guard &

State Marine Police Force

- ④ Along line of Actual Control with China: ITBP
- ⑤ Nepal & Bhutan Borders - Seema Suraksha Pad
- ⑥ Myanmar Borders - Assam Rifles
- ⑦ Bangladesh border - BSF

Challenges at Borders

- ① Geographical barriers
 - Passes, snow capped mountains in J&K
 - deep river valleys & dense forests in North East
 - open borders & shifting river courses in Nepal, Bangladesh.
- ② Multiplicity of forces of accountability leading to confusion & lack
- ③ lack of state of the art infrastructure to ensure quick mobility in hilly terrains.
- ④ Environmental clearances and delays in building roads & tunnels. → Char dharm project.
- ⑤ Drug trafficking and open borders ~~are~~ along

With free movement regime (Myanmar) lead to difficulty in catching insurgents

* Ways to address

- ① One Border One force to ensure coordination and synergy.
- ② State of the art defence technology like CCTV, Thermal cameras
- ③ Outsourcing of infrastructure like roads, tunnels [Shetkatar Committee]
- ④ Border fencing CIBMS and BOLD-SIT in all borders [Madhwal Committee]
- ⑤ Village development programs like BADP

Thus, the border security requires intervention in both infrastructure accessibility as well as local intelligence

Feedback

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Q.19) In what ways management of maritime borders differ from that of territorial borders? Also, analyze various vulnerabilities that arise from a large maritime boundary of the country.

(15 marks, 250 words)

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

(15 अंक, 250 शब्द)

India has 7500km long coastline which offers high economic potential but also presents key maritime security challenge against piracy, terrorists and state actors like China.

* Difference between Maritime & Territorial Borders.

Maritime

① Open seas with Freedom of Navigation

② High collateral damage risk due to fishermen and other trade activities

③ Cannot be guarded by fenced wires

Terrestrial




① Territorial borders mostly defined ⇒ ensuring certainty

② Easy to identify targets given the direction & position of civials

③ Guarded through LIBM, BOLD-QIT.

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* Vulnerabilities from Maritime Boundary :-

- ① Terrorist Infiltration - easy to infiltrate as difficult to distinguish  Mumbai 26/11
- ② Piracy and Hijacking of large shipping vessels causing threat to sea lines of communication and trade activities.
- ③ Political disputes with countries like Sri Lanka leading to killing of fisher men.  Kachchatthuru
- ④ Militarization of coastal waters due to rising interest in Indo-Pacific  Recent Chinese spy ship at Hambantota port.
- ⑤ Lacking infrastructure capabilities with Navy with low warship capacity & indigenous submarines lacking.
- ⑥ Overlapping jurisdictions & clear policy on roles.



is Area)

* Addressing the issue:

- ① Strengthening indigenous capacity of submarines
eg P-75I Scorpens.
- ② National Coastal Security Policy to ensure coordination between different agencies
- ③ International cooperation through groupings like Indian Ocean Rim Association
- ④ Adherence to global order like UNCLOS and forcing other parties to ensure the same.
- ⑤ Three tier structure to be strengthened with human resource.
 - Navy
 - ICG : Coast Guard needs
 - Marine Police Force

The safe lines of communication along sea and robust coastal security infrastructure is key to India's dream of net security provider



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

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

Cyberthreats are defined as the actions in the cyberspace that are aimed at threatening the sovereignty and security of nation through targeted attacks on critical infrastructure. These include cyberattack (Red Echo), Cyber warfare (Huxnet) or cyberterrorism.

Cyberthreats & Citizens

① Impact on privacy

↳ access to personal information and data theft leading to financial risk loss.

② Commodification of women as seen in recent incidences of Pulli Bai & Sulli Deals case.

③ Aversion to technology due to these threats

leads to overall economic loss and growth.

Cyberthreats + State

① Social Stability

↳ radicalization by terrorist groups resulting in communal riots eg) ISIS recruiting from Kerala

↳ false propaganda to boost communal flare

eg) Zakir Naik foundation.

② National Security

↳ Managing cyberattacks on military infrastructure to ~~data~~ exploit military secrets.

↳ Disrupt the critical infrastructure like telecom, power leading to loss of sovereignty

eg) Red Echo, Stuxnet (Israel on Iran)

↳ Using confidential info as a tool to demand release of criminal/terrorists

③ On Individual Sovereignty

↳ Objectification & commodification of



women. ¹⁰⁹ Bulli Bai app, such deals

- ↳ Compromising identity and important financial information leading to economic loss
- ↳ Art 21 - right to privacy violated.
- ↳ Overall, people move away from tech leading to impact on economic growth ⇒ impacting social stability

Feedback

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| Structure/ Presentation |
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