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GENERAL STUDIES (TEST CODE : 1840)

Name of Candidate	POURUSH SOOD		
Medium Eng./Hindi	ENGLISH	Registration Number	1175138
Center	ONLINE	Date	02.09.2022

INDEX TABLE

Q. No.	Maximum Marks	Marks Obtained
1	10	
2	10	
3	10	
4	10	
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6	10	
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9	10	
10	10	
11	15	
12	15	
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16	15	
17	15	
18	15	
19	15	
20	15	

Total Marks Obtained:

Remarks:

INSTRUCTIONS

- Do furnish the appropriate details in the answer sheet (viz. Name, Registration Number and Test Code).
उत्तर पुस्तिका में सूचनाएं भरना आवश्यक है (नाम, प्रश्न-पत्र कोड, विद्यार्थी क्रमांक आदि)।
- There are **TWENTY** questions printed in **ENGLISH & HINDI**
इसमें बीस प्रश्न हैं अंग्रेजी और हिन्दी में छपे हैं।
- All questions are compulsory.**
सभी प्रश्न अनिवार्य हैं।
- The number of marks carried by a question/part is indicated against it.
प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।
- 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. No marks will be given for answers written in medium other than the authorized one.
प्रश्नों के उत्तर उसी माध्यम में लिखे जाने चाहिए जिसका उल्लेख आपके प्रवेश पत्र में किया गया है और उस माध्यम का स्पष्ट उल्लेख प्रश्न-सह-उत्तर (क्यूसीए) पुस्तिका के मुख्य पृष्ठ पर अंकित निर्दिष्ट स्थान पर किया जाना चाहिए। उल्लिखित माध्यम के अतिरिक्त अन्य किसी माध्यम में लिए गए उत्तर पर कोई अंक नहीं मिलेंगे।
- Word limit in questions, if specified, should be adhered to.
प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।
- Any page or portion of the page left blank in the Question-Cum-Answer Booklet must be clearly struck off.
उत्तर पुस्तिका में खाली छोड़ा हुआ पृष्ठ या उसके अंश को स्पष्ट रूप से काटा जाना चाहिए।

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Delhi- 110009

EVALUATION INDICATORS

1. Contextual Competence
2. Content Competence
3. Language Competence
4. Introduction Competence
5. Structure - Presentation Competence
6. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

4.

5.

6.

All the Best

1. While fixed-term employment offers an ingenious way to address specific issues faced by both employers and employees, there are also some concerns associated with it. Discuss in the context of India.

(150 words) 10

हालांकि, नियत अवधि का रोजगार (फिक्स्ड टर्म एम्प्लॉयमेंट) नियोक्ताओं और कर्मचारियों दोनों के द्वारा सामना किए जाने वाले विशिष्ट मुद्दों को हल करने का एक सरल तरीका प्रदान करता है, लेकिन इसके साथ कुछ चिंताएं भी जुड़ी हुई हैं। भारत के संदर्भ में चर्चा कीजिए।

Fixed term or contractual employment
refers to the type of employment where a position and its benefits are offered only for a fixed period, at the end of which the employer is automatically laid off.

How fixed-term employment addresses specific Issues

→ Reduces Employer expenditure

↳ NO long term social security payments needed
↳ Eg. in Indian Government's contractual jobs, pensions, etc. are not included → fiscal prudence.

→ Encourages dynamic job market

↳ linked to demand: more contractual

workers are hired during peak demand phases.

→ Encourages gig economy: like cab drivers, food delivery, etc.

Concerns with Fixed Term Employment

- ① Reduced job security: Dilutes labour rights, encourages 'hire and fire' culture, especially in India, which has a large youth pool.
- ② Sidelines social security: Pensions, life insurance, etc. are usually not included. Worrisome for India which already has a low social security penetration.
- ③ Non-inclusion: Once contract ends, women and vulnerable find it more difficult to reenter the job market.

Strict regulations and social security are a must to ensure employer as well as employee are benefitted from contractual jobs.

2. An efficient logistics sector with a focus on warehousing is pivotal to the success of the Bharatmala Pariyojana. Discuss. (150 words) 10
- वेयरहाउसिंग पर केंद्रित एक कुशल लॉजिस्टिक्स क्षेत्रक भारतमाला परियोजना की सफलता के लिए महत्वपूर्ण है। विवेचना कीजिए।

The Bharatmala Pariyojana aims to strengthen the transportation network of the country through greenfield highways and expressways.

Factors determining Bharatmala Pariyojana's success

① Efficient logistics sector

→ Port infrastructure: where we lack

→ Customs delays (72 days) compared to <1 day in the USA

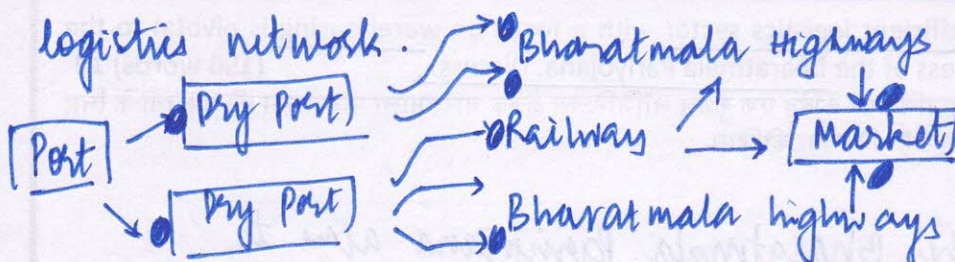
→ Inadequate development of dry ports

→ Railways: can help decongest road sector

→ Reducing cross subsidization

→ Dedicated freight corridors.

How it helps: ① Creation of Multi modal



② Focus on Warehousing

●: warehousing points

- can help in export-import of perishable goods
- makes multimodal transportation more effective → hence improving Bharatmala adoption

Recent Steps

Diamond Quadrilateral

Logistics

→ Bharatmala

Negotiable Warehousing Receipts

Warehousing

National Infrastructure Pipeline

Agricultural Infra. Fund

A cooperative, multi sectoral approach between the infrastructure and logistics sector can ensure the success of Bharatmala Pariyojana.

3. What do you understand by the term 'irrigation scheduling'? Bringing out the advantages provided by it, discuss the difficulties faced in applying it on a farm level. (150 words) 10

'सिंचाई निर्धारण (इरिगेशन शेड्यूलिंग)' पद से आप क्या समझते हैं? इसके द्वारा उपलब्ध कराये गए लाभों का वर्णन करते हुए, इसे खेत स्तर पर लागू करने के समक्ष आने वाली कठिनाइयों की विवेचना कीजिए।

Irrigation scheduling, as proposed by Punjab Govt. recently, refers to a temporal distribution of irrigation plan, region wise, to impose less stress on groundwater resources.

groundwater not used all at once, replenished by rains

Irrigation Scheduling

Staggered use of irrigation facility

Affects crop yield and harvest in different areas.

Advantages

- ① Reduces stress on groundwater resources (50% districts of India are stressed)

- ② Reduce fiscal stress on states : Since staggered irrigation means that not all resources are used at the same time.
- ③ Improve market price : Since it brings slight delay in different regional harvests.

Difficulties

- ① Diversified cropping pattern : Multiple crops grown hence different irrigation requirements for each crop.
- ② Low farmer awareness : leading to anger against policy.
- ③ Implementation difficulty : needs reworking in water distribution system.
- If implemented with due planning, irrigation scheduling helps preserve ground water resources.

4. While the Pradhan Mantri Fasal Bima Yojana was touted as the largest crop insurance scheme globally in terms of farmer participation, various concerns have arisen since its implementation. Discuss. (150 words) 10

यद्यपि, प्रधान मंत्री फसल बीमा योजना को किसानों की भागीदारी के संदर्भ में वैश्विक स्तर पर सबसे बड़ी फसल बीमा योजना बताया गया था, तथापि इसके कार्यान्वयन के बाद कई चिंताएं उत्पन्न हुई हैं। चर्चा कीजिए।

The PM-Fasal Bima Yojana is a crop-insurance scheme that aims to hedge farmers against risks of inclement weather, diseases, etc responsible for crop failure.

Early launch of PMFBY

- ① Wide coverage: All-India

↳ Prerequisite for farmer loans (now discontinued)

- ② Scientific approach: Different premiums for kharif / rabi crops and irrigated / non irrigated crops.

- ③ Wide risk-mitigation: covering various weather related, and disease related causes for crop failure.

Concerns in implementation

① Cooperative Federalism missing

- centrally sponsored scheme, hence state contribution needed
- Recently, centre drastically cut its contribution : affecting state finances

② Malpractices by insurance companies

- Rejecting insurance claims
- Inordinate delays

③ Delays in paying premium component by centre and states

④ Lack of awareness : Especially after it has been made optional : many farmers have dropped out of the scheme.

While the centre has taken many steps like disaster-specific plans (to reduce premium) in PMFBY, streamlining and enhancing the claim disbursement process is the need of the hour.

5. The Stockholm Conference commenced the contemporary "environmental era", which brought a paradigm shift in the environmental governance and set a tone for multi-lateral environmental regime. Discuss. (150 words) 10
- स्टॉकहोम कॉन्फ्रेंस ने समकालीन "पर्यावरण युग" की शुरुआत की, जो पर्यावरणीय गवर्नेंस में एक आदर्श बदलाव लाया और उसने बहु-आयामी पर्यावरणीय व्यवस्था के लिए एक दिशा प्रदान की। विवेचना कीजिए।

The Stockholm Conference, i.e., the UN Conference on Human Environment, 1972,

paved the way to an 'environmental era' and sowed the seeds of the UN Environment Programme (UNEP).

Stockholm Conference - A disruptive event

① Accountability introduced

→ countries for the first time acknowledged their role in environmental pollution

→ the role of developed countries in pollution was highlighted: first step towards "Common but Differentiated Responsibilities"

② Discussed links of development with pollution

↳ It was in this conference that PM Indira Gandhi asserted that "Poverty is the biggest polluter"

↳ Hence the role of the 'First world' in environmental finance and technology transfer was highlighted.

③ UNEP: The conference laid the foundation of UNEP and UN Environment Assembly.

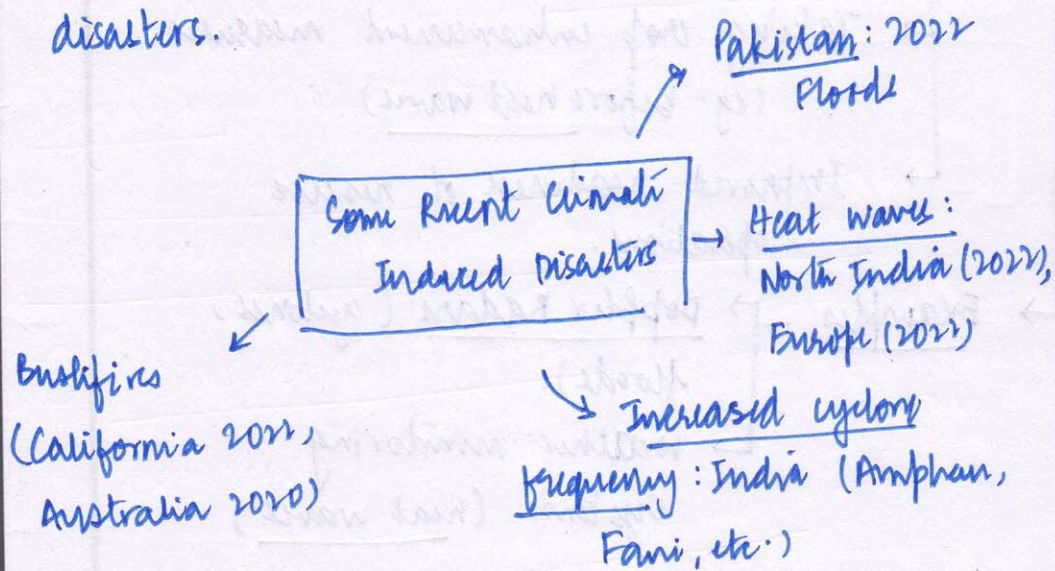
Our then Prime Minister smt. Indira Gandhi, one of the few keynote speakers of the conference, stressed the need for a global fight against pollution and uphold the Indian ethos of sustainable development.

6. The world has witnessed a huge surge in climate-induced disasters, which are largely driven by anthropogenic factors. In this context, analyse the role of early warning systems in mitigating the impact of the disasters.

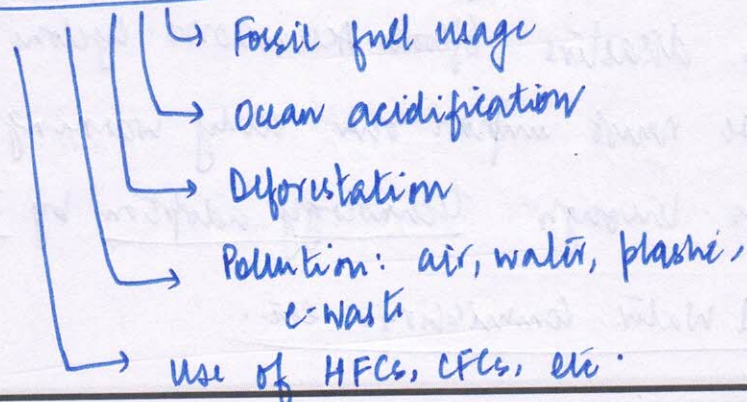
(150 words) 10

विश्व में जलवायु-प्रेरित आपदाओं में अत्यधिक वृद्धि हुई है, जो बड़े पैमाने पर मानवजनित कारकों से प्रेरित हैं। इस संदर्भ में, आपदाओं के प्रभाव के शमन में पूर्व चेतावनी प्रणालियों की भूमिका का विश्लेषण कीजिए।

Climate change, which is projected to increase average temperature by over 2°C by 2100, has caused a surge in climate-induced disasters.



Anthropogenic Factors



Importance of Early Warning Systems

- Quicker Evacuation : Floods, Forest Fires, etc.
 - Reduces damage to life
 - Makes rescue operations easier since there will be less people needing help
- Increased Preparedness
 - stocking up on essential supplies
 - Taking crop enhancement measures (eg. before heat waves)
 - Improved readiness of rescue operations.
- Examples
 - Doppler Radars (cyclones, floods)
 - weather monitoring systems (heat waves)

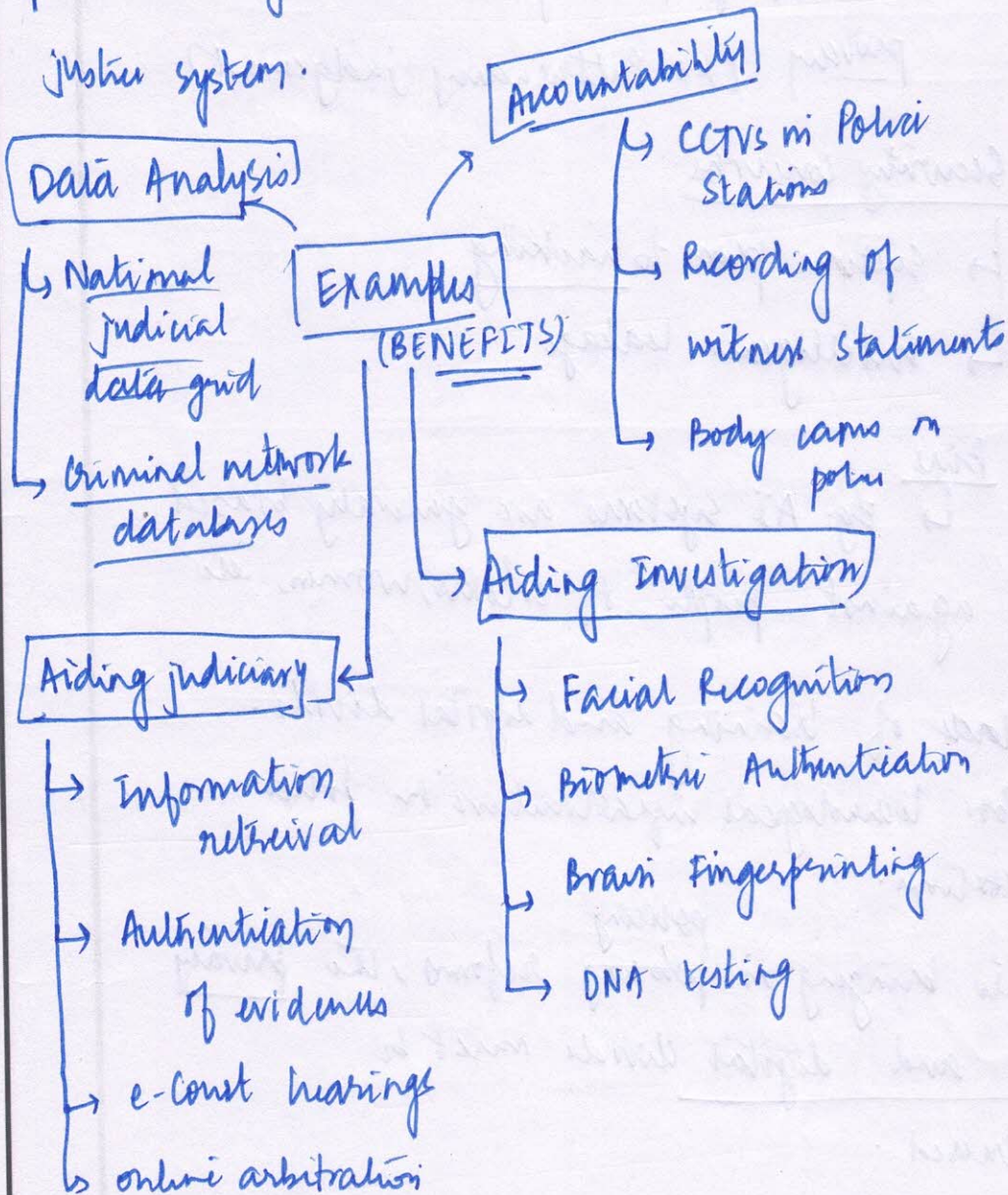
India is facing the brunt of climate induced disasters (floods, Assam 2019, cyclone Amphan) etc. We must improve our early warning systems through technology adoption by IMD, Central Water Commission, etc.

7. Critically examine the implications of leveraging technology in policing.

(150 words) 10

पुलिस व्यवस्था (पुलिसिंग) में प्रौद्योगिकी का लाभ उठाने के निहितार्थों का समालोचनात्मक परीक्षण कीजिए।

Modernising of policing system through technological reforms has been one of the prioritized agendas of the Indian criminal justice system.



Challenges① Absence of data protection law

- ↳ Facial recognition can be used as state surveillance tool
- ↳ Brain fingerprinting, etc: violation of privacy (Ks Puttaswamy judgement)

② Security concerns

- ↳ systems prone to hacking
- ↳ intelligence leakage

③ Bias

- ↳ Eg. AI systems are generally biased against people of colour, women, etc.

④ Lack of training and digital divide.⑤ Poor technological infrastructure in police stations.

While bringing in ^{policing} reforms, the privacy issues and digital divide must be addressed.

8. How far do you agree with the view that climate change poses a threat to international peace and security? (150 words) 10

आप इस विचार से कहाँ तक सहमत हैं कि जलवायु परिवर्तन अंतर्राष्ट्रीय शांति और सुरक्षा के लिए खतरा है?

Climate change has the potential of causing catastrophic disasters, and displacing a huge number of people, threatening international peace and security.

Climate Impact and Threats to peace and security

Impact	Threat
① Rising sea levels: <u>inundation of coastal areas</u> , submergence of islands	• Increased migration. • Threat to sovereignty of <u>small-island developing states</u> • Refugee crisis from low lying countries like <u>Bangladesh</u>

② Increased disaster
severity and
frequency

large scale displacements
disproportionately
affecting developing
countries → migrant
crisis

③ Economic security
threatened

→ unilateral carbon
Tax threatening
rule based world order
→ Increased expenditure
by countries for climate
rehabilitation

④ Threat to water and
food security

→ It is believed that
the world may soon
face 'water wars'

The UNSC recently debated on the
inclusion of climate change on its agenda,
given its threat to international peace
and security.

9. What do you understand by a virtual private network (VPN)? Highlight its advantages and discuss the concerns posed by it. (150 words) 10

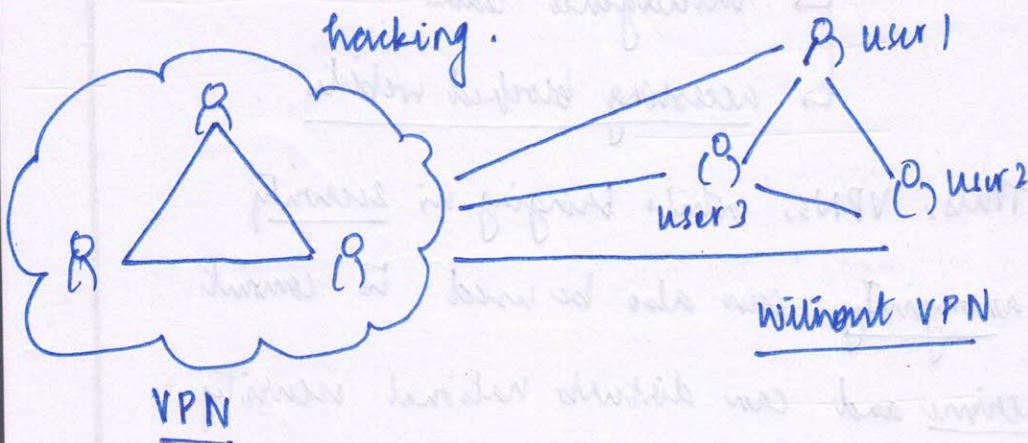
वर्चुअल प्राइवेट नेटवर्क (VPN) से आप क्या समझते हैं? इसके लाभों पर प्रकाश डालिए और इससे उत्पन्न चिंताओं पर चर्चा कीजिए।

A Virtual Private Network is a system of internet networking wherein the IP address of a user is masked and virtually diverted through another location.

Advantages of VPN

① Increased cyber security

→ IP address cannot be intercepted
→ used by companies and groups to protect data and prevent hacking.



② Anonymity: Difficult to track credentials

and location. Used in countries like China that have huge state surveillance systems.

Concerns with VPN

- ① Dark web Accessibility: Usually done through use of VPN
 - drug trade
 - child abuse
 - information leaks
- ② Cybercrime: Difficult to identify hackers, penetration, abusers, etc.
- ③ Threat to national security:
 - undetectable cyber espionage
 - ransomware
 - intelligence leaks
 - accessing blocked websites

Thus, VPNs, while bringing in security and anonymity can also be used to commit cybercrime and can disturb national security.

10. The discovery of the Higgs Boson at the Large Hadron Collider in CERN completed 10 years recently. In this context, discuss the role played by CERN in overall scientific development. (150 words) 10

सर्न (CERN) स्थित लार्ज हैड्रॉन कोलाइडर में हिग्स बोसोन की खोज को हाल ही में 10 वर्ष पूरे हो गए हैं। इस संदर्भ में, समग्र वैज्ञानिक विकास में सर्न द्वारा निभाई गई भूमिका पर चर्चा कीजिए।

The Higgs Boson, or the 'God Particle' that created the universe, was discovered in CERN, a European organisation encompassing Particle Physics and Astronomy.

The Role of CERN

↳ Large Hadron Collider

↳ largest Particle Accelerator in the world.

↳ Multi-state participation in research experiments

↳ Greatly advances our study of the Standard Model of Physics

and beyond: study of neutrinos,

bosons, quarks, etc.

↳ Energy Sources: Studies related to Nuclear Fusion for cleaner energy resources.

India and CERN

↳ Participation in Particle Accelerator Projects: upcoming research facility in Maharashtra.

↳ Collaborative research with premier institutions like IISc Bangalore, IIT Bombay.

↳ Research exchange through CERN-India internship programme.

CERN is arguably the most important research lab in the field of particle physics.

11. Highlighting the factors that affect the cropping pattern in India, discuss the need for modifying it in the context of the emerging agro-ecological concerns. (250 words) 15

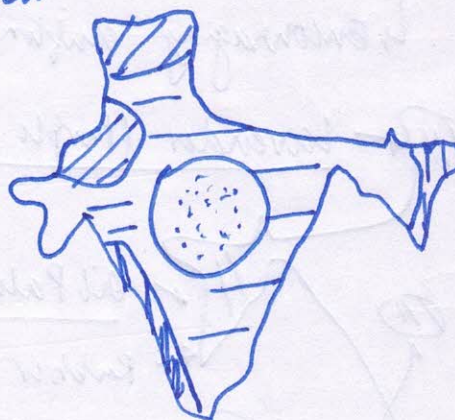
भारत में फसल पद्धति को प्रभावित करने वाले कारकों पर प्रकाश डालते हुए, उभरती कृषि-पारिस्थितिकी चिंताओं के संदर्भ में इसे संशोधित करने की आवश्यकता पर चर्चा कीजिए।

India, that has historically been an agro-based economy, and still constitutes the largest sector by employment.

Factors affecting cropping patterns

① Rainfall: Over 1/3rd of Indian agriculture is irrigated; rest is rainfed

↳ Hence monsoonal rainfall greatly impacts the cropping pattern



baria

← (//) : <50cm

millet like
ragi, jowar,
pulses

← (••) : <100cm

rubber,
coffee, tea

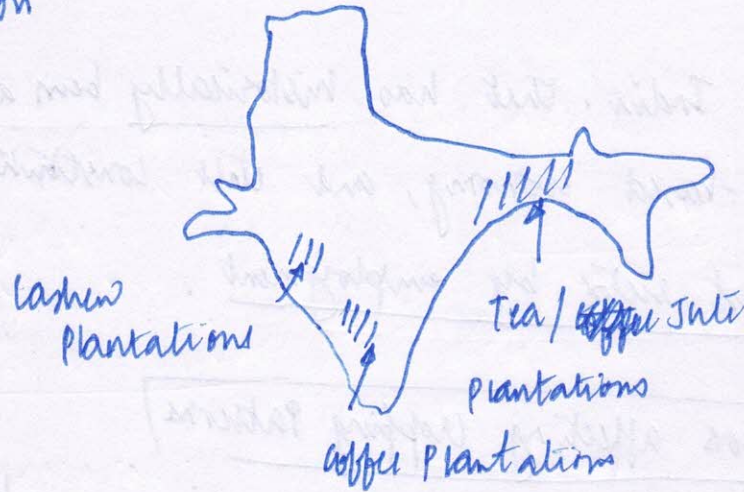
← (—) : >250cm

rice, wheat,
sugarcane

← (—) : 100-200cm

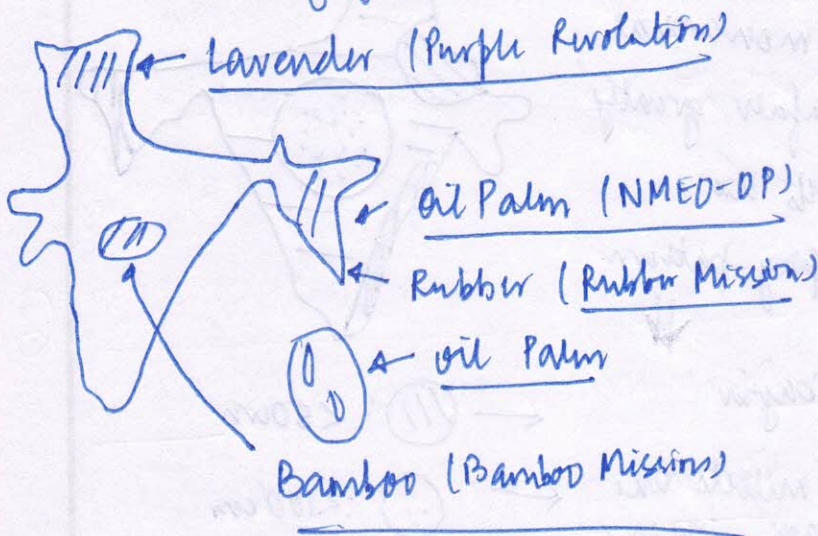
② Historical Factors

↳ Plantations introduced by British: dual region



③ Government Policy

↳ Encouraging shifting cropping patterns:



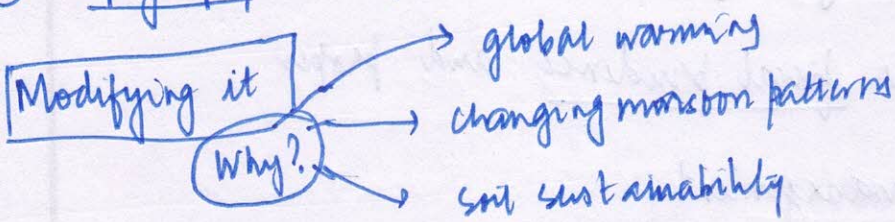
④ Irrigation: Eg. certain areas of West Rajasthan have been brought under cultivation

due to Indira Gandhi Canal.

⑤ Soil type: cotton (Black soil), Sugarcane (Alluvial soil), etc.

⑥ Green Revolution: wheat (Rice in Punjab/Haryana/Western UP).

⑦ Topography: Tea/Jute in hilly areas.



How? → Diversification through MSP, government incentives, etc.

→ Discouraging water intensive crops like rice in stressed areas like Punjab

→ Encouraging multiple cropping, horticulture by bringing spices, fruits, vegetables under MSP.

With more than 50% population dependent on agriculture, a change in cropping patterns is necessary for sustainable agriculture.

12. While the budgetary reforms undertaken by the Central government in recent years have led to better management of government expenditure, there are some issues that still need redressal. Discuss. (250 words) 15

जहाँ हाल के वर्षों में, केंद्र सरकार द्वारा किए गए बजटीय सुधारों के कारण सरकारी व्यय का बेहतर प्रबंधन संभव हुआ है, वहीं कुछ ऐसे भी मुद्दे विद्यमान हैं जिनका समाधान किया जाना अभी बाकी है। विवेचना कीजिए।

The central government has taken various budgetary reforms in the past decade to ensure fiscal prudence and proper budget management.

- ① Outcome-Based Budgeting : For newly introduced schemes for better evaluation of results; and accordingly ^{the} release of funds for next year.
- ② Consolidation of Rail Budget into General Budget : Better coordination of Railway, Ports and Transportation ministries for infrastructural development schemes eg. National Infrastructure Pipeline.

- ③ Reducing Revenue Expenditure : Through
New Pension Scheme, austerity measures
relating to foreign trips, etc.
- ④ Adoption of technology: Through
Public Financial Management System (PFMS),
IndEA 2.0 stack, Government-e -
Marketplace, etc.
- ⑤ Procurement Models : Use of Quality-based
models rather than lowest cost (L1) model
for procurement.
- ⑥ New Investment Models introduced : BOT
for roads, PPP in airport are increasingly
given a push.
- ⑦ Increased capital expenditure : $\sim 30\%$.
Gross Fixed Capital Formation - GDP
ratio.

Issues needing redressal

- Reduction of cesses / surcharges by Centre
- Reduction in Non Lapsable Funds like MPLADS, Nirbhaya fund, etc.
- Reduction in extra budgetary borrowing (FCI procurement), etc.
- Reduced misuse of money bills (eg. Aadhaar Bill)
- Increasing the all time low productivity of parliament.

Recent budgetary reforms are laudable, but aforementioned issues need redressal.

13. For India to create a 'future ready' railway system, it must harness innovation and resource efficiency. Discuss the statement in the context of the measures enlisted in the National Rail Plan 2030. (250 words) 15

भारत को 'फ्यूचर रेडी' रेलवे प्रणाली के सृजन हेतु, नवाचार और संसाधन दक्षता का उपयोग करना चाहिए। राष्ट्रीय रेल योजना 2030 में सूचीबद्ध उपायों के संदर्भ में इस कथन की विवेचना कीजिए।

The National Rail Plan, 2030, aims to prepare the Indian Railways for the future - through technology, profits and modernization.

'Future Ready' Indian Railways

→ Improve Resource Efficiency:

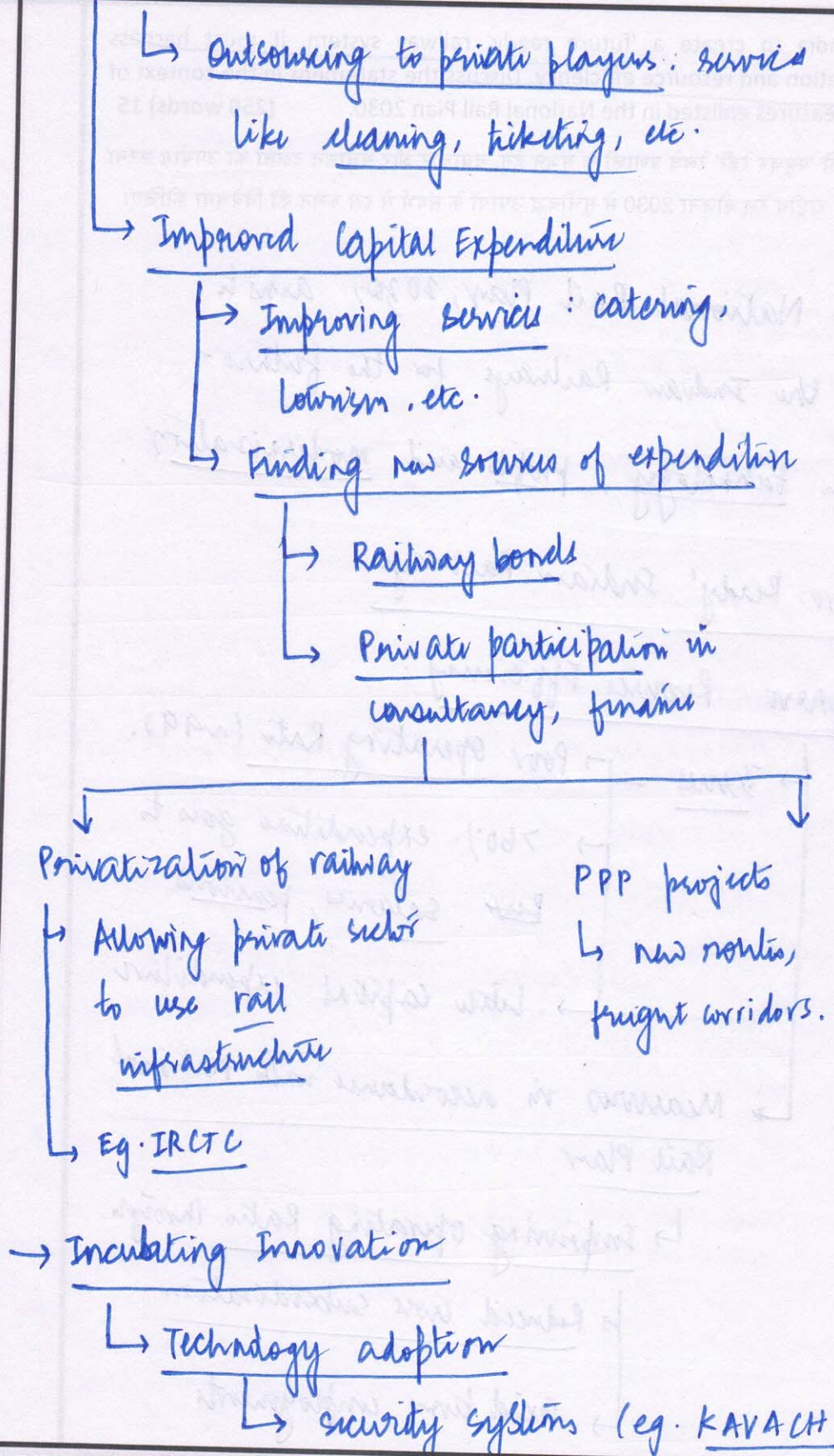
→ Issues -

- Poor operating Ratio (~99).
- 76% expenditure goes to pay salaries, pensions
- Little capital expenditure

→ Measures in accordance with National Rail Plan

↳ Improving operating Ratio through

- ↳ Reduced cross subsidization
- ↳ Fixed term employments



anti collision avoidance systems, fog removal from videos, etc.)

↳ Booking systems : crowd prediction, surge pricing, etc.

↳ Innovative Investment Models in Railways

like PPP, BOT, etc. to be encouraged.

↳ Station modernization, adoption of innovation in catering eg. use of Whatsapp for food delivery in trains (2015), etc.

The Railway Plan 2030 is a far sighted document that can propel railways into modernity and profitability.

14. Discuss the significance of technology in the Indian agricultural sector. Also, state the challenges in realising its potential to improve agricultural efficiency and increase the income of the farmers. (250 words) 15

भारतीय कृषि क्षेत्रक में प्रौद्योगिकी के महत्व पर चर्चा कीजिए। साथ ही, कृषि दक्षता में सुधार और किसानों की आय बढ़ाने की इसकी क्षमता का उपयोग करने में आने वाली चुनौतियों का भी उल्लेख कीजिए।

Technology has improved Indian agriculture since time immemorial: from the use of iron ploughshare in the later Vedic Times to the Green Revolution of the 1970s.

Significance of technology in agriculture

- ① Improving efficiency and reducing resource usage

→ Better irrigation systems → drip
→ sprinkler
↳ Reduced water requirement
(~30% of Indian districts are groundwater scarce)
→ Better fertilizer efficiency
eg. Nano urea liquid introduced by IFFCO.

② Improved crop yield

↳ use of GM crops like GM tomato in USA:
much higher yield.

③ Reduced crop risks

↳ Use of Bt-cotton in India : Resistance from
bollworm pest

↳ Early warning systems of droughts, rainfall,
etc: farmers make better decisions.

④ Empowering the farmer

↳ Improving decision making

↳ Soil Health card, Yield Prediction, etc.

↳ Kisan Vigyan Kendras, Kisan
Call Centres

↳ Increasing income

↳ cold storage facilities

↳ improved yield

Challenges in technology adoption

- Digital Divide → 50% Indians own smartphones, mostly in urban areas.
- Digital illiteracy → 74% women have only used internet. With feminization of agriculture, this hinders technology adoption (NFHS-5)
- Poor Extension service; last mile delivery of technology is poor in Eastern states
- Not farmer friendly
 - ↳ Apps not available in local languages
 - ↳ Farmer unaware of benefits of technology adoption.
- cynicism: Against adoption of 'foreign' technology.

Last-mile delivery of technological services to farmers will aid in doubling their income

15. Despite the digital transformation in the Public Distribution System (PDS) in India, several challenges still remain. Elaborate. Also, suggest measures to address them. (250 words) 15

भारत में सार्वजनिक वितरण प्रणाली (PDS) में डिजिटल रूपांतरण के बावजूद, अभी भी अनेक चुनौतियां विद्यमान हैं। सविस्तार वर्णन कीजिए। साथ ही, इनके समाधान हेतु उपायों का सुझाव दीजिए।

India has taken various steps to modernize the PDS system; however plenty of challenges still remain.

Digital Transformation of PDS

→ Aadhaar-based authentication and Aadhaar Enabled Payment System (AEPS)

↳ Use of Jan Aadhaar Mobile (JAM)

Leading to → Reduce leakage of subsidy
→ Reduce corruption in PDS systems.

→ Portals, eg. Annamitram Portal

↳ For better scheme monitoring and data analysis of PDS schemes.

- Use of Integrated Management of PDS system (IM-PDS) : For better coordination with states, better transparency in beneficiaries, etc.
- Fund Release : Use of Public Financial Management System (PFMS) for fund release to states.
- Empowering FCI : ~~For~~ By improving cold chain, warehousing technologies
- Potential of eRUPI : To reduce subsidy leakage and inclusion/exclusion issues.

Challenges

- Digital divide
- Financial exclusion of vulnerable households
- Lack of grievance redressal mechanisms

↳ Cooperative Federalism absent: Not all states on board

Way Forward

- ↳ Ensure both technological as well as conventional ways available: to reduce digital exclusion. eg. conventional authentication should be available alongside AEPs
- ↳ Bridge digital divide: Through extension services, Kisan Credit Cards, Universal inclusion of PMJDY (Jan Dhan Yojana), etc.
- ↳ eRUPI is implementation in PDS on war footing
- ↳ Grievance Redressal officers in every Tehsil.

Technology has proved to be a boon for PDS in reducing leakage and corruption, however, the forementioned steps can strengthen it further.

16. Discuss the various concerns that exist with regard to fuel efficiency regulations for vehicles in India. Also, suggest the measures that can be taken in this regard.

(250 words) 15

भारत में वाहनों के लिए ईंधन दक्षता विनियमों के संबंध में विद्यमान विभिन्न चिंताओं पर चर्चा कीजिए। साथ ही, इस संदर्भ में किए जा सकने वाले उपायों का भी सुझाव दीजिए।

Fuel and Corporate Efficiency for Vehicles

norms are a positive step towards pollution abatement in India. However, they suffer from certain limitations.

Fuel Efficiency Norms in India

- ① Fuel Efficiency: Amount of distance travelled for a litre of petrol/^{fuel} burned by a vehicle.

↳ Corporate Based Norms : In India, an automobile company needs to have an average fuel efficiency across all its models: meaning that some can be less fuel efficient; some can be more

→ These norms differ for petrol, diesel,
commercial, vehicles

→ They also differ among two / three / four
wheelers.

② Norms for personal vehicles once in possession

↳ Pollution check: needs to be done regularly
and pollution certificate needs to be procured.

③ Fuel Blending Norms: >E10 vehicles allowed
for manufacturing only. Goal is to switch to
E20 by 2025.

④ BS-IV and BS-VI norms: Direct transition
to BS-IV to BS-VI.

Concerns and Measures

① Strict BS-VI norms slowing down the
automobile sector

↳ Direct transition to BS-VI from BS-IV
has increased cost of vehicles.

Measures: Staggered transition to BS VI : validity of BS IV vehicles for 10-15 more years, subsidies, ^{tax incentives} on BS VI vehicles to reduce consumer cost

② Corporate Average Fuel Efficiency norms have loopholes and can be misused : since 'average' efficiency leads to some models being highly fuel inefficient.

Measures: Model specific norms - cap on ^{minimum} ~~maximum~~ efficiency, dynamic norms based on units sold.

③ Fuel Blending: Additional cost incurred on manufacturers, ultimately on consumers, to make cars B20 compliant.

While the fuel efficiency norms are laudable, concerns of the automobile industry must not be sidestepped.

17. Urban fire is becoming a serious cause of concern in Indian cities. In this context, highlight the major causes behind urban fires in India. What steps can be taken to build robust fire resilience in Indian cities? (250 words) 15

शहरी आग (अर्बन फायर) भारतीय शहरों में चिंता का एक गंभीर कारण बनती जा रही है। इस संदर्भ में, भारत में शहरी आग के प्रमुख कारणों पर प्रकाश डालिए। भारतीय शहरों में मजबूत अग्नि रोधी क्षमता के निर्माण हेतु क्या कदम उठाए जा सकते हैं?

The recent fire in Delhi's Mundaka
which led to the loss of over 30 lives
prompt a strong policy towards combating
urban fires in India.

Causes behind urban fires

① lax implementation of building codes

- faulty electricity wiring : short circuits
- use of flammable insulation, especially
- in sound proof locations like
theatres (Uphaar Cinema Tragedy)
- use of inflammable tarps, etc in
commercial establishments

② Inadequate safety measures : lead to quick spreading of fire :

- Close, cramped buildings → lead to fast fire spread especially in market areas.
- unavailability of fire extinguishers, sand buckets, etc.
- unavailability of emergency exits.

③ Lax Response

- Delayed firefighting response
- Resource crunched fire department

④ Urban Heat Island Effect

- ↳ Heat waves leading to more fires
eg. Ghaziपुर landfill fire during non Heat Wave.

Recent Examples

- Hyderabad coaching center fire (2018)
- Kolkata New Market Fire (2021)
- Delhi Ghaziपुर landfill fire (2021)

Measures Needed

→ Strict implementation of building bye-laws

- Through stringent NOC, licensing usage
- Regular inspections on buildings
- Strict action on unauthorized buildings

→ Training and awareness

- Allowing citizens to report buildings with lax fire safety measures
- Basic fire safety training in schools
- Women's participation (eg. Delhi Fire Service training female firefighters)

→ Modernisation of unauthorized colonies and markets.

→ landfill reclamation.

With climate change, the urban fires have become a grave threat demanding immediate attention.

18. Drones in border areas present a serious threat for border management in India. Elaborate. Also, discuss the different measures taken to regulate the use of drones in India. (250 words) 15

सीमावर्ती क्षेत्रों में ड्रोन, भारत में सीमा प्रबंधन के समक्ष एक गंभीर खतरा उत्पन्न करते हैं। सविस्तर वर्णन कीजिए। साथ ही, भारत में ड्रोन के उपयोग को विनियमित करने के लिए किए गए विभिन्न उपायों पर चर्चा कीजिए।

Drones, with their unmanned nature, swiftness and interception difficulty, are increasingly being weaponised on our borders.

The threat of drones on border areas

① Attacks

- Missiles / bombs can be placed on drones and dropped at the target
- Potential misuse for chemical / biological weapons as well.

② Intelligence leakage

- Drones can use mic / camera to intercept security discussions on border
- can be placed in discreet locations for continuous information leakage.

③ Fueling terrorism

- can be used to safely deliver messages to insurgents across the border.
- can supply arms to / drugs across border.

④ Mapping

- can be used to construct maps of ports and border areas through tether camera
- can be used to strategize and chart out an attack.

⑤ Interception difficult

- small size
- can use spoofing techniques
- stealth drones

⑥ Unmanned Nature

- Become a safer option to cause security issues across border.

⑦ Versatility: Drones can be fitted with camera, arms, IR Radars, etc.

Measures taken by India

① Drone Rules → Licensing requirements for drone flying

→ Red / Yellow / Green zones
↑
Restricted drone flying
(Border Areas, Airports, etc.)

② Indigenous Drone Development

→ Buy DRDO, etc. for defence purposes
→ Import restriction on drones.

③ Drone interception technology

→ GPS spoofing
→ Net / Harpoon capture
→ Fighter drones
Being introduced in Border Areas

④ Network Jamming : To prevent drone communication in border areas.

With the increasing usage of drones by Pakistan on our Northern Border, it is imperative that we improve drone interception and destroying capabilities.

19. Despite a global framework to prevent weaponization of space, it has been increasing in the recent times. Discuss. Also, give an account of the implications of space weaponization. (250 words) 15

अंतरिक्ष के शस्त्रीकरण को रोकने के लिए एक वैश्विक ढांचा होने के बावजूद, हाल के दिनों में इसमें वृद्धि हुई है। चर्चा कीजिए। साथ ही, अंतरिक्ष के शस्त्रीकरण के निहितार्थों का विवरण दीजिए।

The 'space race' is said to have introduced the next frontier of war : 'the space'.

Global Framework against weaponisation of space

→ Outer Space Treaty

- Peaceful use of space
- led by NASA
- India and China are not members
- Details
 - space debris issue
 - joint ownership of space resource
 - banned on space weaponisation

space weaponisation : use of space to threaten international peace and security.

Why its increasing

- Advancements in space sector
 - cost reduction
 - technical progress
 - miniaturisation satellites (eg. Starlink)
 - use of transfer orbits
- NO global framework
 - India/China not a part of Artemis Accords

Forms of weaponization : Wars of the future

- Space Debris being navigated to hit satellites
- Satellite-satellite clashes
- Satellites falling onto civilian areas (several near misses with India recently)
- Seizing control over communication/radar satellites

Implications of space weaponization

- Expensive warfare: Sending satellites is a huge expense. Mutual destruction would lead to huge economic loss.
- Kessler Effect: Space is getting strewn with debris, hence causing unsafe space travel
- Hampers human spaceflight and research in astronomy: since focus is more on space defence
- human cost in long run: space based warfare can wreak havoc on ground → loss of life.

We must settle on a common global framework to prevent space from becoming a new frontier of war.

20. What do you understand by a bio-economy? Highlight the role that the National Biotechnology Development Strategy 2021-2025 can play in creating a robust bio-economy in India. (250 words) 15

बायो-इकोनॉमी (जैव-अर्थव्यवस्था) से आप क्या समझते हैं? भारत में एक मजबूत बायो-इकोनॉमी के सृजन में राष्ट्रीय जैव प्रौद्योगिकी विकास रणनीति 2021-2025 द्वारा निभाई जा सकने वाली भूमिका पर प्रकाश डालिए।

Bioeconomy refers to the use of biotechnology to aid different industries, eg.
agriculture, transportation, etc.

Bio-economy

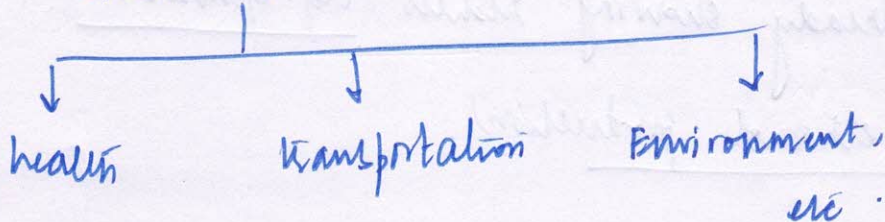
- Biofuels: Eg. ethanol, methanol etc.
generated from bio-sources like
sugar beets, sugarcane, maize,
etc.
- Use in health sector
↳ Eg. Nature based medicines
biodegradable nanobots, etc.
- Pollution Reduction
↳ Eg. Plastic eating bacteria,
oil spills cleanup
- Bioremediation

- ↳ sewage treatment
- Biogas: For sustainable, clean fuel source.
- Crop production: Biofertilizers, crop research, GM crops, etc.
- ↳ Traditional Medicine and Bio-Medicine
 - ↳ Research on medicinal herbs
 - ↳ Nature-based remedies eg. ~~turmeric~~ turmeric

Role of NBDS 2021-25

① Multidimensional coverage

↳ covers various sectors



② Emerging technologies

↳ eg. biovaccines, biomimicry, nanotechnology etc. included

in synergy with biotech. policy.

③ Inclusive Policy

- ↳ Participation of women in STEM
- ↳ Use of traditional knowledge (tribal)

④ Energy transition

- ↳ Biomass as a fuel (clean fuel)
- ↳ Biogas economy: cooking fuel,
useful in island areas like
Andaman and Nicobar Islands as
energy source.

④ Thus, the NBDS 21-25 can create
a robust bio-economy for India and
is already showing results Ceg-Generation
2,3 ethanol production.