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GENERAL STUDIES (TEST CODE : 2715)

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Medium Hindi/Eng.	ENGLISH	Registration Number	46100045
Center	ONLINE	Date	13/8/2025

INDEX TABLE

Q. No.	Maximum Marks	Marks Obtained
1	10	
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17	15	
18	15	
19	15	
20	15	

Total Marks Obtained:

Remarks:

Signature of Examiner

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 **HINDI & ENGLISH**
इसमें बीस प्रश्न हैं हिन्दी और अंग्रेजी 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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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. क्षेत्रीय कृषि विशेषज्ञताओं पर आधारित खाद्य प्रसंस्करण इकाइयां जमीनी स्तर पर परिवर्तन को किस प्रकार सुगम बना सकती हैं? भारत के विभिन्न क्षेत्रों से उपयुक्त उदाहरणों के साथ चर्चा कीजिए।

How can food processing units based on regional agricultural specializations facilitate grassroots-level transformation? Discuss with suitable examples from different regions of India. (Answer in 150 words) 10

Regional food processing specialization can lead to structural transformation benefitting food processing sector of India.

Regional specialization can transform food processing at grassroots

- ① Increases marketability of & produce due to specialized products.
- ② Creates local brand value and increases specific consumer demand
- ③ Creates local forward and backward linkages with farmers and retailers creating economies of agglomeration
- ④ Helps promote investment in agriculture

leading to development of produce

Examples from India

① Makhana cultivation → 90% in Bihar → helped in setting up local food processing has led to India being largest exporter of makhana goods
↳ Also created brand value as "superfood"

② Millets in Rajasthan → Increased investment by food processing chains have led to developments in cultivation technology
↳ Increased yield & farmer income

③ Coffee plantations in Western Ghats set up specialized units to ground coffee
↳ lowered costs and increased coffee demand

Hence local level partnership can benefit farmers as well as industries.

2.

चर्चा कीजिए कि डिजिटलीकरण भारत में समावेशी विकास के प्राथमिक चालक के रूप में किस प्रकार उभरा है।

Discuss how digitization has emerged as the primary driver of inclusive growth in India. (Answer in 150 words) 10

Digitization of Indian economy has played a key role in increasing equity and promoting social mobility leading to inclusive growth.

Digitization has emerged as the primary driver of Indian Economic growth

- ① Has helped improve service quality and delivery of public institutions
- ② DBT has led to efficient benefit transfer → ₹ 2.22 L Cr leakage avoided
- ③ Helps bridge geographical divides → Increased rural penetration of telecom has bridged digital divides
- ④ Increases accessibility of social welfare schemes

eg Digital registration of Ayushman Bharat

→ enrolled 36 Cr people

④ Has improved human capital development
by skilling & educational reform

eg Digital curriculum in NEP → leads to
digital literacy and skill formation of youth

⑤ Has created new sections of employment
formation and economic empowerment

eg Tertiary IT sector → led to rise in
employment of skilled workers
promotes social mobility

Hence digitization has allowed
government policy to reach every
person in the country.

3.

डिजिटल कृषि मिशन भारत में किसानों के जीवन को रूपांतरित करने के लिए किस प्रकार प्रौद्योगिकी का लाभ उठाता है? प्रासंगिक उदाहरणों के साथ अपने उत्तर की पुष्टि कीजिए।

How does the Digital Agriculture Mission leverage technology to transform the lives of farmers in India? Substantiate your answer with relevant examples.
(Answer in 150 words) 10

Digital Agriculture helps correct deficiency and issues of farmers by $\frac{1}{2}$ using technology to promote their welfare.

It can transform farmers lives by

① Reducing resource consumption

↳ AI soil monitoring helps optimize fertilizer usage → saving costs while increasing yields

② Promoting better vigilance and monitoring of crops

↳ IoT drones can spot pest attacks and crop disease

③ Improves agricultural techniques by information dissemination

↳ KLSAN e-mitra → Chatbot that

Supplies cultivation advice to farmers

④ Improves supply chain efficiency
using blockchain

Ex Kerala's coffee industry uses blockchain
based supply chain monitoring

⑤ Increases crop marketability leading
to greater demand

Ex e-NAM → one-window location for
agricultural marketing

⑥ Helps transparent and speedy benefit
delivery

Ex PM JOY & PM KISAN → Lead to DBT
for fertilizer and seed purchase

Hence digital agriculture improves
grassroot-level agricultural issues and
promotes farmer welfare.

4. भारत में नवीकरणीय ऊर्जा के लिए नई औद्योगिक अवसंरचना स्थापित करना एक कठिन कार्य है। सरकार इस उभरते क्षेत्रक में निजी क्षेत्रक की भागीदारी को प्रोत्साहित करने की क्या योजना बना रही है?

Setting up new industrial infrastructure for renewable energy in India is a daunting task. How does the government plan to encourage private sector participation in this emerging sector? (Answer in 150 words) 10

High initial costs and risky nature of renewable ventures have led to challenges in increasing industrial infrastructure for renewable energy.

It is a daunting task to set this up

- ① High capital costs create financial risk in starting up factories
- ② Supply chain risks → Rare earths are monopolized by China but are crucial in manufacturing renewable technology
- ③ Uncertain demand → Impacts probability of industrial ventures as low demand will lead to revenue shortfall
- ④ Inadequate skilling of labour force

leads to slow innovation and progress

Govt plans to increase private sector participation

- ① Viability gap funding helps bridge initial costs in setting up solar parks and wind farms
- ② RPOs ensure baseline demand for power output and promote profitability of ventures
- ③ National Critical Minerals Mission will lead to assured supply of raw materials encouraging private partnership
- ④ Skilling schemes like PM KUY help supply qualified labour force capable of engaging in industrial entrepreneurship

Hence government-backed assurances will help increase private sector confidence in industry-building.

5.

वैश्विक स्तर पर कच्चे तेल की बढ़ती कीमतों के भारत के लिए प्रमुख समष्टि आर्थिक (Macroeconomic) परिणाम क्या हैं?

What are the key macroeconomic consequences of rising global crude oil prices for India? (Answer in 150 words) 10

India is dependent on crude oil imports for 85% of its needs which creates global pricing risks for India.

Macroeconomic consequences of Rising Prices

- ① Creates larger trade deficit which hurts foreign exchange reserve levels
- ② Negatively impacts GDP as industries dependent on crude oil will slow down by price hikes
- ③ Leads to supply-side inflation as rising crude prices increase manufacturing costs.
- ④ Reduces logistics efficiency and will increase already high cost

of logistics (13-14% vs 8% global average)

⑤ Will increase unemployment in secondary and tertiary sector and impact citizen welfare

⑥ Can lead to rising national debt to finance more expensive imports

⑦ Hinders economic development progress by reducing investments
↳ Funds diverted to finance imports.

Hence India is vulnerable to global crude price shocks as has been seen in the 1980s Oil Embargo.

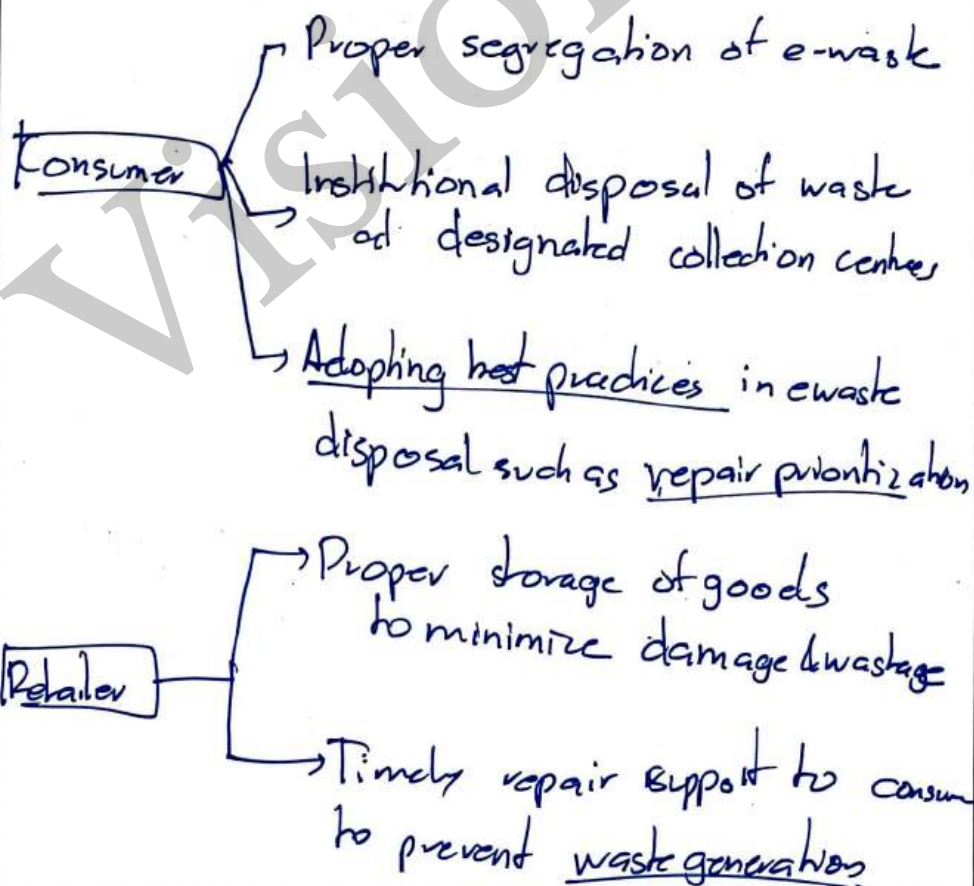
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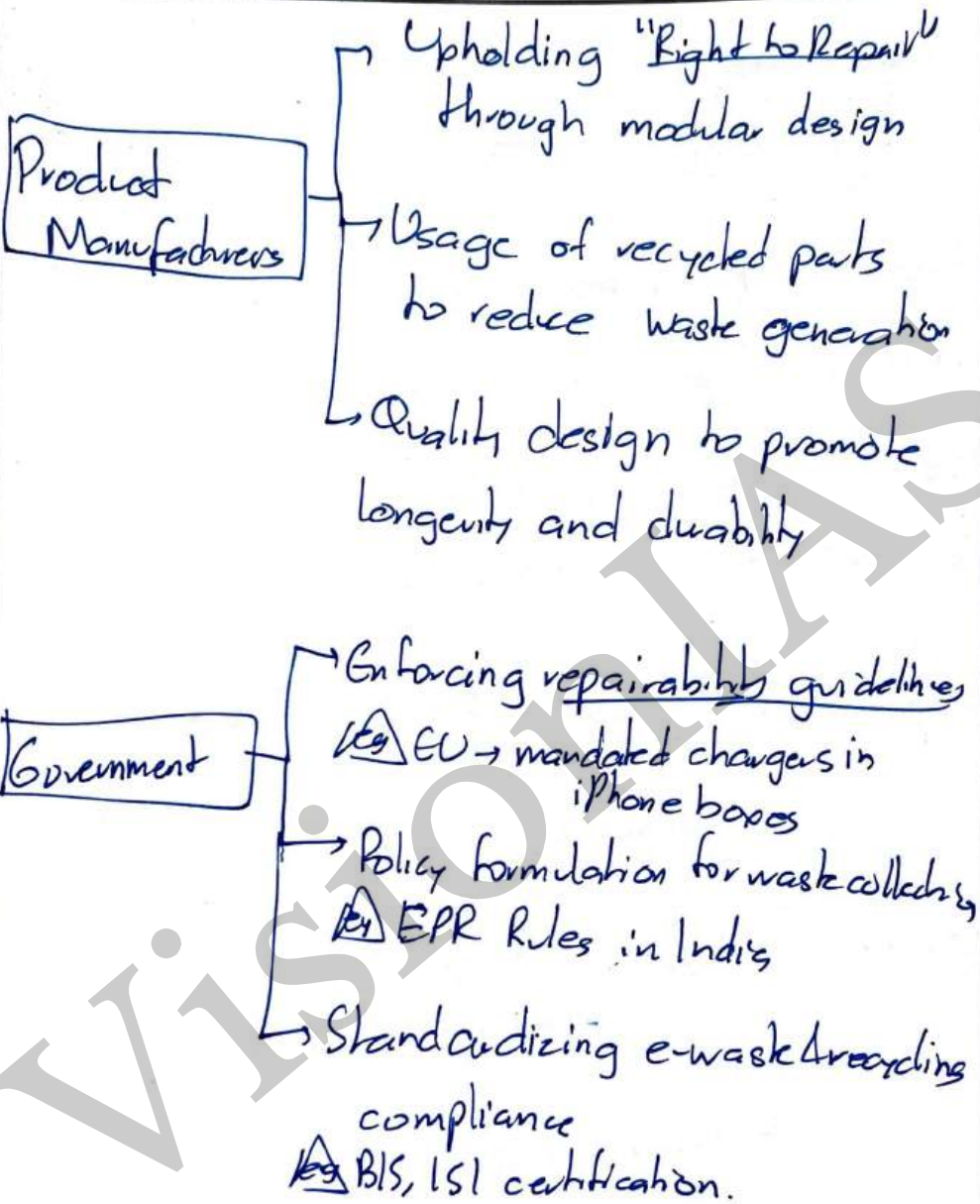
ई-अपशिष्ट प्रबंधन केवल कॉर्पोरेट उत्तरदायित्व नहीं है, बल्कि इसकी शुरुआत घर से होती है। इस संबंध में विभिन्न हितधारकों के उत्तरदायित्वों का वर्णन कीजिए।

E-waste management is not just a corporate responsibility, but it starts at home. Delineate the responsibilities of different stakeholders in this regard. (Answer in 150 words) 10

While EPR rules help reduce corporate e-waste generation, consumers must also maintain standard practices to combat e-waste generation.

Responsibilities of Different Stakeholders





A coordinated strategy is key to reducing e-waste generation in India.

7.

भारत में सूखा शमन के प्रयासों को सुदृढ़ करने के लिए उभरती प्रौद्योगिकियों का लाभ किस प्रकार उठाया जा सकता है?

How can emerging technologies be leveraged to strengthen drought mitigation efforts in India? (Answer in 150 words) 10

More than 50% of India's land is prone to drought. Risks are increasing due to erratic monsoons and glacier melting by climate change.

Role of emerging technology in drought mitigation

- ① Micro-irrigation technology protects water resources and reduces over exploitation.
- ② Novel techniques such as bio-flocculation help wastewater treatment - promoting recycling of sewage water.
- ③ AI flow monitoring helps detect

pipe leaks in urban infrastructure

④ Seed development and gene editing

create water-efficient crop varieties
promoting "Per drop more crop" principles

⑤ Traditional infrastructure technology like
bunds are augmented with bioplastics
to reduce contamination and evaporation.

⑥ Water reclamation systems in industries
preserve water for reuse in power plants

⑦ IoT-based weather monitoring
helps track rain and allows timely
preparation for drought

Hence technology plays a significant
role in mitigating adverse effects of droughts

8.

प्रो. जयंत नार्लीकर और सर फ्रेड हॉयल द्वारा विकसित 'हॉयल-नार्लीकर गुरुत्वाकर्षण सिद्धांत' को संक्षेप में स्पष्ट कीजिए। इसने ब्रह्मांड की उत्पत्ति और नियति पर समकालीन चर्चा को किस प्रकार प्रभावित किया?

Briefly explain the 'Hoyle-Narlikar Theory of Gravity' developed by Prof. Jayant Narlikar and Sir Fred Hoyle. How did it impact the contemporary discourse on the origin and fate of the universe? (Answer in 150 words) 10

The Hoyle Narlikar theory of gravity was developed to show a theory of gravity.

Explanation

- ① Defined gravity as an attractive force between masses
- ② Tried to account for quantum phenomena in gravity
- ③ Established connections with other fundamental forces and effects
- ④ Accounted for finite speed of gravitational waves as mentioned in Einstein's theory of General Relativity

Role in shaping contemporary discourse

- ① Important tool for discussing state of early universe during big bang
- ② Provides insight into detailed gravitational phenomena near big bang.
- ③ P. Suggests heat death model for fate of universe
 - ↳ Gradual decline in stellar activity
 - ↳ ^{and} Expansion of universe leads to cooling
 - ↳ Maximum entropy principle will lead to homogenized matter distribution

Hence the Hoyle-Narlikar Theory is a significant progress in understanding gravitational phenomena of our universe.

9. भ्रामक खबरों (फेक न्यूज़) का प्रसार राष्ट्रीय सुरक्षा के लिए किस प्रकार खतरा उत्पन्न करता है? इस चुनौती से निपटने के उपायों पर चर्चा कीजिए।

How does the spread of fake news pose a threat to national security? Discuss the measures to counter this challenge. (Answer in 150 words) 10

Fake news has increased online by more than 3x times since 2020. This impacts reliability and factual information dissemination online.

It poses a threat to national security

- ① Targetted fake news can lead to radicalization of youth for terrorist acts.
 (eg) Anti-immigrant violence in USA by fake news.
- ② Can undermine institutional integrity and public trust in government
- ③ Divert public opinion toward malicious acts to create distractions
- ④ Create online "echo chambers" and influence thought & action of vulnerable people
 (eg) Online ~~engagement~~ engagement → led depressed

man to lead school shooting in USA

Measures to Counter

- ① Institutional information disclosure platforms such as PIB
→ Helps establish reliable information source
- ② Legal safeguards such as Section 66 of IT Act
→ Promotes regulation of misleading content
- ③ Online outreach to social media companies
→ "Community Notes" on X leads to fact-checking of fake news
- ④ Monitoring of online vested interests through social media intelligence (SOCMINT) and dark web monitoring

Hence social media ~~must be~~ and online forums must be subject to scrutiny to minimize impact of fake news.

10. स्पष्ट कीजिए कि भारत को अंतर्राष्ट्रीय संगठित अपराधों (TOC) से निपटने में किस प्रकार विभिन्न चुनौतियों का सामना करना पड़ रहा है। इस खतरे से निपटने के लिए किए जा रहे उपायों पर टिप्पणी कीजिए।

Explain how India faces numerous challenges in combating Transnational Organized Crime (TOC). Comment on the measures being taken to counter this threat. (Answer in 150 words) 10

Transnational organized crime poses a difficult challenge for India's security goals.

Challenges in combating TOC

- ① Foreign state support such as Pakistan in Kashmir undermines cooperation to mitigate threats.
- ② Use of digital medium like encrypted group chats and cryptographic messaging → Prevents tracking criminals
- ③ Global financing of organized crime through money laundering and "cypho hawala"
→ Hampers limited jurisdiction to tackle challenges.

- ④ Differing foreign policy such as Switzerland's stringent privacy leads to blocking of efforts to seize illegal assets

Measures taken to counter

- ① International organization participation
↳ FATF helps unite different jurisdictions for common action.
- ② Extradition agreements such as with UAE to ~~help~~ enforce law on "expat criminals"
- ③ Legislative reform → NIA Act amendment brings transnational crimes in jurisdiction
- ④ Banking reform to block foreign transfer of illegal wealth

Hence TOCs can be combatted only with global cooperation and reform.

11.

आहार विविधता, मृदा स्वास्थ्य और संधारणीय कृषि सुनिश्चित करने में दालों के महत्व का परीक्षण कीजिए। इन फसलों के उत्पादन और विपणन के संदर्भ में किसानों को किन चुनौतियों का सामना करना पड़ता है?

Examine the significance of pulses in ensuring dietary diversity, soil health, and sustainable agriculture. What challenges do farmers face in terms of production and marketing of these crops? (Answer in 250 words) 15

Pulses are an important part of nutrition for Indian citizens and help to cover deficient needs of protein in Indian diet.

Significance of pulses

Dietary diversity

① Vital source of proteins

↳ Indian diet is deficient in protein

② Important source of dietary

fibre and roughage

↳ Promotes healthy digestive function

③ High concentration of micronutrients like vitamin and minerals is beneficial

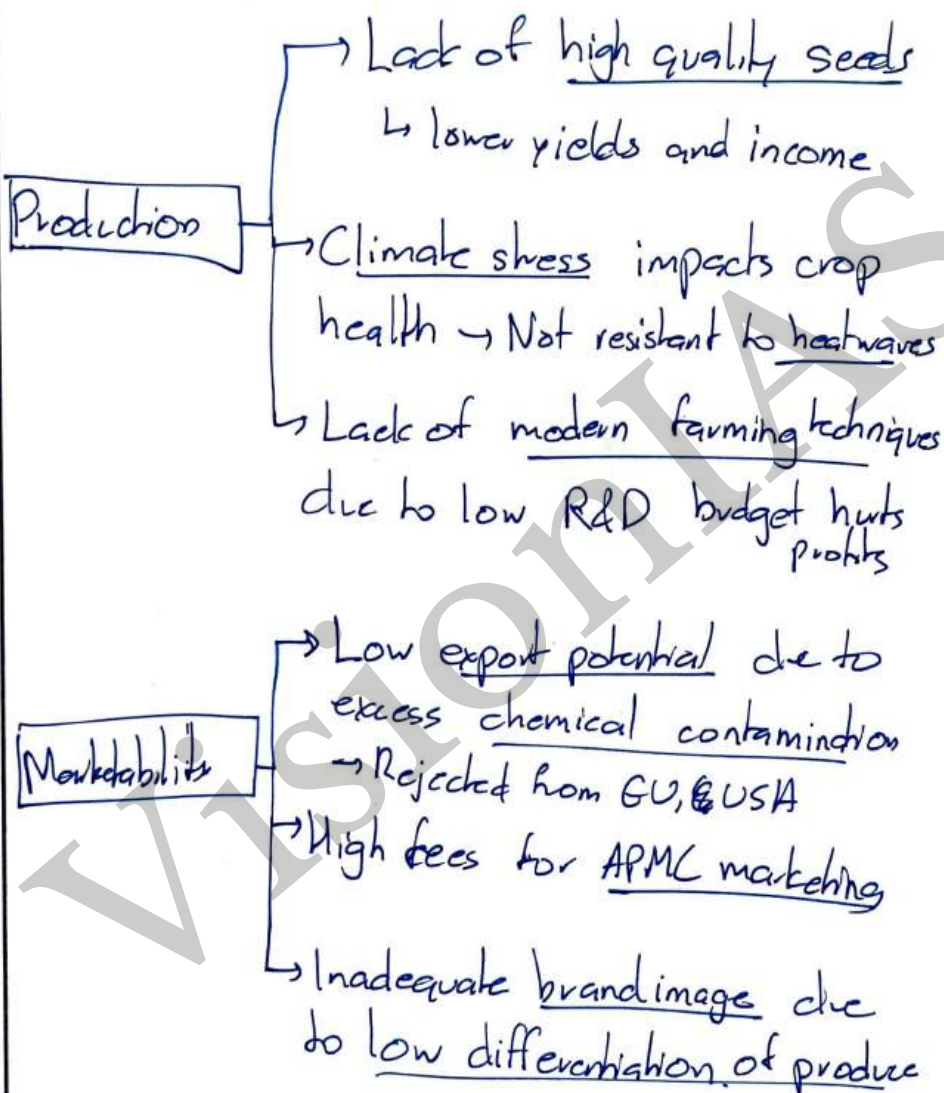
Soil Health

- ① Leguminous nature promotes nitrogen fixation of soil
- ② Improves microbial profile of soil by symbiosis → leads to greater biological productivity
- ③ Lesser water requirement combats water scarcity in soil

Sustainable Agriculture

- ① Multicropping of pulses with cereals leads to greater crop production and yield
- ② Combats soil degradation by restoring biodiversity in soil microbes
- ③ Prevents ^{soil} resource depletion by its low nutrient demand
→ Conserves soil potential and increases it

Challenges faced by farmers



Improving India's pulse production is crucial to food security and health profile enhancement.

12.

भारत में विमानन क्षेत्रक द्वारा सामना की जाने वाली सुरक्षा संबंधी चुनौतियां क्या हैं? इस संदर्भ में, भारतीय वायुयान अधिनियम, 2024 के प्रमुख प्रावधानों पर चर्चा कीजिए।

What are the safety challenges faced by the aviation sector in India? In this context, discuss the key provisions of The Bharatiya Vayuyan Adhiniyam, 2024.
(Answer in 250 words) 15

The Aviation Industry faces numerous safety issues as highlighted by the recent Air India Crash.

Challenges faced in Safety

- ① Outdated airplane fleet such as Boeing Dreamlines → known security vulnerabilities.
- ② Inadequate security checks at most airports lead to potential for terrorist attacks.
- ③ Lack of codified norms for pilot conduct lead to inappropriate response to emergencies.

- ④ Inadequate mandated rest for pilots due to lax norms lead to pilot fatigue and overwork causing safety risks
- ⑤ Vacancies in DGCA regulatory staff lead to shortage of manpower for investigating and enforcing guidelines.

The Bharatya Vyayan Adhiniyam 2024 helps to combat this by

- ① Specifying global best practices in security guidelines
- ② Mandating security audits of airports to ensure proper vigilance
- ③ Power to enforce rules and take punitive action for violation of rules.

- ④ Periodic aircraft audits to ensure no safety issues are present.
- ⑤ Guidelines for proper training and mock drills to train staff.

Hence this is a good step to reform India's safety architecture in airline industry.

13.

पिछले कुछ वर्षों में रुपये के मूल्य में होने वाली तीव्र गिरावट के लिए कौन-से कारण उत्तरदायी हैं? भारतीय अर्थव्यवस्था के संबंध में रुपये के अवमूल्यन के लाभ और हानियों पर चर्चा कीजिए। मुद्रा अस्थिरता को प्रबंधित करने के लिए RBI द्वारा उपयोग किए जाने वाले उपकरणों पर प्रकाश डालिए।

What are the causes for sharp depreciation in the value of rupee in the last few years? Discuss the merits and demerits of rupee depreciation on the Indian economy. Highlight the tools used by the RBI to manage currency volatility.
(Answer in 250 words) 15

Recent rupee depreciation has sparked concern about devaluation and economic impacts of reduced value of rupee.

Causes
of
depreciation

Rising US dollar price due to Trump policies leading to investor pull out

Geopolitical incidents such as Russo-Ukraine War impact industrial resilience

Monetary policy of Central Govt prioritizing export competitiveness

Reversing of FDI to China, Indonesia due to lower production cost

Impact of Rupee depreciation

Merits

- ① Improves export competitiveness
- ② Lower value reduces international export price → leads to balancing trade deficit.
- ③ Promotes industrial growth
- ④ Promotes FDI due to higher value of foreign currency

Demerits

- ① Increases burden of imports
- ② Decreases value of sovereign wealth → critical imports like oil become expensive
- ③ Reduces citizen purchasing power
- ④ Makes foreign investment more expensive and hurts business expansion.

RBI uses various tools to manage rupee ~~to~~ volatility

- ① Measures like currency purchase of US dollars to reduce oversupply of trading to rupee depreciation.

- ② Stabilization helps to negate foreign currency value manipulation
- ③ Open-Market Operations change supply of rupees in market and balance volatility
- ④ Foreign Exchange Reserves hold wealth to tackle over and under supply of rupees
- ⑤ Currency swap agreements help increase foreign currency buffers to tackle shocks in forex market

Hence currency depreciation has both benefits and drawbacks that are managed by the RBI's monetary policy.

14.

भारत में भूमि प्रशासन को बेहतर बनाने में डिजिटल इंडिया भूमि अभिलेख आधुनिकीकरण कार्यक्रम (DILRMP) के तहत भूमि अभिलेखों के डिजिटलीकरण की भूमिका का परीक्षण कीजिए। इसके कार्यान्वयन में आने वाली प्रमुख चुनौतियां क्या हैं?

Examine the role of digitization of land records under the Digital India Land Records Modernization Programme (DILRMP) in improving land governance in India. What are the key challenges in its implementation? (Answer in 250 words) 15

The DILRMP is a crucial component of introducing land reforms and establishing proof of ownership of agricultural and commercial land.

Role of DILRMP in improving land governance

① Reduces land disputes by maintaining online records for public use
↳ 50% of litigation is land disputes

② Increases policy making efficacy by land data analytics
↳ Helps promote sustainable development of land.

- ③ Aids land zoning and hazard mapping in rural and urban areas
- ④ Upholds ownership & rights of citizens and prevents illegal takeover of land.
- ⑤ Helps streamline land acquisition for infrastructural projects.

However it suffers from challenges

- ① Cyber security risks create issues in data validity and security
eg Kaveri 2.0 data breach in Karnataka
- ② Low digital literacy in rural regions hampers access to digital land records
- ③ Improper demarcation of ownership boundaries leads to overlap of

land ownership → causes litigation

④ Inadequate state participation due
to allegations of central overreach
↳ Agriculture → state list topic

⑤ Infrastructural gaps → Lack of adequate
storage and performant data centres
to store huge amount of land
information.

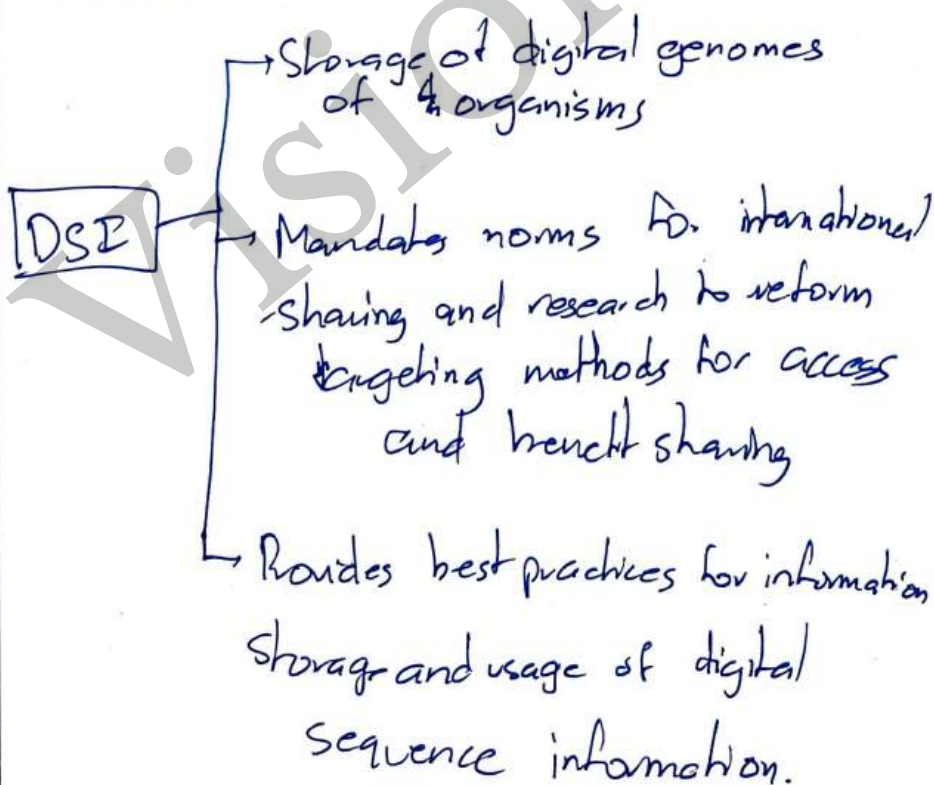
Hence hence careful implementation
and efficient usage of land record
digitization is necessary.

15.

जैव विविधता पर कन्वेंशन के नागोया प्रोटोकॉल के तहत पहुंच और लाभ साझाकरण (ABS) समझौते के संदर्भ में, डिजिटल अनुक्रम सूचना (DSI) क्या है? डिजिटल अनुक्रम सूचना, ABS के प्रबंधन की पारंपरिक पद्धति को किस प्रकार जटिल बनाती है? इस आलोक में, नए जैव विविधता (पहुंच और लाभ साझाकरण) विनियमन 2025 के प्रावधानों को रेखांकित कीजिए।

In the context of Access and Benefit Sharing (ABS) agreement under the Nagoya Protocol to the Convention on Biological Diversity, what is Digital Sequence Information (DSI)? How does DSI complicate the traditional method of managing ABS? In this light, delineate the provisions of the new Biological Diversity (Access and Benefit Sharing) Regulation 2025. (Answer in 250 words) 15

Access and Benefit Sharing is a highly initiative to allow Digital Sequence of Information to reform existing issues in Convention on Biological Diversity,



It creates complications in traditional ABS management

- ① Creates data security risks due to cyberattacks
- ② Leads to offshoring of data which undermines current interests.
- ③ Significant lack of resources for Biodiversity Management will lead to slow adoption of digital technology
- ④ High storage requirements due to large costs hamper widespread adoptions especially by developing nations.

Biological Diversity (Access and Benefit Sharing) Regulation 2023

- ① India's response to implement DSJ

in its biodiversity efforts.

- ① Mandates independent authority to oversee and manage DSI implementation
- ② Specifies information sharing norms for ABS system.
- ④ Promotes institutional cooperation with international standard organizations while managing national efforts

Hence India must take prompt and suitable action to manage ABS under DSI.

16.

बढ़ते तापमान, कमजोर अवसंरचना और खराब नियोजन के कारण शहरी आग को नियंत्रित करना कठिन होता जा रहा है। इस आपदा के कारणों पर चर्चा कीजिए। भारत में पिछले दो दशकों में घटित हुई इस तरह की आग की दो बड़ी घटनाओं की विशेषताओं का उल्लेख कीजिए। साथ ही, भारत में ऐसी नीतियों और तंत्रों का वर्णन कीजिए जिनका उद्देश्य ऐसी आग से निपटना है।

Urban fires are becoming difficult to control due to growing temperatures, failing infrastructure, and poor planning. Discuss the causes of this disaster. Mention the features of two such major fires in the last two decades in India. Describe the policies and frameworks in India that aim at tackling such fires. (Answer in 250 words)

15

Climate change and poor infrastructure development have led to increasing fire risk for urban centres of India.

Causes of Urban fires

- ① Poor urban planning → Unplanned urban growth causes congestion and increases fire risk
- ② Urban heat islands due to concretization increase risk of trees/shrubs catching fires.
- ③ Failing electrical infrastructure leads to exposed wires and creates electrical fire hazards.

- ④ Firefighting departments lack modern equipments like Halon gas which leads to fire spread
- ⑤ Improper coverage of fire extinguishers and firefighting stations leads to increased response times

Major Fire Incidents of India

- ① Tamil Nadu firecracker factory explosion. Caused by
- ↳ Deficient fire hazard preparedness
 - ↳ Proximity to residential areas.
- ② Ahmedabad factory fires led to large number of worker deaths caused by
- ↳ No fire evacuation plan
 - ↳ Congestion leading to inability of fire trucks to approach
 - ↳ Poor electrical cabling leading to fire.

Policies and frameworks of govt

- ① Improved technology of fire stations and specialized urban fire training improves preparedness
- ② Heat Action Plans such as in Ahmedabad combat growing temperatures by providing green cover and shade
- ③ Urban planning regulations enforce evacuation planning of city blocks
- ④ Building regulations of govt enforce fire exits and central staircases to ~~tech~~ allow quick evacuation

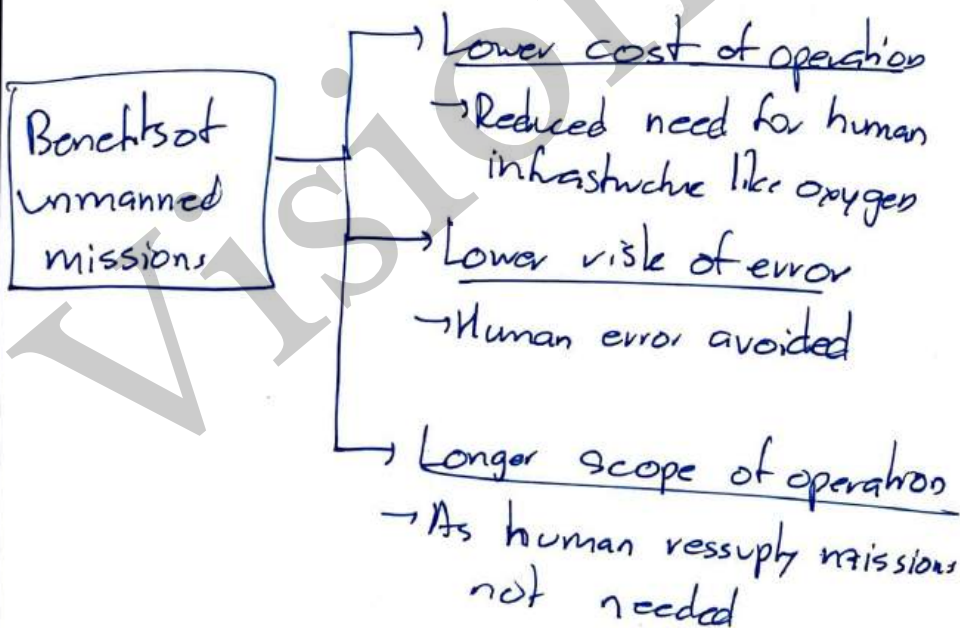
Hence fire preparedness is key for reduced risk of urban fires in India.

17.

वर्तमान में बिना चालक दल वाले मिशन बहुत कम लागत और जोखिम पर अधिकांश उद्देश्यों को पूरा कर लेते हैं। इस पृष्ठभूमि में, चालक दल वाली अंतरिक्ष उड़ान जारी रखने के औचित्य का परीक्षण कीजिए। यह भी आकलन कीजिए कि एक्सिओम-4 (Axiom-4) मिशन में भारत की भागीदारी प्रस्तावित भारतीय अंतरिक्ष स्टेशन (BAS) के विकास को किस प्रकार प्रभावित कर सकती है।

Uncrewed missions now accomplish most objectives at far lower cost and risk. In this backdrop, examine the rationale for continuing crewed spaceflight. Also assess how India's participation in the Axiom-4 mission could influence the development of the proposed Bharatiya Antariksh Station (BAS). (Answer in 250 words) 15

The rise of unmanned satellites and digital guidance has reduced human risk and requirement in space missions.



Yet manned spaceflight is relevant and important to space missions.

- ① Scientist crew members perform space experiments
 - ↳ Increase knowledge of space effects
- ② Physiological monitoring of effects on human body
 - ↳ Facilitates development of space-centric infrastructure
- ③ Paves way for further space settlement and human space expansion
 - ↳ Mars settlements of humans
- ④ Crucial for situational decisionmaking if equipment fails
 - ↳ Human role saved Apollo 13 disaster

India's ~~part~~ participation in the Axiom 4 mission has positives for developing BAs

- ① Increased experience of spaceflight

assists development of training centres

- ② Technology sharing allows local capacity building for space technology
- ③ Global cooperation helps increase funding and support for building BAS later on
- ④ Studying human impact of spaceflight helps develop safe and reliable human spaceflight rockets &

Hence Axiom 4 has provided vital resources and experience for India's to continue on its aim for the BAS.

18.

अगली पीढ़ी की सैटेलाइट इंटरनेट सेवाओं के लिए उपयोग की जा रही लो अर्थ ऑर्बिट (LEO) कांस्टेलेशन प्रौद्योगिकी क्या है? इसके कार्य सिद्धांत की व्याख्या कीजिए, भूस्थिर प्रणालियों पर इसके लाभों को सूचीबद्ध कीजिए और इसके समक्ष आने वाली प्रमुख सीमाओं का उल्लेख कीजिए।

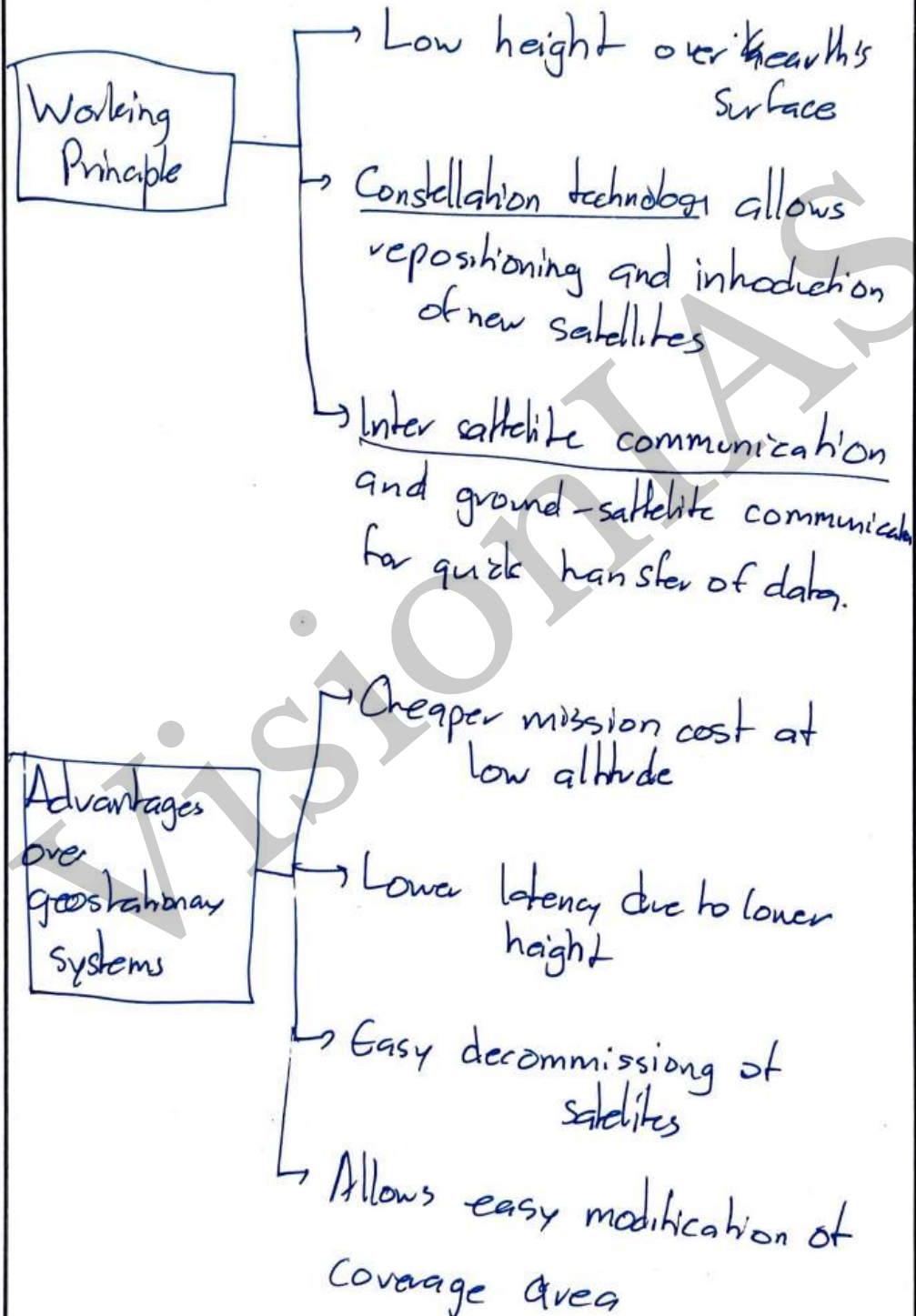
What is the low-Earth-orbit (LEO) constellation technology being employed for next-generation satellite internet services? Explain its working principle, enumerate its advantages over geostationary systems, and mention the major limitations it still faces. (Answer in 250 words) 15

Low earth orbit constellations like Starlink form the core of modern satellite infrastructure and internet services.

Reasons for LEO usage

- ① Cheaper missions → due to lower requirement of fuel
- ② Avoids space junk present at geostationary altitude
↳ Also allows easy decommissioning
- ③ Reduces latency due to lower communication time with surface
- ④ Allows flexible repositioning and

modification of coverage area.



However it faces issues

- ① High assembly time requiring multiple missions to deploy thousands of micro-satellites
- ② Navigation overhead to avoid collisions causes increased mission cost and collision risks.
- ③ Failure of communication nodes creates long delays as space launch required to restore
- ④ Expensive installation leads to high launch rates → impact profitability

LEO constellations possess the future of satellite internet but also pose challenging issues

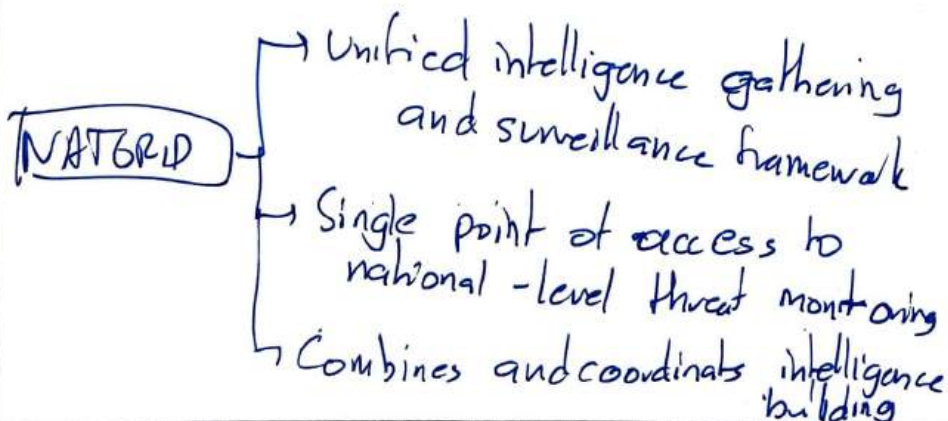
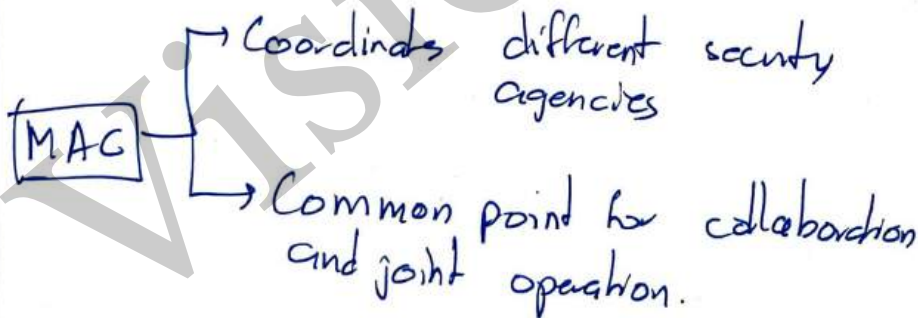
19.

खुफिया जानकारी साझा करने में मल्टी-एजेंसी सेंटर (MAC) और नेटग्रिड (NATGRID) की क्या भूमिका है? वास्तविक समय के खतरों से निपटने में इनकी प्रभावशीलता का आकलन कीजिए तथा डेटा सुरक्षा और अंतर-एजेंसी अनुक्रियाशीलता, दोनों को बेहतर बनाने के उपायों को प्रस्तावित कीजिए।

What is the role of the Multi-Agency Centre (MAC) and NATGRID in intelligence sharing? Assess their effectiveness in tackling real-time threats and propose measures to enhance both data security and inter-agency responsiveness.
(Answer in 250 words) 15

MAC and NATGRID facilitate
Coordinated sharing of information
and simultaneous monitoring and
cooperation in internal security.

Role in Intelligence Sharing



Effectiveness in tackling real-time threats

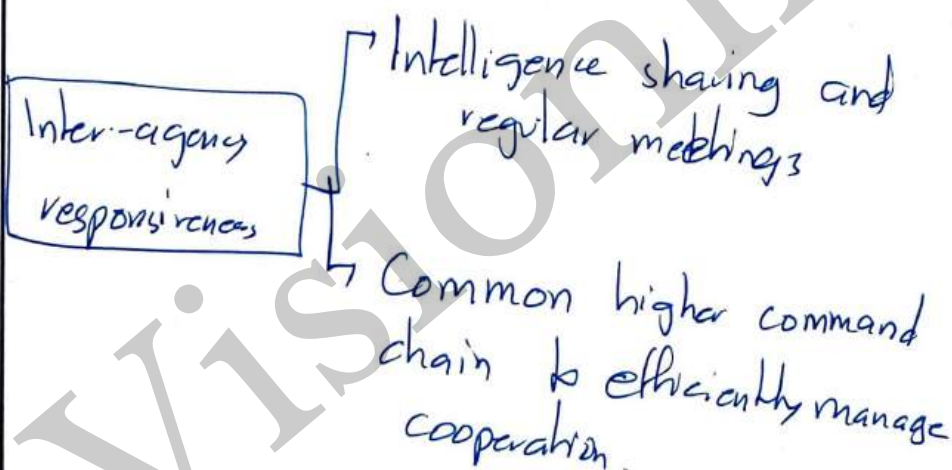
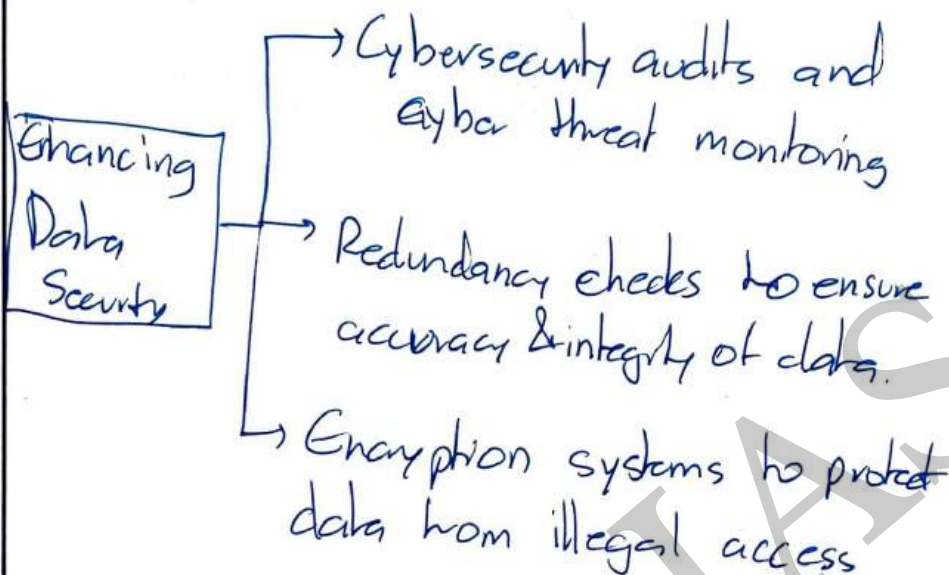
① Benefits

- Allow theatized command for coordinated operations
- Common intelligence base helps ensure reliable and complete information
- Reduces response time to real-time threats by common collaboration

② Drawbacks

- Overlapping jurisdiction creates inefficient change of command
- Cybersecurity risks threaten integrity of NATO/RID data

Hence measures are required to enhance data security and inter-agency responsiveness.



Hence improvements are required to tackle issues of national security.

20.

पारंपरिक हवाला के साथ पीयर-टू-पीयर क्रिप्टोकॉरेसी के अभिसरण ने एक अपारदर्शी अंतरराष्ट्रीय मूल्य-हस्तांतरण नेटवर्क का निर्माण किया है। परीक्षण कीजिए कि यह क्रिप्टो-हवाला गठजोड़ किस प्रकार कार्य करता है और यह भारत की धन-शोधन रोधी और आतंकवाद-वित्तपोषण रोधी व्यवस्था के लिए चुनौतियां क्यों उत्पन्न करता है। साथ ही, इस संदर्भ में अब तक उठाए गए कदमों पर चर्चा कीजिए।

The convergence of peer-to-peer cryptocurrencies with traditional hawala has created an opaque transnational value-transfer network. Examine how this crypto-hawala nexus operates and why it poses challenges for India's anti-money-laundering and counter-terrorist-financing regime. Also, discuss the steps taken so far. (Answer in 250 words)

15

The unregulated nature of crypto-networks has led to "crypto-hawala" networks facilitating money laundering and financing illegal activities in India.

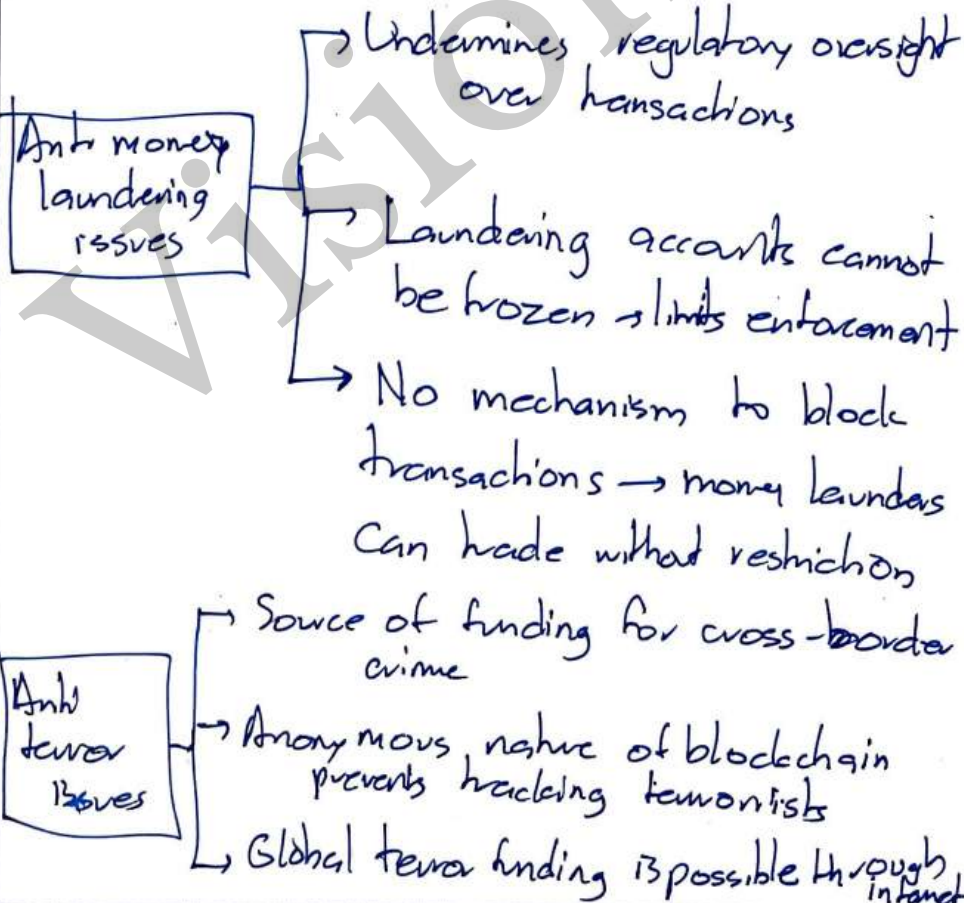
Functioning of crypto hawala

- ① The sender party starts a transaction on the blockchain
- ② The transaction on the blockchain is reviewed and verified by other nodes managing the blockchain.
- ③ The recipient is notified and accepts

The transaction

- ④ The valid transaction is entered on the blockchain and crypto currency transfer is complete.
- ⑤ This currency can be exchanged for real currency or used online

Challenges for financial crime management in India



Steps taken by India

- ① High tax on blockchain withdrawals and VDA's leads to disincentivization of cypho hawala ^(30%)
- ② Wealth tax on digital assets of 1% prevents accumulation of illegal wealth
- ③ Blockchain monitoring helps identify suspicious cypho wallets.
- ④ Global cooperation is used → India is participatory in UN convention on Cryptocurrency

Hence the cypho hawala menace requires sophisticated online monitoring and policy action.