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GENERAL STUDIES (TEST CODE : 1511)

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Medium Eng./Hindi	Eng	Registration Number	559772
Center	online	Date	13 Nov 2021

INDEX TABLE			INSTRUCTIONS
Q. No.	Maximum Marks	Marks Obtained	1. 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)। 2. There are TWENTY questions printed in ENGLISH & HINDI इसमें बीस प्रश्न हैं अंग्रेजी और हिन्दी में छपे हैं। 3. All questions are compulsory. सभी प्रश्न अनिवार्य हैं। 4. The number of marks carried by a question/part is indicated against it. प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं। 5. 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। 6. Word limit in questions, if specified, should be adhered to. प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए। 7. 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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Total Marks Obtained:			
Remarks:			

16-B, 2nd Floor, Above National Trust Building, Bada Bazar Marg, Old Rajinder Nagar, Delhi-110060

Plot No. 857, 1st Floor, Banda Bahadur Marg (Opp Punjab & Sindh Bank), Dr. Mukherjee Nagar
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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

प्रश्न संख्या
(Question No.)

इस भाग में कुछ
न लिखें
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in this part)

1. Despite a vast coast line and a number of waterways, why has India not been able to achieve its potential in bringing a significant modal shift from rail and road to waterways?

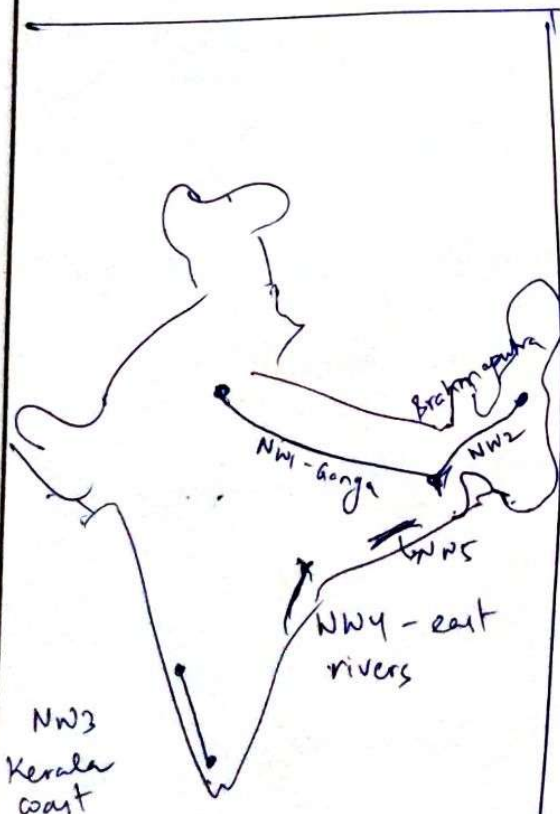
(150 words) 10

विस्तृत तट रेखा और अनेक जलमार्गों के बावजूद, भारत रेल और सड़क परिवहन प्रणाली से जलमार्गों की दिशा में महत्वपूर्ण प्रणालीगत परिवर्तन (मॉडल शिफ्ट) करने हेतु अपनी क्षमता को सार्थक करने में क्यों असमर्थ रहा है?

Indian logistics is heavily dependent on rail and road. Waterways accounts for less than 5% of total freight

Indian waterways potential -

- ① Extensive National waterways - as seen in map.



- ② Multi modal facility

(eg- developed at Varanasi)

- ③ Vast coastline of 7500 km

- ④ Ports - 12 major ports and numerous minor ports

Still a shift not observed due to

- ① Logistic issues - silting of rivers, low ecological flow resulting in big vessels unable to flow.
- ② Database management - real time bathymetric data (depth) not available
- ③ Need of vessels - to ply on waterways
Currently less than 1000 in India
riverine
- ④ Inadequate linkages - from ports to roads and rail
- ⑤ Saturation at ports - most working at 100% capacity already. eg - Cochin, Mumbai.

Waterways is a cheaper, environmentally friendly way of transport. Boosting it is needed to improve India's rank from 44th on World Bank Logistics Index.

82

2. The move to establish a National Bank for Financing Infrastructure and Development, to reverse the drag on India's growth potential will have its own set of challenges.
Discuss. (150 words) 10

भारत की संवृद्धि क्षमता संबंधी अवरोधों को व्युत्क्रमित करने के लिए एक राष्ट्रीय अवसंरचना वित्तपोषण और विकास बैंक की स्थापना के कदम की अपनी स्वाभाविक चुनौतियां होंगी। चर्चा कीजिए।

In Budget 2021, Government has proposed to establish National Bank for Financing Infrastructure and Development (NaBFID).

It will boost India's growth potential.

- ① Providing finance to stressed sectors - Public bank already reeling under high NPA's (13.5%).
- ② Regulatory relief - NaBFID exempt from CRC, CAG etc
- ③ 5 trillion economy rests on ^{national} Infrastructure pipeline - ₹ 111 lakh crore required.
- ④ Fast track project - ~~stuck~~ ^{stuck} due to lack of funding.

Challenges for NABFID →

- ① Shifting blame - accused of shifting NPAs of banks onto itself.
- ② Lack of transparency - out of regulatory oversight.
- ③ Source of financing not clear as ~~the~~ economy already recovering from covid 19

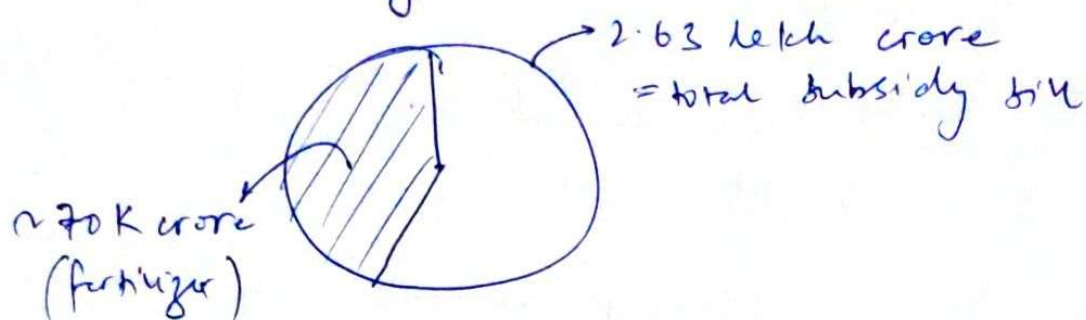
A booming infrastructure sector is needed
to achieve this goal.

3. Highlighting the issues related to the current fertilizer subsidy regime in India, discuss the need for reforms in this context.

(150 words) 10

भारत में वर्तमान उर्वरक सब्सिडी व्यवस्था से संबंधित मुद्दों को रेखांकित करते हुए, इस संदर्भ में सुधारों की आवश्यकता पर चर्चा कीजिए।

Budget 2021 saw heavy burden of
fertilizer subsidy



Issues related to fertilizer subsidy →

- ① Dependence on imports - Phosphorous (DAP) and potassium (MOP) need to be imported
- ② Black marketing and diversion of urea - as high as 40% subsidized urea diverted
- ③ Impact of global prices - recent increase in subsidy to cover increased prices during covid 19
- ④ Non-efficient disbursal - need of adopting Direct Benefit Transfer (DBT) for all fertilizers

Need of reforms in this context —

- ① Reduce current account deficit - as
Two major fertilizers (DAP and MOP)
are imported
- ② Non agronomic use - Easy availability
of nitrogenous fertilizer leads to excess
use (ideal ratio $NPK = 4:2:1$)
- ③ Climate change concerns - heavy GHG emissions
and energy intensive industry
- ④ Infrastructural gaps - need of energy
efficiency in fertilizer plant. (eg -
~~the~~ plants based on renewable energy)

Hence, fertilizer subsidy needs to be rationalized.
Swaminathan committee suggested decontrolling
prices of all fertilizers. Other initiatives are
like soil health card are in right
direction.

4. Identifying the need for a climate resilient agriculture in India, discuss how it can be achieved. (150 words) 10

भारत में जलवायु प्रत्यास्थ कृषि की आवश्यकता की पहचान करते हुए, चर्चा कीजिए कि इसे कैसे प्राप्त किया जा सकता है।

Q4

Climate resilient ~~in~~ agriculture involves adoption of practices that ensure food security and sustainability in era of climate change.

Need for climate resilient ~~in~~ agriculture

- ① Falling yield - FAO estimates 6% fall in yield of wheat since 1990s due to climate change.
- ② Food security - Global Hunger Index has placed India on 101st place.
- ③ Farmer income security - 44% of population depends on agriculture.
- ④ Sustainability of land - 17% of population needs to feed from 2-4% of world's land.
- ⑤ Pressure on resources - India is headed towards water crisis (78% freshwater used in agriculture).

Measures to achieve —

- ① Agronomic practices - eg - shifting to drought resistant (eg - millet) from water intensive crops (sugarcane, rice)
- ② Use of biotechnology - eg - Punjab government promoting PR-126 rice instead of Pusa rice to reduce water usage.
- ③ Rationalize fertilizer use - eg - using soil health card (Nitrogenous fertilizer release N₂O)
- ④ Regionally differentiated strategies - Gwamathen suggests climate smart agro villages
- ⑤ Innovation - eg - use of biodecomposition in Delhi-NCR instead of stubble burning

Climate resilient agriculture is crucial for achieving SDG 2 of no hunger and SDG 13 of climate change.

5. Mega Food Parks (MFPs) were considered to be a gamechanger for the food processing sector in India, but their progress remains stunted. Discuss. (150 words) 10

मेगा फूड पार्क (MFPs) को भारत में खाद्य प्रसंस्करण क्षेत्र के लिए एक महत्वपूर्ण चरण (गेमचेंजर) समझा गया था, लेकिन उनकी प्रगति अभी भी अवरुद्ध है। चर्चा कीजिए।

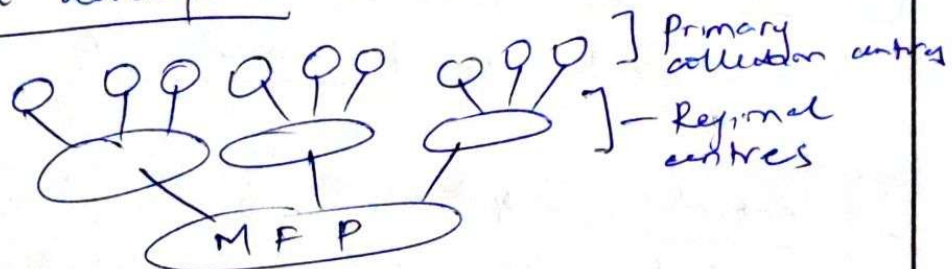
Q5

Under the umbrella scheme of Kisan Sampada Yojana, Government is setting up Mega Food Parks (MFPs) (e.g. - Zerom in Mizoram, Satra in MP)

MFP as gamechanger

- ① Leveraging economies of scale - by providing common infrastructure (e.g. - sorting, packaging, marketing etc)

- ② Regional development - Hub and spoke mode



- ③ Provide forward linkage - to domestic and international markets (e.g. - testing, certification, export hubs)

- ④ Pooling of resources - local knowledge and raw materials (e.g. - dairy in Gujarat)

- ⑤ Employment generators - Food Processing as multi industry with allied sectors - transport, storage etc.

However, their progress remains stunted -

- ① High initial capital investment needed -
to set up common infrastructure
- ② Inability to attract investment - from private
sector and FDI
- ③ Lack of skill and expertise - like managers,
marketing, branding staff etc
- ④ Structural issues - 86% of farmers are small
and marginal

Measures such as new law on Contract
farming, setting up of Farmer Producers
Organizations can accelerate their investment
and development.

6. Give an account of the challenges associated with rapidly increasing biomedical waste in India. Also, state the key features of the Bio-medical Waste Management (Amendment) Rules, 2018. (150 words) 10

भारत में तीव्रता से बढ़ रहे जैव-चिकित्सा अपशिष्ट से जुड़ी चुनौतियों का विवरण दीजिए। साथ ही, जैव-चिकित्सा अपशिष्ट प्रबंधन (संशोधन) नियम, 2018 की प्रमुख विशेषताओं का भी उल्लेख कीजिए।

Given rising pandemic of covid 19,
biomedical waste has come to forefront.

Challenges associated

- ① Hazardous nature - risk of spreading pathogens such as covid 19, diarrhea, hepatitis
- ② Disposing methodology - ~~incineration~~ incineration preferred but releases dioxin and uran
- ③ Unorganized collection - many facilities still not registered with biomedical waste management portal
- ④ Standard Operating Procedures - need to train human resource to handle such waste

Key features of Biomedical Waste Rules 2018

- ① Mandatory registration of all facilities generating such waste
- ② Database management by such facilities of waste going out
- ③ On site sterilization of hazardous waste
- ④ Disposal framework - handover waste only to registered handlers
- ⑤ Employee protection - regular vaccination and training.

Biomedical waste needs to be handled cautiously and strict implementation of 2018 rules is needed.

7. What do you understand by impact based forecasting in disaster management? How can such forecasting strengthen the disaster management preparedness? (150 words) 10

आपदा प्रबंधन में प्रभाव आधारित पूर्वानुमान से आप क्या समझते हैं? ऐसा पूर्वानुमान आपदा प्रबंधन की तैयारियों को कैसे मजबूत कर सकता है?

Impact based forecasting refers to forecasting of disasters not just based on objective severity but on basis of subjective local impact. (eg) impact of earthquake in highly populated area will be more severe

Impact based forecasting involves +

- ① Hydrometeorological data - such as prediction of cyclones
- ② local data - settlements, coastline configurations, structural strength of buildings
- ③ Local ecology - dryness of forest, availability of catchment etc
- ④ Vulnerability of population - awareness and capacity, cattle population, remoteness etc.

It can strengthen disaster preparedness as

- ① efficient use of resources - e.g. diverting more food towards higher population area
- ② Capacity building - e.g. Delhi project to underground power lines due to cyclone impact
- ③ Mitigation (e.g. monitoring in bamboo forest - more prone to fires)
- ④ Quick response - prioritize higher impact area first

Recently, IMD has adopted impact based forecasting for cyclones. It should be expanded to cover all disasters.

8. Low Earth Orbit is becoming increasingly crowded as countries race to launch satellites into space. Highlighting the associated issues, discuss international efforts taken in this regard. (150 words) 10

देशों द्वारा अंतरिक्ष में उपग्रहों को प्रक्षेपित करने की बढ़ती होड़ से निम्न भू-कक्षा में इनका संकेद्रण बढ़ता ही जा रहा है। इससे संबंधित मुद्दों को रेखांकित करते हुए, इस संबंध में किए गए अंतर्राष्ट्रीय प्रयासों पर चर्चा कीजिए।

Low earth orbit (LEO) is the height of 100-200 km from earth where majority of satellites have been deployed.

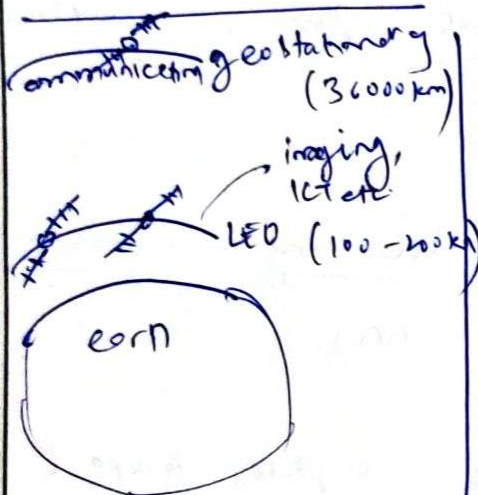


Figure: orbits

Issues associated with crowding LEO -

① Space debris - 70% of it is in LEO

② Kessler syndrome -

domino collision effect due to overcrowding

③ Hinder astronomy - as satellites reflect light causing noise in telescopes

④ Space junk - retired satellites still in orbit.

⑤ Strategic weaponization of space - e.g. - USA has set up a 'space command' since satellites are critical infrastructure.

U.P.S.C.

International efforts in this regard -

① Limit space junk - eg - UK has launched satellite that will automatically deorbit at end of life

② Space Debris - Remove Debris project of European Union and Nasa

③ Space awareness - Inter Agency Space Debris Coordination Committee for global dialogue

④ Promote innovation - eg - SpaceX dark Sat that will not interfere with astronomy

Space is global common, countries need to come together to regulate LED lines of outer space Treaty

9. Enumerating the existing measures to counter bio-terrorism in India, highlight the need for a bio-terrorism law.

(150 words) 10

भारत में जैव-आतंकवाद का मुकाबला करने के लिए मौजूदा उपायों को सूचीबद्ध करते हुए, एक जैव-आतंकवाद कानून की आवश्यकता को रेखांकित कीजिए।

Bio-terrorism is predicted to be the next big challenge - use of pathogens to achieve political gains by terrorist groups (e.g. - anthrax) ~~that~~.

Existing measures in India to counter

- ① NIA Act - cover any terrorist activities
- ② Biodiversity Act 2002 - prevents illegal use of biotechnology.
- ③ National Medical Commission - regulates all medical and pathology labs
- ④ Cartagene Protocol of CBD - prevent illegal import of living modified organisms
- ⑤ Customs Act can punish illegal import of organisms.

Need of bioterrorism law

- ① Scale of impact - infection can rapidly spread and impact entire population (eg - as seen during coronavirus)
- ② Invisible nature of threat - requires strict monitoring of pathology labs
- ③ High fiscal burden in recovering from bio-terrorism attack (eg - coronavirus)
- ④ Need of ~~extra~~ cooperation across agencies - customs, biotechnology, health etc

Hence, a comprehensive bio-terrorism law is needed in India.

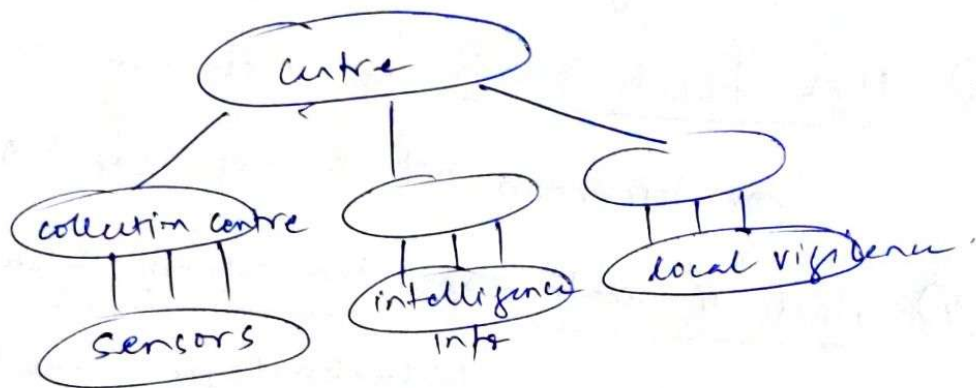
Q10

10. Discuss the potential of "Integrated Law Enforcement Centres" and "Smart Walls" on India's border areas to address the prevailing security challenges. (150 words) 10

मौजूदा सुरक्षा चुनौतियों से निपटने के लिए भारत के सीमावर्ती क्षेत्रों में "एकीकृत कानून प्रवर्तन केंद्रों" और "स्मार्ट वॉल" की क्षमता पर चर्चा कीजिए।

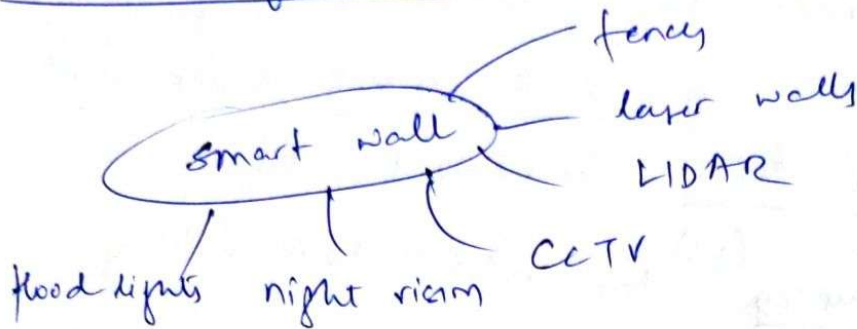
The Madhukar Gupta committee has recommen-
-ded 'smart walls' for border defence and
& 'Integrated law enforcement'

Potential of Integrated law enforcement centres



- ① Centralized decision making - makes quick and efficient use of resources
- ② Reduce ~~man~~ human error - eg - Machine learning based analysis of camera feed.
- ③ Integration with other agencies - such as NATGRID database, headquarters etc,
- ④ Faster response - due to efficient use of ICT technologies.

Potential of smart wall



- ① Protect border in difficult terrain - eg -
Bangladesh border has numerous streams
- ② Reduce Resilience - eg - Cyclone Amphan
damaged fence ; but laser walls
unaffected.
- ③ Reduce man power requirement - especially
in difficult areas like Siachen
- ④ Emerging threats - eg - Drones across
Pakistan border - need LIDAR.

hence, going forward, prevailing security
challenges require the use of new methods.

11. Farm loan waivers are neither adequate nor recommended for promoting sustained agricultural growth. Analyse.

(250 words) 15

सतत कृषि विकास को बढ़ावा देने के लिए कृषि ऋण माफी न तो पर्याप्त है और न ही अनुशंसित। विश्लेषण कीजिए।

यहाँ में कुछ
न लिखें
do not write anything
in this part

Recently India has seen a slew of farm loan waivers e.g. 2008 Central Government, 2021 Tamil Nadu Government etc. Economic Survey (ES) has noted their futility

They are not adequate for promoting sustained agro-growth -

- ① Affect only a proportion of farmers - who borrow from formal sources
- ~~② Maintaining fiscal~~
- ② Increasing need of credit in agriculture - NCRB records 10% of suicides are by indebted farmers.
- ③ Structural issues causing low growth - ~~impact~~ cereal centrality, chain of intermediaries etc
- ④ Bottlenecks in price recovery - Indian farmer gets only 25% of retail price (USA - as high as 70%)

U.P.S.C.

They are not recommended as —

- ① Destroy credit culture - ES notes wilful defaults by farmers in hope of waiver
- ② Wrong beneficiaries - Records suggest mostly big farmers benefit from waivers.
- ③ Structural issues remain - According to NSSO, 40% of agriculture credit comes from non-formal sources.
- ④ Voting bank politics - fuelled by political parties in election season.
- ⑤ Mounting fiscal deficit - reached above 9% ~~is~~ in 2020-21

Way forward —

- ① Improve access to credit - e.g. - recent increase in priority sector lending (PSL) quota of farmers
- ② Prevent populist policies - give Statutory backing to model code of conduct

- ③ Address structural issues - Land consolidation
(formation of farmer producer organisations).
- ④ Improve income of farmer - eg - e-NAM,
Fasal Bima Yojana etc.
- ⑤ better targeting of farmers - eg use of
SECC database.

As ES suggests, farm loan waivers
do more damage than good. Agriculture
growth in India requires holistic structural
reforms.

12. A number of initiatives in recent years have focussed on the MSME sector. Why is there a need to focus on this sector? Also, identify the measures taken by the government and further scope of action. (250 words) 15

हाल के वर्षों में अनेक पहलों ने MSME क्षेत्र पर ध्यान केंद्रित किया है। इस क्षेत्र पर ध्यान केंद्रित करने की आवश्यकता क्यों है? साथ ही, सरकार द्वारा उठाए गए कदमों और आगे की कार्यवाही के दायरे की पहचान कीजिए।

MSME or micro, small and medium enterprises are an important pillar of Indian economy.

Need to focus on MSME

- ① Contribution to GDP - almost 33%.
GDP contributed by MSME sector
- ② Exports - 45% of exports from this sector (e.g. - Tamil Nadu textiles, bicycles from Ludhiana etc)
- ③ Employment generator - given that 60% of India's population is below 35 years
- ④ Improve per capita income - directly related to growth in MSME and employment.

Measures taken by government -

- ① Credit support - eg - MUDRA loans,
Emergency time credit scheme during covid19
~~19~~
- ② Bargaining power - eg IBC code covers
operational creditors (mostly MSMEs),
Samadhan portal etc
and Institutional support
- ③ Skill development - eg - National Rural
Livelihood Mission, Rozgar Protection
Yojana, Skill India
- ④ Forward linkage - eg - SARAS Aajeevika
melas, Government e-Marketplace.
- ⑤ Use of technology - eg - allowing MSME
on TREDS platform
- ⑥ Marketing - eg - Quality Council of India's
Zero Effect, Zero Defect certification.

Further scope of action

- ① Extending support during covid 19 - MSME sector heavily impacted ^{due to} supply chain disruptions.
- ② focus on uparning sectors - such as MSME in agro-industry, export oriented etc.
- ③ Reduce regulatory cholesterol - Economic survey notes phenomena of dwarf firms in India.
- ④ Sunset criteria in support - prevent support non profit making firms.

MSME is ~~is~~ the growth engine of economy.
Extending the right support is needed.

13. Skilling the Indian population faces a 3E challenge - Education, Employment and Employability. Discuss. Also suggest interventions required to effectively manage this challenge.
(250 words) 15

Skilling is current need for India due to demographic dividend - 60% of population below 35 years

Challenges	Intervention
I Education 1.1 low enrolment in higher education institution ↳ 26%. 1.2 Quality - <u>India Skill report</u> suggest 46% graduates <u>unemployable</u> 1.3 Nature of education - not promotes rote learning	National Education Policy 2020 envisages 50% enrolment Align industry and education (eg - <u>NAMCOM Future Skills</u>) <u>Atal Innovation Mission</u>, introduction of <u>vocational education</u> at school level

1.4 Informal skilling - ~~Prior~~ Prior Recognition
of Prior learning
Certificates under PM-KVY

II Employment

2.1 Skill - job mismatch - set up ITIs (Industrial
Training Institutes)

2.2 Need of 4th
Industrial revolution
skills - computer,
automation, AI etc - Promote computational
thinking at school under
NEP 2020

2.3 Lack of investment
from private sector
in skilling.
(eg- Blackrock CEO
statement on cutting
skilling for profit) - collaborate with private
sector in skilling.
eg- use of CSR funds

~~Q.1~~

Employability

① Lack of jobs for
higher educated
as noted in PLFS
2017

— create jobs - Startup
India, attracting FDI
etc

② Align skills to
industry

— Industry - academic partnership

Despite its importance, agricultural marketing faces various institutional and infrastructural related issues in India. Elaborate. Also, enlist the measures that have been taken in this context. (250 words) 15

अपने महत्व के बावजूद, कृषि विपणन को भारत में विभिन्न संस्थागत और अवसंरचना संबंधी मुद्दों का सामना करना पड़ता है। सविस्तार वर्णन कीजिए। साथ ही, इस संदर्भ में किए गए उपायों को भी सूचीबद्ध कीजिए।

Agriculture marketing covers the chain of activities involved in getting an agriculture product from ~~the~~ farm to fork - packaging, branding, advertising etc

Institutional issues in agro-marketing -

- ① Chain of intermediaries - In India farmer gets only 25% of retail price
- ② Poor bargaining power of farmer - average land holding in India only 1.08 hectares
- ③ Lack of cooperatives - as seen in western nations like Netherlands, Belgium
- ④ Lack of knowledge - to pursue marketing for urban ~~markets~~
- ⑤ Legal drawbacks - until now, monopoly of mandi traders - cartelization and uncompetitive nature

Infrastructural issues in agro-marketing

- ① Price discovery is not apt mark - many states still not joined eNAM
- ② Lack of infrastructure - eg- cold storage, food processing to prevent dietary loss
- ③ Lack of skilled professionals - testing lab, designing and branding etc. (eg- AMUL's success is largely due to this)
- ④ Lack of forward linkage - eg- metalled roads, temperature controlled trucks..
- ⑤ Lack of export based marketing - eg - of traditional Indian products like biryani, pickles etc

Measures taken to improve this

- ① Use of technology - eg - eNAM, mKisan portal to send right price signals to farmer.

- ② Promoting local products - Budget 2020
introduced one district one product
scheme (eg- Muzaffarpur Litchi)
- ③ Transport - Kisan rail, Krishi udan.
- ④ Value addition - Kisan Sampada yojana
for food processing
- ⑤ Branding and advertisement - eg - Punjab
government's drive to export Punjab
Kinnow

15. Marine litter is not just an environmental issue but poses a socio-economic challenge as well. Discuss. Also, enumerate the initiatives taken by the global community to reduce marine litter. (250 words) 15

Q15

Marine litter is defined as waste that is disposed off into oceans. According to estimates more than 50% of waste ends up as marine litter.

Environmental issue —

- ① Damages ecology - eg - kill mangroves from oil spills
- ② Harms flora and fauna - eg - 2019 Scotland coast sperm whale dead body with 200 kg plastic ingested.
- ③ Biodiversity at risk - eg - dead zone in Atlantic ocean
- ④ Global pollution - eg - microplastic found in polar waters

However, it is a socio-economic challenge as well -

- ① Fishing - e.g. biomagnification of heavy metals and mercury in fishes
- ② Blue economy breakdown - e.g. Sri Lankan fishermen suffering under ban from European Union due to failing test standards.
- ③ Waste disposal capacity building needed especially in developing countries to avoid dumping waste
- ④ Global shipping industry - infamous for sulphuric acid releases from scrubbers installed.
- ⑤ Coastal community heavily impacted who depend directly on ocean resources.

In this context, global community has taken the following initiatives -

- ① Global dialogue - eg - MARPOL under
talk for redefining standards for
scrubbers on ships
- ② Phase out single use plastic - Issue raised
by India at COP of UNFCCC
- ③ Global awareness - eg - against sunscreens
using microbeads.



Oceans are common grounds.

Life below water requires
for marine litter removal.

Achieving SDG-14

global cooperation

Q16

16. Assess India's vulnerability to flash floods and suggest measures for better resilience to flash floods. In this context, also briefly highlight the significance of recently launched Flash Flood Guidance System (FFGS) operated by the Indian Meteorological Department (IMD). (250 words) 15

Flash floods occur when sudden excess water comes in the form of heavy rain, cloud burst, dam release, overflowing rivers etc.

India's vulnerability to flash floods

① North plains
(MP, Rajasthan)
Monsoon burst

② Bihar - Kosi
excess melt
water and sediment

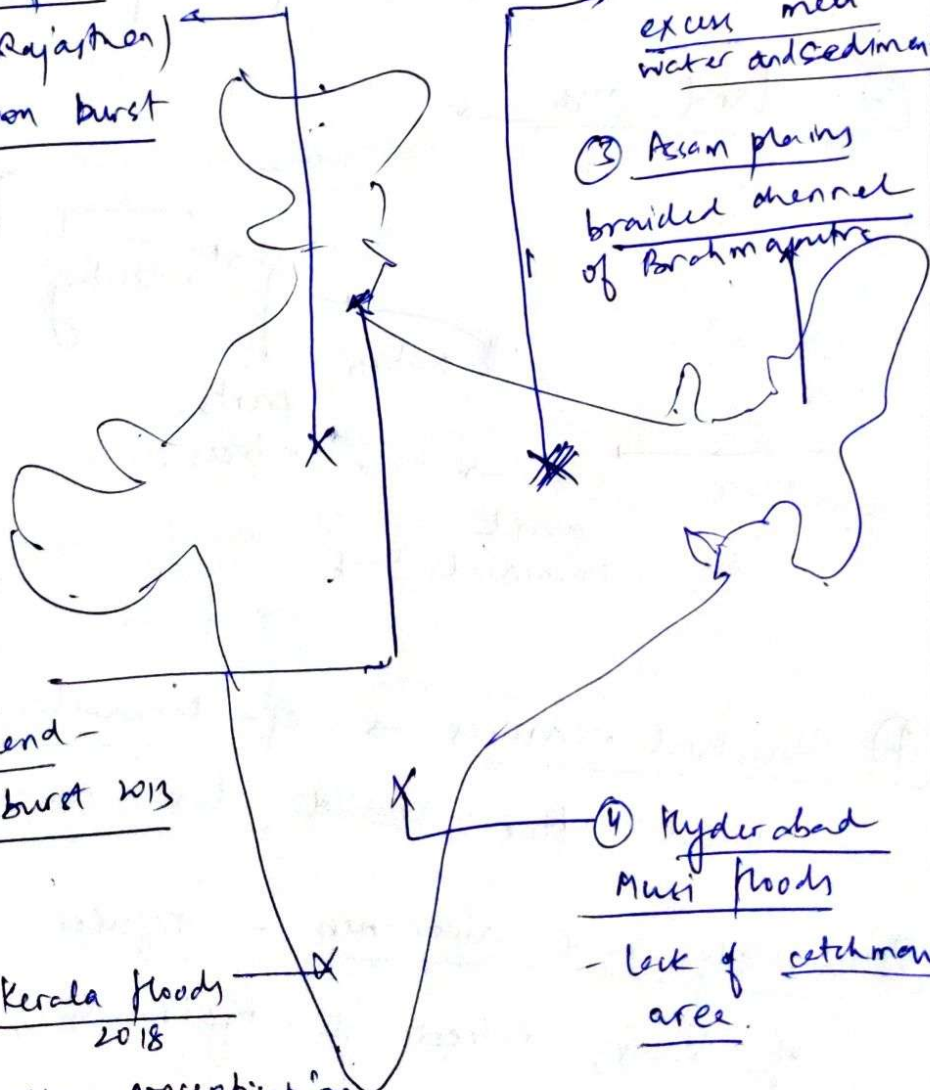
③ Assam plains
braided channel
of Brahmaputra

④ Uttarakhand -
cloud burst 2013

④ Hyderabad
Musi floods

- lack of catchment
area.

⑤ Kerala floods
2018
excessive concretization
(Madhukar Gudgil Report)

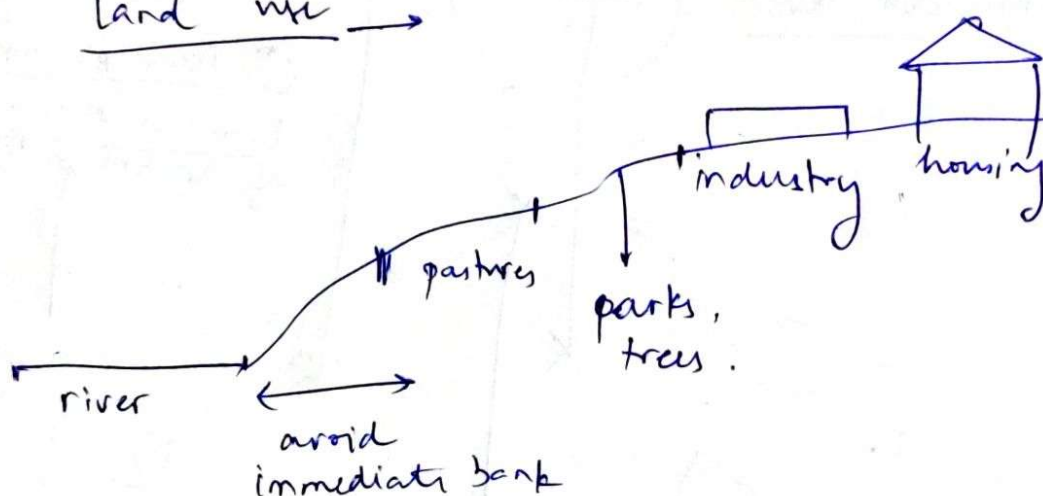


Measures for better resilience

① Capacity building - eg - Copenhagen Model
of extra capacity in storm water drainage,
rain ponds etc

② Model town planning - eg - Yongning Park
in China designed with wetland to
accommodate periodic flooding

③ Land use →



④ Structural measures → eg - Damodar river
tamed after ~~land~~ dam construction

⑤ Knowledge and awareness - regular cleaning
of drains, retreat to highlands,
Contour bunding etc

Significance of flash flood guidance system -

- ① Act as Early Warning system - to mitigate impact as much as possible
- ② Mitigation measures - eg - building drain channels in areas more prone
- ③ Rescue and response plans can be designed accordingly - eg - training NDRF teams.
- ④ Information dissemination - quicker across all stakeholders

(exam rain)

Recent cases of Uttarakhand floods, Tamil Nadu floods (Norm east from soon) are reminder to focus on flash floods.
There is need to achieve SDG 9 - Resilient infrastructure.

Q1A

17. Hydrogen based energy production can play a key role in a clean, secure and affordable energy future. In this context, identify the potential and opportunities for utilising hydrogen based technologies. What are the challenges that need to be addressed to fulfill the potential? (250 words) 15

Recently Niti Aayog released a policy document on hydrogen based economy.

In context of this, key potential and opportunity areas for using hydrogen are -

- ① Transport - hydrogen vehicles have 3 times efficiency and equal refillable time to conventional vehicles.
- ② Industry - eg - in energy intensive sectors like fertiliser production
- ③ Energy storage - ~~is~~ complementary to solar/wind farms during peak energy generation
- ④ Fuel cells - for various uses such as remote IoT sensor network

- ⑤ Lower fossil fuel demand - Currently India imports 85% of fossil fuel
- ⑥ Clean energy - by products is water vapour
- Challenges not need to be addressed
- ① High initial capital cost - process such as electrolysis based plants needed
- ② Safety - The calorific value of hydrogen is extremely high
- ③ Transport - Needs ultra-chilled tankers and storage tanks
- ④ Demand creation - currently ~~demo~~ market demand of hydrogen vehicles quite low
- ⑤ Investment - Private sector has no investment in this area.

Way forward

- ① Innovative use - e.g. HiNG buses pilot project in Delhi

- ① Collaborate with private sector - e.g. -
India H2 alliance set up recently
- ② International collaboration - with countries
like South Korea who have massive
H₂-vehicle programs.

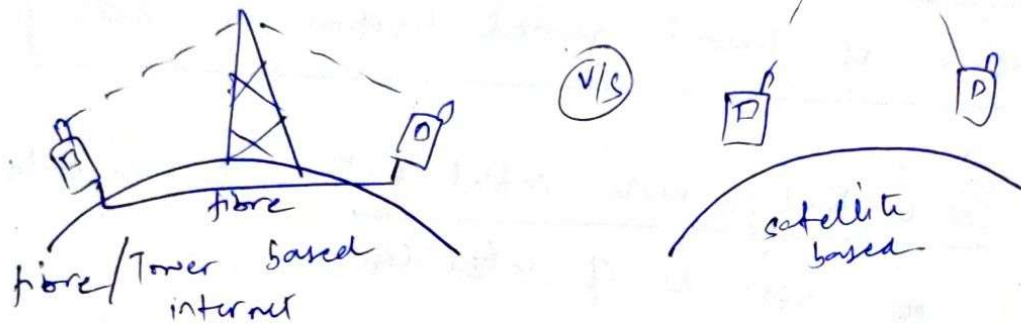
Hydrogen is being visualized as next
big thing in energy sector. India must
grab all opportunities to leverage its use.

Q18

18. Despite the huge promise of satellite-based internet connectivity, it hasn't gained traction on a significant commercial scale, especially in India. Discuss. (250 words) 15

उपग्रह आधारित इंटरनेट कनेक्टिविटी में निहित विशाल संभावना के बावजूद, इसने विशेष रूप से भारत में, वाणिज्यिक पैमाने पर महत्वपूर्ण पकड़ स्थापित नहीं किया है। चर्चा कीजिए।

Satellite based internet is use of internet through network of satellites ~~base~~ in low-earth orbit. eg - SpaceX StarLink project.



Satellite based internet shows huge promise

- ① Easy to reach remote terrain where setting up towers is difficult (eg - mountains, glaciers etc)
- ② Comparable characteristics to terrestrial - in terms of latency and throughput
- ③ Increased security - Connectivity of border forces with mainland

④ Bridge digital divide - Internet penetration above 60% in Delhi, but less than 30% in rural areas (^{IEPMA} ~~IEPMA~~ report)

⑤ Expanding space technology capability - ISRO set up ANTRIX, INSpace etc.

However, it hasn't gained traction in India

① Prohibitively high initial cost - to launch a network of satellites

② Lack of private investment in satellite building and launching

③ Logistic issues - crowding of low earth orbit, space junk.

④ Need of Bandwidth - in Giga-Hertz range - limited availability

⑤ Strained telecom sector - under debt of 4 lakh crore

Way forward

Despite challenges, satellite based internet offers significant advantages for remote areas connectivity. Alternative paths such as balloon-based internet (Project Loon of Google) can be explored.

19. India's attempts at strengthening its intelligence infrastructure and capabilities have historically been reactive and incremental, rather than holistic and sustainable. Discuss. Also, provide a concrete framework in transforming the country's intelligence capabilities. (250 words) 15

Intelligence infrastructure is of strategic importance to prevent any attacks from occurring by adequate surveillance and monitoring.

Reactive and incremental nature of Indian intelligence —

- ① Distributed nature — agencies like IB, RAW, NSA were set up incrementally as per need.
- ② Reactive approach — setting up of NATGRID and MAC (Multi agency centre) post 26/11 Mumbai attacks.
- ③ Lack of pro activeness — IT Act is not upto date to counter cyber threats.
- ④ Lack of nation wide approach — eg — integrated efforts like Cyber dome of Kerala.

U.P.S.C.

However, this is not entirely the case
and several holistic measures have
also been undertaken —

- ① Setting up of Chief of defence staff office —
to coordinate between all wings of
armed forces
- ② e-governance measures — Project NETRA
to monitor social media, NATGRID etc
- ③ Expertise centres — CI4C (Indian centre
for cybercrime coordination centre)
- ④ Coordinating authority — PMO oversees
all intelligence operations along with
NSA

Concrete framework for transforming intelligence —

- ① Collaborative and non-overlapping work
between MHA, IB, RAW etc.

- ② Local level intelligence - to be integrated
(eg - recent arrest of LeT operators from
Lucknow)
- ③ International communication channels -
with Interpol, PATF etc
- ④ Public as partner for reporting suspicious
activity. (eg - fishermen coordinating with
Coast Guards)

Ind ARC recommended a comprehensive
National Security Act that will give
legal foundation to intelligence operation.

20. In light of the prominent instances of drone attacks by both state and non state actors, assess the challenges and capabilities of India in dealing with such security threats.

(250 words) 15

राज्य और गैर-राज्य दोनों अभिकर्ताओं द्वारा ड्रोन हमलों के प्रमुख दृष्टांतों के परिप्रेक्ष्य में, ऐसे सुरक्षा खतरों से निपटने में भारत की चुनौतियों और क्षमताओं का आकलन कीजिए।

Recently drone attacks have raised major security concerns -

① State actors - attack by Iranian drone on Saudi's Aramco facility.

② Non-state actor - many drone across India-Pakistan border

Challenges presented by drone attacks

① Overcoming traditional security such as fences, guard posts by flying over them

② Wide uses - from delivering arms to reconnaissance

③ Easy availability ~~of~~ of drones in low prices

④ Critical infrastructure - such as nuclear plants, petroleum reserves can be attacked.

- ③ Difficult detection - e.g. - of nano drones
don't show up on radar

Capabilities of India

- ① Surveillance - use of laser walls,
radars etc to monitor
- ② Regulation - Digi Sky App to monitor
domestic flying of drones.
- ③ Military abilities - testing ~~to~~ anti-drone
technology on DRDO's ABHYAS
- ④ State of the art weapons - e.g. - Barak 8
from Israel - (surface to air)
- ⑤ Zonation - dividing airspace on
basis of security threat - green,
red and yellow.

Way forward

- ① Expand capabilities - deploy jammers,
drone nets etc especially in border
areas.

② Regulation of drones in sensitive areas
like airfields, military posts etc.

~~③~~

Indian security must evolve with
emerging threats. Countering rogue drones
is an important area of focus