



# VISION IAS

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## GENERAL STUDIES (TEST CODE : 1524)

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Medium Eng./Hindi	ENGLISH	Registration Number	933854
Center	ONLINE	Date	20-12-2020

INDEX TABLE			INSTRUCTIONS
Q. No.	Maximum Marks	Marks Obtained	
1	10		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	10		2. There are <b>TWENTY</b> questions printed in <b>ENGLISH &amp; HINDI</b> इसमें बीस प्रश्न हैं अंग्रेजी और हिन्दी में छपे हैं।
3	10		3. <b>All questions are compulsory.</b> सभी प्रश्न अनिवार्य हैं।
4	10		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	10		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	10		
7	10		
8	10		
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16	15		
17	15		
18	15		
19	15		
20	15		
<b>Total Marks Obtained:</b>			
<b>Remarks:</b>			

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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.

1. Tenancy reforms are much needed to give a boost to the Indian agricultural sector. Comment. In this context, also discuss the significance of the Model Land Leasing Act, 2016. (150 words) 10

भारतीय कृषि क्षेत्र को बढ़ावा देने के लिए काश्तकारी सुधारों की अत्यंत आवश्यकता है। टिप्पणी कीजिए। इस संदर्भ में, मॉडल भूमि पट्टा अधिनियम, 2016 के महत्व की भी विवेचना कीजिए।

Ans) Land reforms were taken up just after the independence which had the component of tenancy reforms to ensure that tenants are not harassed, land to the tiller etc.

Significance of tenancy reforms:

Significance:

→ About 70% peasants are tenants or landless labourers

→ Large landowners harass tenants by demanding upto 50% rents.

→ These tenants own an average of 1.2 hectare land & unsustainable for income

→ Lack of technology, infrastructure due to low revenue of these tenants

Model Land Leasing Act, 2016:

- ① This Act allows for reduced & fixed rents to the landowners by the states → Save the revenue of farming.
- ② The landowners can't evict the tenant at his own wish.  
↳ Land to the tiller
- ③ Even if landowner decides to sell the land, he needs to prove his farming in some percentage of land  
↳ Landowner compelled to not sell the land.
- ④ Option to approach the court in case of eviction.
- ⑤ With time, land transferred to tiller.

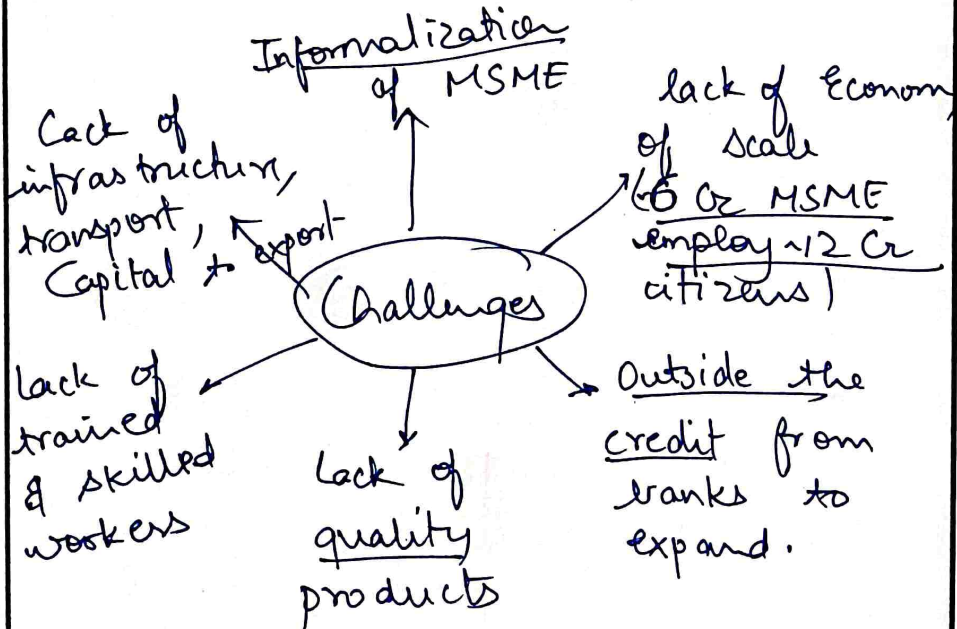
Model land leasing Act, 2016 would play crucial role in decreasing inequality among farmers (large (0.1% own 15% land) & small-marginal (84% own 45% land)) & double the farmers' income by 2022

2. Identify the various challenges that have restricted the entry of Indian MSMEs into the foreign market. Also mention some government initiatives that have been taken to facilitate MSME exports. (150 words) 10

विदेशी बाजारों में भारतीय MSMEs के प्रवेश को बाधित करने वाली विभिन्न चुनौतियों की पहचान कीजिए। साथ ही, MSME के निर्यात को सुगम बनाने के लिए सरकार द्वारा की गई कुछ पहलों का भी उल्लेख कीजिए।

Ans) MSME contribute 29% to Indian GDP and 45% to exports. They form the largest component in exports from India but various challenges have restricted their growth.

### Challenges to exports for MSME:



## Government Initiatives to facilitate exports

① Shift from RODTEP (Remission of duties in Trade & export products) to MEIS (Merchandise export Incentive Scheme)

② Tax breaks & lowered corporate taxes from 34% to 25%.

③ Credit upto 1cr within 59 minutes

④ Development of trade infrastructure, port facilities, transport, cold storage

⑤ Digital initiatives for easy custom clearance, letter of credit from banks  
TRCS platform

⑥ SEZ, NIMZ, GIFT cities

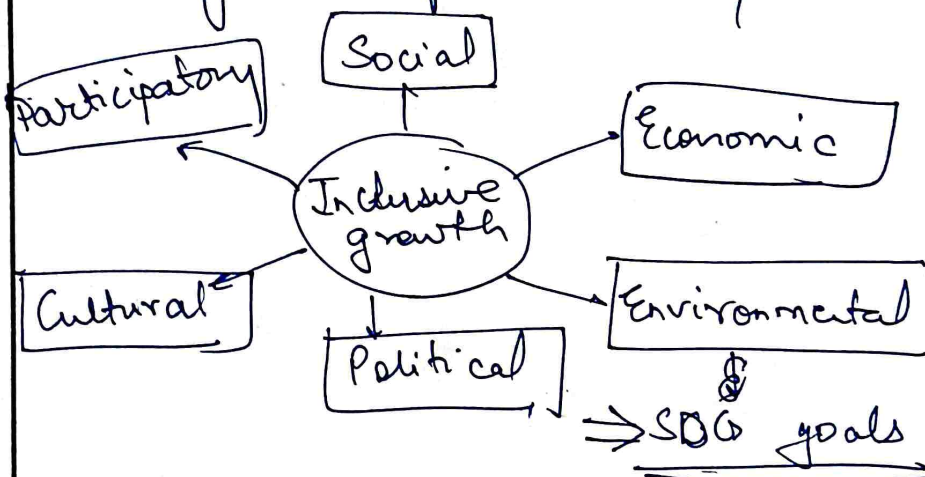
⑦ Interest subvention during COVID-19  
with revision of criteria of MSME

Several steps were taken to strengthen the trade & exports of MSME as they hold the potential to decrease unemployment (from 6%), rapidly improve consumption & investments & foster growth towards Atmanirbhar Bharat

3. India's march towards inclusive growth and its achieving the Sustainable Development Goals are intricately linked. Discuss. (150 words) 10

समावेशी विकास की दिशा में भारत की प्रगति और संधारणीय विकास लक्ष्यों की प्राप्ति जटिल रूप से जुड़े हुए हैं। चर्चा कीजिए।

Ans) Inclusive Growth refers to economic social development of all the sections of the society along with equal participation of all sections in growth of the country.



Inclusive Growth → SDG goals:

- ① Poverty alleviation through economic inclusivity, employment welfare schemes → SDG 1 (poverty) compliance with

- ② Social development,  
nutritional security, → SDG 2  
through PDS, NFSA  
Midday meal (nutritional  
security &  
food security)
- ③ Gender parity,  
participation of → SDG 5 (Gender  
women in equality)
- ④ Clean & clear  
environment  
with sustainable  
cities for all → SDG 6, 7  
with affordable  
housing, transport (Clean environment  
& energy)
- ⑤ Education,  
hospital & → SDG 3 (well being)  
basic healthcare 4 (Education)

Hence, inclusive growth would auto-  
matically result in attainment of  
SDG goals resulting in compliance  
to both domestic & international  
order ensuring Better life to all

4. Highlight the need for evolving an appropriate system of Rules Of Origin in regional trading arrangements. What steps have been taken by India recently in this regard? (150 words) 10

क्षेत्रीय व्यापार व्यवस्थाओं में उत्पत्ति के नियमों की एक उपयुक्त प्रणाली विकसित करने की आवश्यकता पर प्रकाश डालिए। हाल ही में, भारत द्वारा इस संबंध में क्या कदम उठाए गए हैं?

Ans) Rules of Origin refers to assigning the product or service, its Country of origin where it was manufactured, assembled or attained its maximum value enhancement.

Need for evolving Rules of Origin:

- ① Indian trade in the world contribution is miniscule
  - Trade - 1.7% of total
  - Services - 3.4% of total
- ② High imports, Aera trade deficit
- ③ Countries like China benefit by routing through an FTA country.  
↳ Chinese smartphone coming through ASEAN
- ④ Identifying the benefits in terms of tariffs to given to the product

↳ (Ex) Most favoured nation status or FTA

- (5) For statistics to understand the flow from each country → Analyses
- (6) Protect from dumping

Steps taken by India:

- (1) Rules of origin compulsory for e-commerce companies' website
- (2) Rules of origin mandatory on any product reaching the port of India
- (3) Provision of rules of origin in FTA, PTA, MFN agreements.
- (4) Noted for rules of origin in RCEP agreements which was not ratified
- (5) Laws & rules formulated to identify the percentage of contribution from rules of origin country. (Ex) 50% contribution of China

India though needs to protect its indigenous industry from dumping & competition from cheap imports, efforts should be on strengthening local industry

5. MSP regime is a creation of an era of scarcity in the 1960s. Discuss its relevance in the current era of surplus agricultural production.

(150 words) 10

MSP व्यवस्था 1960 के दशक के अभावग्रस्तता के युग का एक आविष्कार है। अधिशेष कृषि उत्पादन के वर्तमान समय में इसकी प्रासंगिकता की विवेचना कीजिए।

Ans) Minimum Support Price (MSP) provides for fixed price by government agency to the farmers for 22 notified crops upon procurement.

Development of MSP:

- ① Started in 1960 during immense deficiency of food grains to feed all
- ② Procurement of foodgrains started by the Government from farmers for distribution to needy.
- ③ Storage by the government to ensure avoidance of black marketing, hoarding etc.
- ④ Security to farmers guaranteed with motivation to increase productivity & yield along with development in agriculture

Relevance of MSP in modern times:

- ① Surplus of foodgrains produced
  - Demand of rice - 300 MT, production - 350 MT
  - 15% wastage in post harvesting
  - India highest exporter of Basmati
- ② However, MSP ensure stocking of foodgrains by government agency for PDS which is necessary for welfare of 66% population.
- ③ MSP ensure good prices to farmers
- ④ MSP acts as floor price to markets in other regions, providing high incomes to farmers
- ⑤ MSP has potential to bring in 2<sup>nd</sup> green revolution

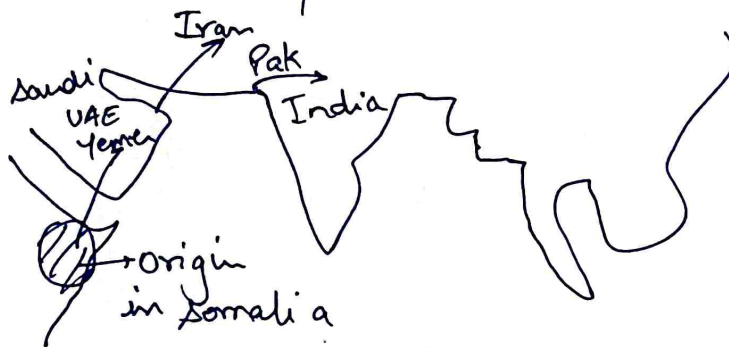
MSP need to be continued but with equitable distribution in all regions, to all crops (apart from paddy, wheat) ensure market prices to be commensurate with MSP and maximum welfare

6. Examine the link between the recent locust attack and climate change.

(150 words) 10

हाल ही में हुए टिड्डियों के हमले और जलवायु परिवर्तन के मध्य संबंध का परीक्षण कीजिए।

Ans) Recently, Western India (Rajasthan, Gujarat, MP, Punjab) experienced large scale locust attack which led to loss of crops of farmers.



Link between Climate Change & locust attacks:

① Climate Change has resulted in warming of western Indian Ocean near Somalia

↓  
Increased rain in Horn of Africa

↓  
Moisture content in soil lead to breeding of locusts.

- ② Change in wind direction due to  
Climate change  
↓  
Movement of locusts towards north
- ③ Climate Change induced vegetation  
in arid areas of Saudi Arabia, UAE,  
Iran, Pakistan acted as food for  
locusts.
- ④ Delayed monsoon withdrawal resulted  
in NE winds causing movement into  
Rajasthan desert
- ⑤ Western disturbances (increased intensity)  
made the soil of desert moist,  
perfect for breeding.
- ⑥ Increased temperature helps in  
magnification of the desert locusts

Locusts & other pest attacks have increased in intensity & frequency (from once in 10 years to 4-5 years now) due to Climate Change. Resolutions at UNFCCC, Paris deal, afforestation, GHG emission control needs to be observed

7. Highlighting the properties of Carbon Nanotubes, discuss its applications.  
(150 words) 10

कार्बन नैनोट्यूब्स के गुणधर्मों पर प्रकाश डालते हुए, इसके अनुप्रयोगों की विवेचना कीजिए।

Ans) Nanoparticles are materials of nanometre size (1-100 nm) which show significantly different physical, chemical, environmental, biological properties than larger materials.

Nanotubes                  Nanobots                  Nona membranes                  Nano pills

Properties of Nanotubes :

- ① Higher electrical conductivity
- ② Better absorption of materials
- ③ Ability to filter items.
- ④ Higher thermal conductivity
- ⑤ Non-reactive nature
- ⑥ Relatively easy to manufacture from Graphite, fullerene (C-60)

### Application of Carbon nanotubes:

- ① In drug delivery to the desired location in body will ensure better absorption.
- ② Application of fertilizers & pesticides at roots would reduce runoff & costs of application.
- ③ Can be used in RO device with cheaper & effective membrane filtration.
- ④ Superconductivity would reduce the cost of metal usage.
- ⑤ Application in scientific research, quantum application.

Carbon nanotubes has immense potential to improve standard of living, Government should enforce Nano Mission, fund institutes & train scientists.

8. India's domestic patent regime privileges public health over pharmaceutical industry's interests. Comment. (150 words) 10  
भारत की घरेलू पेटेंट व्यवस्था औषध उद्योग के हितों पर सार्वजनिक स्वास्थ्य को विशेषाधिकार प्रदान करती है। टिप्पणी कीजिए।

Ans) Patent refers to the intellectual property right guaranteed to a holder to protect the usage of its invention which should be novel, industrially applicable, non-obvious

Under Patent Act

Compulsory licensing :

- ① Patent Act allows for compulsory licensing where the product of the patent holder can be used without his permission
- ② Indian government has used in few medicines for treating Cancer in 2010
- ③ Dispute with Novartis against Compulsory licensing

④ Compulsory regime is to ensure:

- Availability of cheap medicines  
for threatening diseases

- During emergency use in pandemic  
like COVID-19

⑤ This threatens the pharma industry  
as they are vulnerable to patent  
usage without any gain

Compulsory licensing has been  
diluted in TRIPS agreement as well,  
therefore government should adhere  
to compulsory licensing provision only  
during emergencies with permission  
of pharma company.

9. Bring out the arguments surrounding the idea of employing the principle of 'one border - one force' on Indian borders. (150 words) 10

भारतीय सीमाओं पर 'एक सीमा-एक बल' के सिद्धांत का उपयोग करने के विचार के चतुर्दिक व्यास तर्कों को स्पष्ट कीजिए।

Ans) Indian borders which is porous & face difficult terrain, artificial demarcation requires presence of over 5 Lakh soldiers to protect from nefarious activities of neighbours.

Currently with Indian Army, BSF, ITBP, SSB, Assam rifles are guarding the borders → Multiplicity of forces

Favour of One-border-one-force

- ① Better compliance to border management as lack of coordination exists.
- ② Reduced expenditure of the central government in guarding by one border.
- ③ Reduced conflict between Ministry

of Home Affairs & Defense.

- ④ Better training possibility and reduce redundancy in training.
- ⑤ Communication smooth

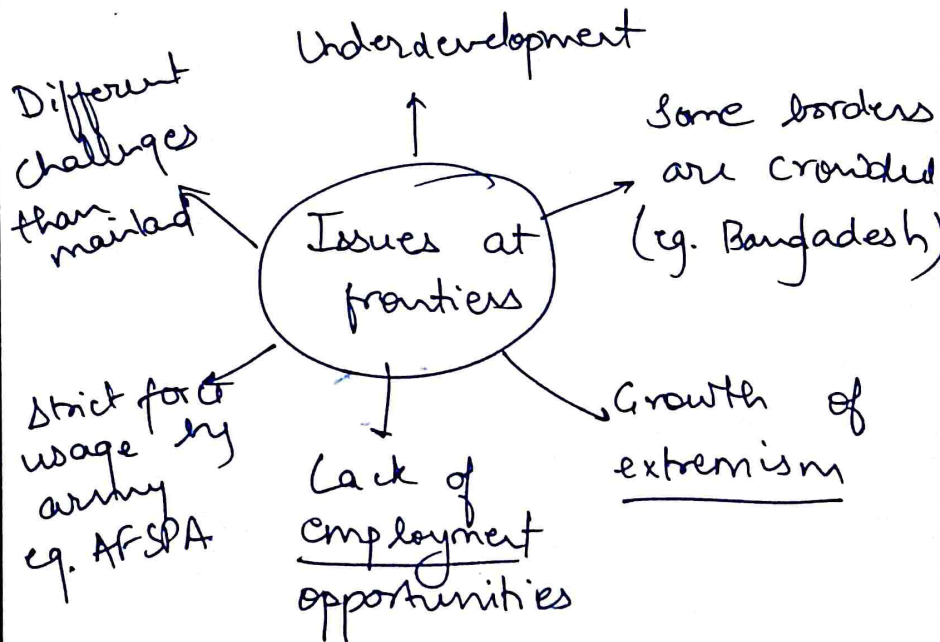
Against One border - one force!

- ① Reduced deployment of forces might lead to advantage to enemy.
- ② Expertise is brought by each force
  - ↳ (eg) BSF in patrolling, development while Army in fighting, arms usage
- ③ Reduced employment in any one force

Therefore, even though there can be issues with one-border-oneforce, still it should be taken forward with training, and addressing the loopholes.

10. Assess the need to create a new cadre of Indian Frontier Administrative Service to undertake the vital tasks at Indian frontiers. (150 words) 10  
भारतीय सीमांतों पर महत्वपूर्ण कार्यों को संपादित करने के लिए भारतीय सीमांत प्रशासनिक सेवा का एक नया संवर्ग बनाने की आवश्यकता का मूल्यांकन कीजिए।

Ans) Indian frontiers are guarded by army, CAPFs and local police but need several other initiatives like better border development



Indian Frontier Administrative Services

- ① Accelerate Border Area Development Programme by identifying key

sectors like education, health infrastru  
cture, roads, bridges, water, sanitation

- ② Develop new law & order principle to counter insurgency, militancy etc
- ③ Counter excessive trafficking of drugs, money (fake currency), cattle, arms, human etc.
- ④ Moral support to local people against threat of terrorism & war
- ⑤ Employment opportunities in
  - Horticulture
  - Livestock
  - Forestry
  - Assisting border troops
- ⑥ Intelligence at border with development of CIBMS & coordination among local police & army, BRO

IFAS can be a significant step towards protecting borders from insurgents & malafide activities & secure the frontiers & improve life at border

11. The main objective of Union Budget 2020-21 is to provide "Ease of Living" to all citizens. Analyse the framework proposed in the Budget 2020-21 to achieve this objective. (250 words) 15

केन्द्रीय बजट 2020-21 का मुख्य उद्देश्य सभी नागरिकों को "ईज ऑफ़ लिविंग" (जीवन सुगमता) प्रदान करना है। इस उद्देश्य को प्राप्त करने के लिए बजट 2020-21 में प्रस्तावित ढांचे का विश्लेषण कीजिए।

Ans) The annual financial statement presented by The Finance Minister had proposed ease of living from ease of doing business.

Budget 2020-21:

- ① ease of doing business :
  - (a) Reduction in corporate tax rates.
  - (b) Ease of credit facility - Digital India
  - (c) Foreign trade ease through digitisation, easy forex exchange
  - (d) regulation in labour laws
  - (e) Development of SEZ, EEZ
  - (f) Control of fiscal deficit up to 3.4%

② Social & welfare intervention:

- Education - increased funding, new colleges in every district  
New education policy
  - Health - AIIMS everywhere, expansion of Ayushman Bharat, AYUSH
  - Technology - Quantum Mission, solar expansion, robotics
  - Energy - Renewable (175GW by 2022), solar farms in fields, railway over the top solar panels
  - Women & Child - maternity benefit, gender budgeting,
  - Agriculture - storage, cold chain, food processing development, DBT etc
  - Individual IT payer - rationalisation of slabs with reduced exemptions
  - welfare to tribals, SC, OBC
- Budget 2020-21 was a milestone in easing life of citizens of all sections

with needs of people taken into consideration and making \$5 Tr economy by 2025. Next budget would be reform oriented with more government spending & packages to revive growth

12. Several challenges are needed to be addressed to realise the full benefits of the recent agricultural marketing reforms. Discuss. (250 words) 15  
हालिया कृषि विपणन सुधारों के पूर्ण लाभों को साकार करने के लिए अनेक चुनौतियों का समाधान करने की आवश्यकता है। चर्चा कीजिए।

Ans) 52% of Indian population depends on agriculture which contributes just 16% to India's GVA.

Several laws restricted the growth of agricultural in India. These laws failed to provide 'One nation, one market' to farmers.

Recent laws to reform agriculture marketing

Farmers can sell their produce anywhere in the country

Lesser influence of intermediaries & better price delivery

Farmers trade produce trade & Commerce Act

Removed mandi tax & other charges in APMC for higher profits.

Farmer can directly sell to a private player

Contract with  
the private  
players for upto 5  
years

Technological  
upgradation of  
farms

Contract  
farming

Guaranteed price  
delivery & insur  
ance to hazards

Development of  
food processing  
& investments.

Essential Commodities Act, 1955 diluted:

- ① Stock the produce for better price
- ② Develop cold storage & supply chain
- ③ Develop food processing
- ④ FDI in agriculture

Challenges to be addressed:

- ① Farmers ~~to~~ produce trade & commerce:
  - Ⓐ Apprehension of losing APMC markets as farmers would sell outside it in private capacity.
  - Ⓑ Reducing MSP procurement due to collapse of APMC needs to be addressed & assured

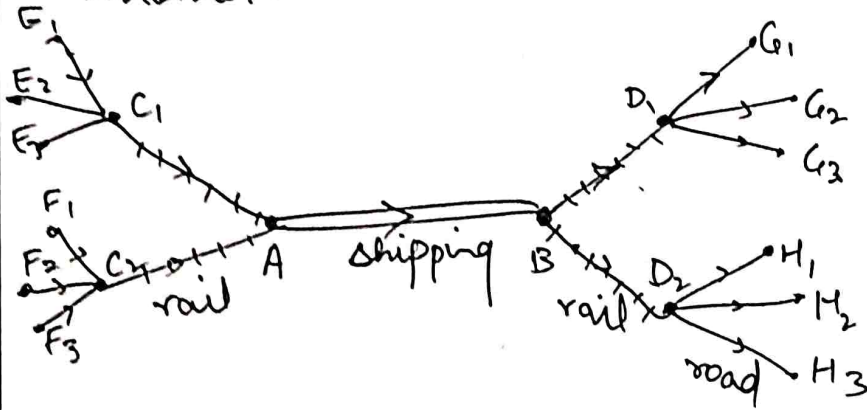
- (c) Losses to traders, intermediaries & middlemen are possible
- (d) Reduced price discovery as is happening in Bihar who abolished APMC in 2002
- (2) Contract farming :
- (a) Address the issue of land mortgaging issues among farmers as part of contract
- (b) SDM office is under threat of corporate influence, hence civil appellate
- (c) Losing out land by farmers & corporates leaving contract midway
- (3) Essential Commodities Act :
- (a) Increased prices & inflation due to stocking
- (b) Influence of middlemen increased

Due to ongoing farmer's protest, several issues in the reforms have been revealed which should be addressed by consulting all stakeholders for increasing income

13. Multimodal transport requires multiple integrations across different modes of transportation. Substantiate. What are the challenges and opportunities associated with multimodal transportation for India? (250 words) 15

बहुविध परिवहन (मल्टीमॉडल ट्रांसपोर्ट) के लिए परिवहन के विभिन्न साधनों के मध्य विविध रूप से एकीकरण की आवश्यकता है। पुष्टि कीजिए। भारत के लिए बहुविध परिवहन से जुड़ी चुनौतियां और अवसर क्या हैं?

Ans) Multimodal transport refers to use of different modes of transport (air, rail, road, shipping) for carriage of any good from one place to another.



Multimodal transport in above example requires integration of road transport, railways & ship to transport goods from  $E_1, E_2, E_3, F_1, F_2, F_3$  to  $G_1, G_2, G_3, H_1, H_2, H_3$  via  $C_1, C_2, A, B, D, D_2$ .

Integration:

- ① Integration of time so that when one transport mode reaches other is ready.
- ② Integration of space & fuel → savings in fuel as the truck which brings back raw material can carry back finished products.
- ③ Supply chain management
- ④ Reducing cost with optimization

Challenges with multimodal transport:

- ① Development of all modes are required to achieved integrity.
- ② Supply chain & operational constraints
- ③ In India, waterways is only available in eastern India & coastal states.
- ④ Lack of infrastructural development of nodal points for goods loading & off-loading.

③ Different costs & timing of different modes.

↳ (Eg) Roadways is expensive & quicker than waterways.

### Opportunities of multimodal transport

- ① Reduce and optimise cost
- ② Non perishable products like coal can be transported cheaply → reduce electricity cost
- ③ Reduce logistics cost from present 14% of GDP
- ④ Development of all sectors & employment generation
- ⑤ Infrastructure at nodal points

Multimodal transport should be developed like the one near Prayagraj by combining national waterways development, Sagarmala & Bharatmala projects as part of National Infrastructure Pipeline (NIP)

14. Though COVID-19 pandemic exposes the vulnerability of Informal sector and associated labor force in India, it also presents an opportunity to rebalance formal-informal economy dynamics in the country. Discuss.

(250 words) 15

हालांकि, कोविड-19 महामारी भारत में अनौपचारिक क्षेत्रक और संबद्ध श्रम बल की सुभेद्यता को उजागर करती है, लेकिन साथ ही यह देश में औपचारिक-अनौपचारिक अर्थव्यवस्था की गतिशीलता को संतुलित करने का एक अवसर भी प्रस्तुत करती है। चर्चा कीजिए।

Ans) Informal sector makes 93% of the Indian workforce. Informal sector lacks several benefits exposed to formal sector like social security benefits, guaranteed employment, pension, insurance, EPF etc.

Vulnerability of Informal sector.

- ① Huge layoffs & loss of employment of 80% informal jobs observed during COVID pandemic
- ② No savings with people due to meagre earnings.
- ③ Lack of insurance to cover hospital costs in case of contracting viruses

④ Unhygienic conditions of living due to low salaries & lack of affordable housing.

⑤ Couldn't travel back to rural areas

⑥ Lack of provision of salaries under Employer provident fund.

⑦ Unavailability of another job due to skill inadequacy & lack of training

Opportunity to rebalance the formal-informal dynamics:

① Formalisation of sectors like MSME is needed  
↳ using taxing the business, providing credit

② Social security to informal sectors under PM Garib Kalyan Yojana.

③ Increase jobs opportunities in urban areas under formal sector like public infrastructure

- ④ Provision for affordable housing  
renting complexes (ARHCs), better  
healthcare, transport availability at  
cheaper cost would ensure better  
living conditions.
- ⑤ Skill development by strengthening
- PM Kaushal Vikas Yojana
  - Skill India Mission
  - Apprenticeship program
- ⑥ Development of entrepreneurship  
activities (Economic survey 2019)
- ⑦ Develop job in formal sector (private  
& public) in Tier 2-3 cities.

Formalising the economy is crucial to  
improve living standards of workers &  
hedge them from unexpected  
contingencies like COVID-19. Government  
should in immediate focus extend  
formal sector benefits like pension,  
insurance etc to informal sectors

15. Highlight the drivers and challenges facing India's ambition to become a gas-based economy. Mention the steps that have been taken by the government recently in this regard. (250 words) 15

गैस आधारित अर्थव्यवस्था बनने की भारत की महत्वाकांक्षा के चालकों और सामना की जाने वाली चुनौतियों को रेखांकित कीजिए। इस संबंध में हाल ही में सरकार द्वारा उठाए गए कदमों का उल्लेख कीजिए।

Ans) More than 70% of India's energy is derived from coal & crude oil products like petrol, diesel etc. Gas energy contributes less than 5% in India's energy basket primarily in

- CNG in vehicles
- fertilizers & chemical production
- Piped gas to households

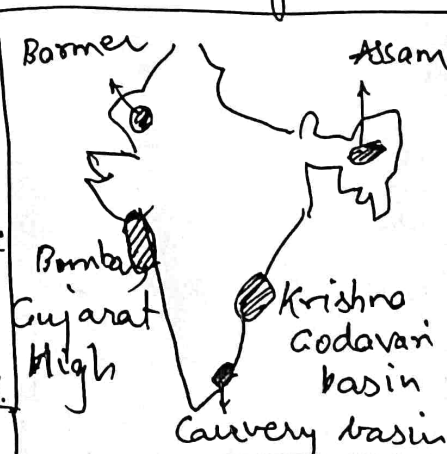
Drivers to Gas based economy:

- ① India has higher reserves of gas than crude

in Krishna Godavari basin, Assam,

Cauvery & offshore Bombay high

↳ Can meet upto 30% of domestic needs



- ② Decrease the outflow of foreign exchange
- ③ Less polluting than crude oil products & coal
- ④ Easy to transport across pipelines throughout the country
- ⑤ Multiple uses in fertilizers, plastic, chemical manufacturing

### Challenges in Gas based economy:

- ① Lack of infrastructure technology with GAIL to extract gas -
- ② Gas reserves are in water filled areas & deep inside → difficult
- ③ Reduced strategic partnerships with gas exporters like Russia, Qatar, UAE, USA.
- ④ Specialized motors & engines required to run gas transport
- ⑤ Expensive in transport + high pressure

Steps taken by Government.

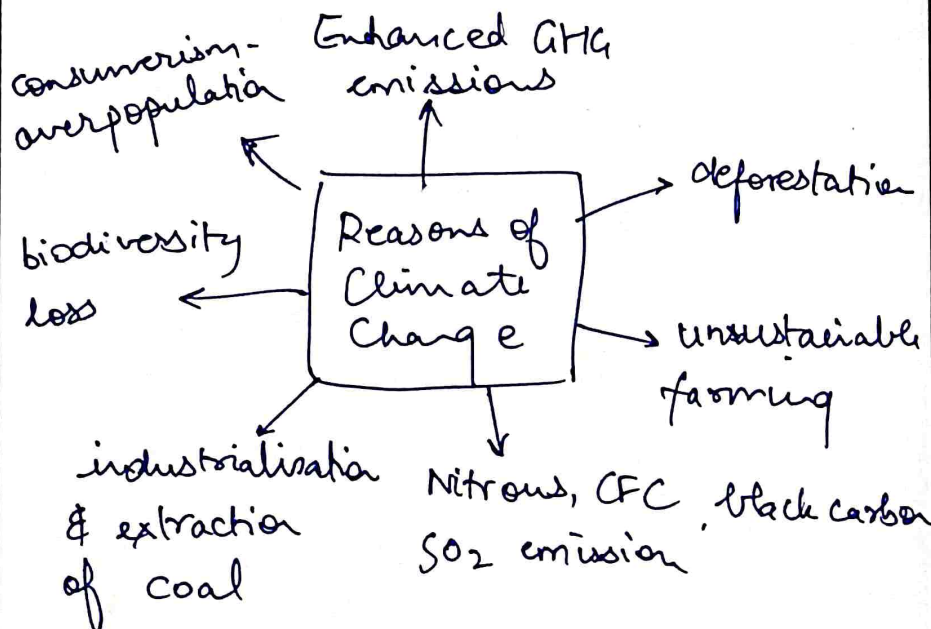
- ① Development of pipelines network across the country.
  - ┆ National Gas Grid
  - ┆ Gas pipeline network in North-East
  - ┆ Long distance pipeline like HVJ, Kerala Coast, etc
- ② Compulsory use of CNG vehicles in most cities, incentives & subsidies
- ③ Promotion of pipelines to households in Delhi, Mumbai etc
- ④ Empowering GAIL & private players to extract gas & easy production

Despite increased reliance on gas based economy which is cleaner than crude & coal, efforts should be made to completely shift to renewable energy sector gradually using measures like 175 GW renewable electricity by 2022

16. Climate Change and the associated events endanger the marine and coastal ecosystems while increasing the vulnerability of coastal population.  
Examine. (250 words) 15

जलवायु परिवर्तन और संबद्ध घटनाएं तटीय जनसंख्या की सुभेद्यता को बढ़ाते हुए समुद्री एवं तटीय पारिस्थितिक तंत्रों को खतरे में डालती हैं। परीक्षण कीजिए।

Ans) Average temperature on Earth has risen by 0.8°C between 1800 & 2010. This is expected to cross 2.5°C if enough steps are not taken.  
Sea level is rising by 0.8mm per year at several places and upto 3mm/year in Indian Ocean. (IPCC)



## Threat to Marine & Coastal Ecosystem

- ① Denudation of sea beaches & coastal areas near to oceans & seas  
↳ (e) Jakarta is fastest sinking in the world
- ② Loss to biodiversity of coasts like corals, mangroves, littoral species. (70% corals already lost)
- ③ Increase sea surface temperature will kill many species.
- ④ Decreased productivity by sea weeds, seagrass & phytoplankton.
- ⑤ Decrease ability to capture CO<sub>2</sub> & O<sub>2</sub> → resulting in asphyxiation of biodiversity.
- ⑥ Creation of dead zones in marines

## Vulnerability to Coastal population

- ① Submerge of cities, coasts, fields in densely populated region.  
↳ Rehabilitation.

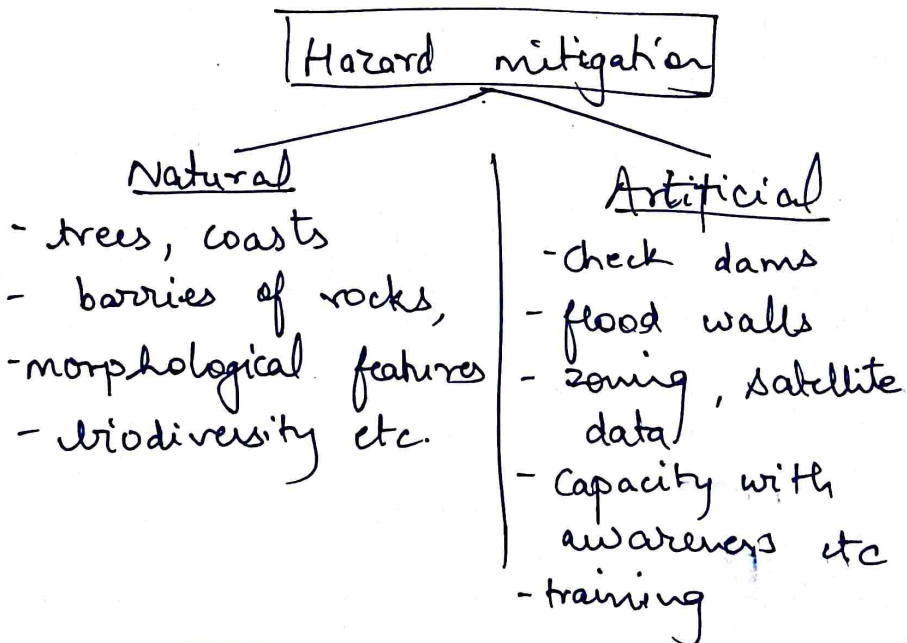
- ② Loss of livelihood to coastal community due to fishing decline
- ③ Climate change hazards like cyclone floods would lead to loss of livelihood & income security with life.  
↳ (Eg) Amphan cyclone caused salinisation
- ④ Loss of tourism due to coral loss in countries like Maldives
- ⑤ Increased cost of mitigation, preparedness & rehabilitation
- ⑥ Threat to biodiversity would cause threat to 30% of world population who reside on coast & dependent on them.

Therefore, adherence to Paris principle, UNFCCC guidelines, IPCC reports with domestic policies like Coastal Regulatory Zones, EIA, switch to renewable energy etc are necessary to avert this threat.

17. Using examples, highlight how natural ecosystems perform different hazard mitigation functions. (250 words) 15

उदाहरणों का उपयोग करते हुए, रेखांकित कीजिए कि प्राकृतिक पारिस्थितिक तंत्र किस प्रकार अलग-अलग संकट के शमन का कार्य करते हैं।

Ans) Hazard mitigation refers to practise of risk reduction & preparedness for a disaster to ensure minimum risk to local community & maximum capacity to cope up.



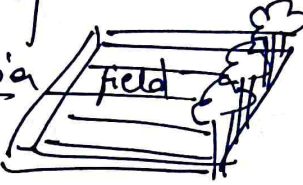
(Natural Ecosystems as hazard mitigators)

① Coastal trees can act as protection to floods, storm surges, cyclones

- ↳ (eg) Mangrove trees protected vast stretches of land during Amphan cyclone. from saltwater incursion
- (2) Corals also protect the coasts from pollution of oceans, warming of oceans & tsunami.
- ↳ (eg) Maldives was relatively less disturbed by 2004 tsunami in Indian Ocean
- (3) Trees on mountains protect from natural landslides
- ↳ (eg) in Uttarakhand, North East
- (4) Levees, flood walls & trees on corners of rivers protect from flooding
- (5) Dense forest regulate precipitation & mitigate from droughts
- (6) Urban forestry reduce heat island effect → hence reducing chances of urban floods.

⑦ Animals regulate the food web of the forests thus ensuring sufficient food availability.

⑧ Shelter farming, planting trees prevent desertification & degradation of agri lands.



↳ (eg) Great green barrier in Sahara desert

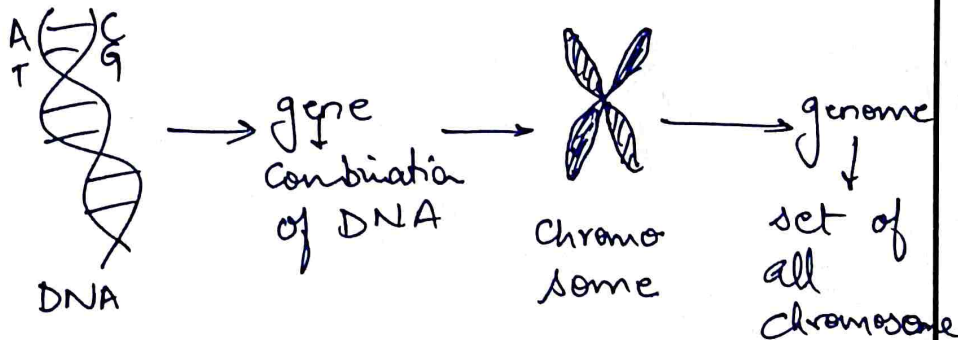
⑨ Afforestation protects from soil erosion & hence from flooding & groundwater loss.

Natural ecosystems have been performing crucial duty of hazard mitigation since ancient times & protection of natural ecosystems through techniques like Biorock (corals), nagar van, social forestry, community reserves etc should be performed & made part of NOMA guidelines on hazard mitigation.

18. Explain what genome sequencing is and state the challenges in scaling up genome sequencing projects. Also, throw some light on the recently launched IndiGen Project. (250 words) 15

ब्याख्या कीजिए कि जीनोम अनुक्रमण क्या है और जीनोम अनुक्रमण परियोजनाओं को बढ़ावा देने में विद्यमान चुनौतियों का वर्णन कीजिए। साथ ही, हाल ही में आरंभ की गई इंडिजेन (IndiGen) परियोजना पर कुछ प्रकाश डालिए।

Ans) Genome is the data set of all the DNA present in an organism which dictate the phenotype & genotype of that organisms.

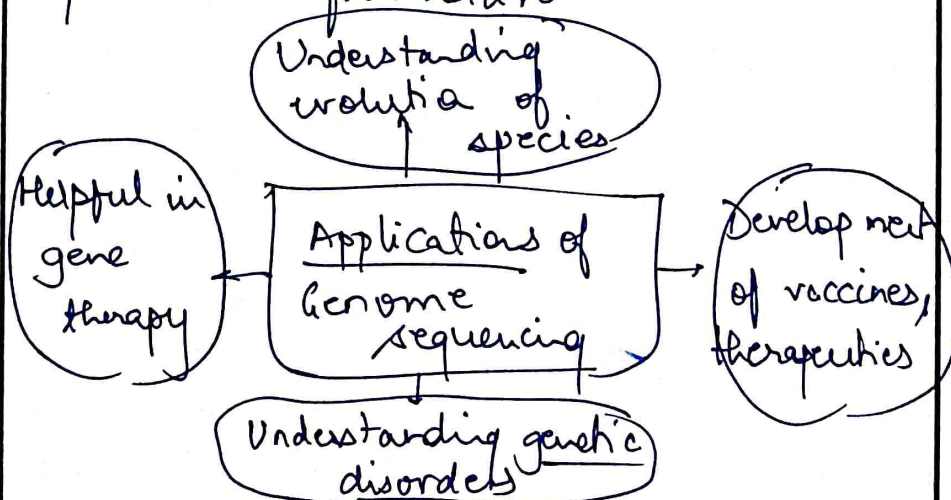


Genome sequencing is knowing the orderly arrangement of DNA that makes the genome. Human genome has more than 3-bn DNA pairs while COVID-19 had 10000 RNA pairs

Use of computational methods with techniques like transcription, translation etc

## Challenges in Genome Sequencing:

- ① long drawn process as it takes days to sequence the genome
- ② Lack of enough skilled manpower trained in biotechnology
- ③ Lack of funds provided to research labs, universities.
- ④ low infrastructure availability
- ⑤ Lack of understanding in applications of genome sequencing.
- ⑥ Reduced interests among policymakers to infuse funds, setup labs & provide infrastructure



## Indigen Project :

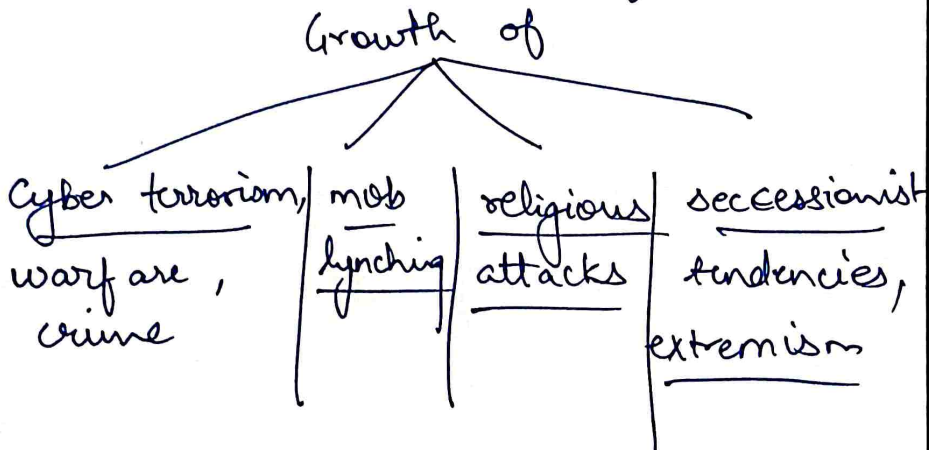
- ① Implemented by DBT-CSIR to map genome of 1000 Indian individuals.
- ② Diverse set of individuals would be taken from the country
- ③ To understand the common genes among Indians, prevalence of certain traits & characteristics, evolution studies
- ④ Development of genetic & rare disorders knowledge & medicines
- ⑤ Reduced reliance on foreign race genome sequence

Genome sequencing has gained traction with several projects like Human Genome Project, Genome Atlas and advent of COVID-19 pandemic & contribution of Indians to USAID.  
Funds should be increased & earmarked for training & growth of field

19. India needs to avert radicalisation and societal dissention, as internal faultlines are a breeding ground for cyber and transnational terrorism. Discuss. (250 words) 15

भारत को कट्टरपंथीकरण और सामाजिक मतभेदों को रोकने की आवश्यकता है, क्योंकि आंतरिक दरारें साइबर एवं पार-राष्ट्रीय आतंकवाद का जनन स्थल होती हैं। चर्चा कीजिए।

Ans) Growth of radical ideas, ideology based terrorism (ex left wing extremism, right wing fundamentalism) has led to severe threat to peace of the Indian society.



Growing radicalisation & internal dissention

- ① Left wing extremism due to Naxalism & Maoism has spread to over 90 districts & the most serious internal threat to peace

② Mob lynchings due to fake news,  
religious alleviation of sentiments

↳ (eg) Beef carrier lynching

③ Communal riots due to increase  
religious radicalisation, fake news.

↳ (eg) 2002 Gujarat riots, 2012  
Muraffamagan riots

④ Ethnic dissention has lead to  
north-east extremism & terrorism

↳ (eg) Naga militancy etc

⑤ Regional & religious dissensions  
leading to separatism & secessionism

↳ (eg) Khalistan, Bodoland, Gorkhaland  
Vidarbha

### Cyber & Transnational Terrorism:

① Fake news causing cyber crimes,  
cyber terrorism & warfare.

↳ (eg) Exodus of NE people from Bangladesh

- ② Use of social media like Whatsapp, Twitter to spread communal ideas  
↳ (eg) ISIS on twitter
- ③ Hacking, phishing, cyber attack, harassment, denial of service causing radicalisation & disruption of peace
- ④ Transnational crimes emerging from Pakistan who influence Kashmir militancy, Khalistani etc.
- ⑤ Organised criminal groups cooperating with transnational terrorists.  
↳ (eg) 1992 Mumbai Blasts after Babri Masjid demolition by Dawood

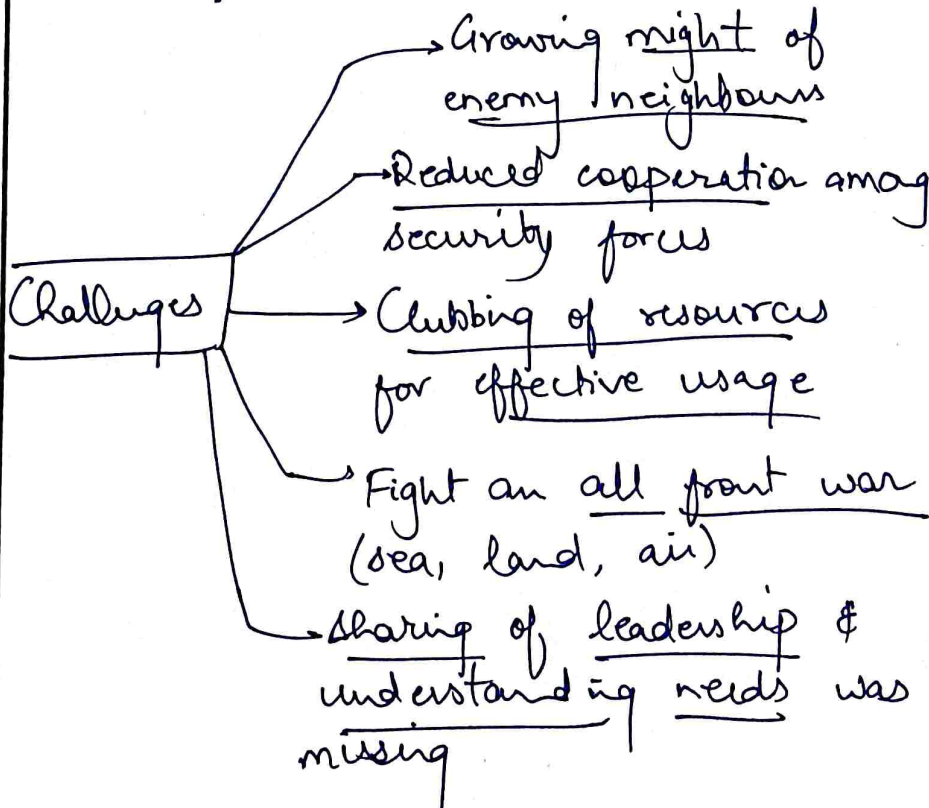
With increasing radicalisation & dissention, laws need be amended (eg. NIA, VAPA, NOPS etc) and strict law & order maintained with cooperation in IT (Budapest convention) and transnational terrorism through approving UNCITC.

20. Given the emerging security challenges, discuss why the establishment of Integrated Theatre Commands is being seen as an important defence reform. (250 words) 15

उभरती हुई सुरक्षा चुनौतियों को देखते हुए, चर्चा कीजिए कि क्यों एकीकृत थिएटर कमान की स्थापना को महत्वपूर्ण रक्षा सुधार के रूप में देखा जा रहा है।

Ans) Recently, Integrated Theatre Commands were approved as part of National Security Architectural reforms to ensure better redressal to law & order issues at borders.

### Emerging Security Challenges :



Theatre Commands are groups of highly trained but small military personnel who are lifted from different ~~or~~ defense sectors to provide a holistic strength to the command.

### Need for Theatre Commands:

- ① Will improve the training & capabilities of the soldiers by learning from other forces as well.
- ② Reduced the expenditure of the the military forces
- ③ Avoid working in silos that can benefit the enemy.
- ④ New theatre commands in all regions like Andaman & Nicobar Islands which is first tri-service command
- ⑤ Efficient use of equipments & synchronization of defence forces.

⑥ To be used according to the needs & capability of the enemy

Theatre Commands should be provided better autonomy, high leadership, effective training, strategic posting & discretion to develop their best practices after learning from foreign defense forces.