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GENERAL STUDIES (TEST CODE : 1524)

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Medium Eng./Hindi	Eng.	Registration Number	966377
Center	—	Date	15.12.2020

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Q. No.	Maximum Marks	Marks Obtained
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Total Marks Obtained:

Remarks:

INSTRUCTIONS

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

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।

Agriculture employs more than 50% of the workforce but contributes to only 16% of the GDP.

A major hindrance to agricultural growth is the inadequacy of tenancy reforms pursued post-independence.

Issues → fragmentation of land holdings
→ lack of collateral and documentation with tenants
→ poor investment and mechanisation.

Tenancy reforms can address these issues by empowering tenants and protecting lessors.

Model Land Leasing Act of 2016
provides for:

① formal tenancy agreements to:

- ensure safety of tenure to leasees to avoid unfair eviction
- fix rent beforehand in terms of cash or share of produce to avoid exploitation.
- provide documentation which tenants can use to avail bank credit.
- protect landowners from squatting.

② promote land consolidation which will • foster mechanisation

- boost formation of cooperatives

③ promote contract farming

states must pass legislation to implement this. The recent Farm Services Act, 2020 also provides similar measures. This can boost agricultural GDP & double farmer income.

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।

MSMEs form 40% of the Indian manufacturing sector and 45% of merchandise exports.

However, MSMEs are unable to effectively enter foreign markets as:

- ① Tendency towards "Dwarf firm" as held by Economic Survey 2019-20:
 - government support hinders initiative to grow
 - prevents economies of scale
- ② poor technology adoption, especially in textile industry.
- ③ poor access to bank credit.
- ④ high logistical costs in shipments, turnover time

Government Initiatives:① Better access to credit:

- MUDRA scheme for easy loans
- psbloans within 59 minutes
- Trade Receivables discounting system to allow pledging / trade of invoices

② Procurement:

- Government - e - Marketplace : 25% procurement from MSMEs
- special focus on women and SC-led MSMEs

③ export - support through:

- APEDA : provides packaging, quality checking to meet SPS standards
- EXIM Bank : insurance for exporters

④ Others: Make in India initiative, loan moratorium under Atmanirbhar Bharat, credit-linked subsidy, etc:-

MSMEs must be encouraged to grow to boost exports.

3. India's march towards inclusive growth and it 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।

Though India has witnessed double digit growth since LPG reforms of 1990s, Oxfam's Time to Care report shows that growth has not been inclusive.

Inclusive growth is intricately linked to achieving SDGs as:

- ① Poverty - growth must take place where poor live & rural areas, with resources the poor have - unskilled labour (SDG 1)
- ② food & nutritional security: (SDG 2)
 - agricultural sector needs focus as present growth is service-sector led.
 - women and SCs show high malnutrition.

- ③ public services - inclusive growth should cater to health and education through public-sector led or universal provisions. (SDG 3, 4)
- ④ climate action (SDG 13): climate change & natural disasters have greater burden on poor, women, and marginalised.
- ⑤ Decent work & economic growth for all (SDG 8) explicitly provides for inclusive growth.

Thus, inclusive growth & SDGs need to be pursued together, as recognised in Agenda 21.

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?

With multilateral trade regime under WTO breaking down, regional trading arrangements are the new normal.

Rules of origin ensure that only goods produced in the trading bloc get benefits. This curbs exploitation by external "free-riders".

For e.g., NAFTA 2.0 has stronger rules of origin to prevent Chinese goods entering USA through Mexico.

Steps by India:

- ① Demand for strong rules of origin in RCEP to prevent Chinese goods flooding India. The potential entry into RCEP in future requires this.
- ② concept paper submitted in WTO to suggest reforms including stronger rules of origin
- ③ Harmonised system of nomenclature of WCO made mandatory to trace origin of goods.
- ④ stricter border controls with Myanmar & Bangladesh to prevent third party goods.

However, India must increase cooperation with EU, ASEAN, etc:- to improve rules of origin & ensure fair trade.

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।

Minimum Support Price (MSP) was introduced during the Green Revolution to encourage farmers to boost production.

MSP assures a remunerative price for 23 crops and is decided by the Commission for Agricultural Costs & Prices (CACP).

MSP was created in an era of scarcity and has succeeded in ensuring food security.

Relevance in era of surplus:

MSP is considered outdated as:

- ① it hinders market-determination

of prices, preventing private sector entry in agribusiness & food processing.

- ② high fiscal deficit for Centre
- ③ depletion of ground water due to water-intensive crops like rice
- ④ poor nutrition due to overproduction of rice & wheat rather than cereals.

However, MSP can still be relevant as:

- ① Farmers cannot find remunerative prices in private markets.
- ② high input costs such as seeds, chemical fertilisers, etc:- necessitate assured market.
- ③ government procurement is necessary for PDS.

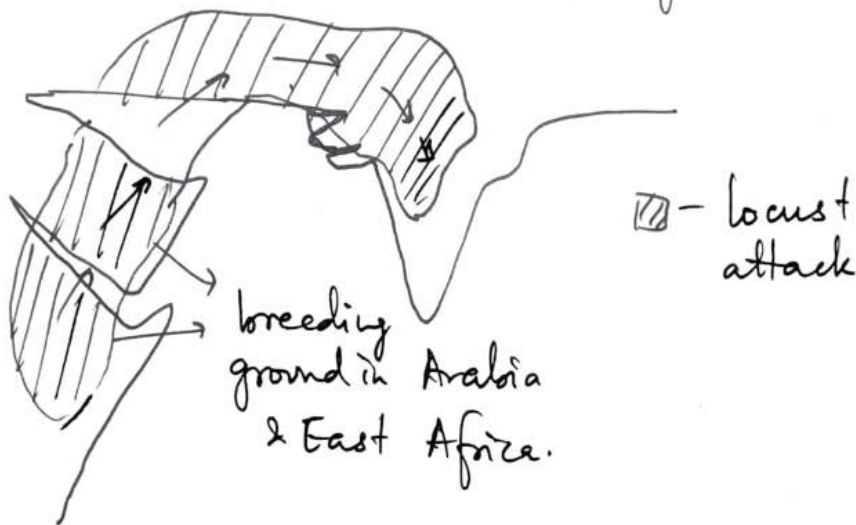
Hence, relevance of MSP is debated. While it can ensure support to farmers, it must be reformed to promote millets and encourage private sector entry.

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।

While locust attacks are a historical phenomenon, the magnitude and geographical extent of the 2020 locust attack was larger.



The recent locust attack is linked to climate change as:

- ① Abnormally high positive Indian Ocean Dipole lead to multiple cyclones in Arabian Sea region.

- ② Cyclones coupled with unseasonal rains in Eastern Africa promoted breeding of swarms of locusts by moistening the ground.
- ③ strong westerly winds took the swarms eastward towards India.

Thus, climate change which causes high sea surface temperatures and erratic rainfall promotes locust attacks.

India must cooperate with Pakistan, Iran, etc. to control the swarms in their resting phase.

The Locust Warning Centre at Jodhpur must coordinate with IMO to provide forecasts depending on weather patterns.

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।

Nanotechnology is a revolutionary advancement in science with far reaching applications.

Properties of Carbon nanotubes:

Carbon at molecular level has larger surface area compared to volume which ensures:

1. high tensile strength
2. high electrical conductivity
3. flexible nature - can be folded, twisted to make bucky balls & fullerenes.
4. thermal insularity

Applications:

① Medicine:

- precision delivery of drugs to

organs

- replacement of blood capillaries with carbon nanotubes.

② Waste remediation:

- clean oil spills
- extract heavy metals from water
- molecular sieves.

③ protecting equipment:

- bullet-proof jackets eg: Baba Kavach by BARC
- packaging equipment for fragile cargo

Thus, carbon nanotubes have several applications. India must scale up research to utilise their potential.

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।

India's domestic patent regime has been a bone of contention in WTO, with US pharma companies accusing India of weak IPR protection.

Indian law under Patents Act provides for:

- a) no patents in case of:
 - mere combinations of existing drugs
 - utility patents with cosmetic improvements in taste, etc:-
 - evergreening discouraged,
- b) compulsory licensing allowed in case of life saving drugs. eg: Cancer drugs allowed for production by Indian PEs.

c) protection to indigenous knowledge
and traditional medicine
eg: preventing patenting of turmeric,
tulsi, etc:-

Thus, Indian patent regime privileges
~~don~~ public health over pharma
industry's interests.

This has allowed Indian
companies to ~~real~~ make cheaper
generic drugs which India exports
to Africa, etc, reducing disease
burden.

However, it hinders investment
in R & D by pharma companies and
leads to disagreements under WTO.
India must promote more humane
patenting regime worldwide.

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 व्याप्त तर्कों को स्पष्ट कीजिए।

India has a land border of 15,000 km with 7 countries and a maritime border of 7,500 km.

Arguments for one border - one force :

- ① Security threats from each border are different.
 - e.g.: infiltration of terrorists from Pakistan
 - drug trafficking from Golden Crescent & Golden Triangle from Pakistan & Myanmar
 - insurgent movement in Northeast
 - state-led military aggression by China
- ② Terrain of borders is different:
 - evergreen forests with Myanmar,
 - crisscrossing rivers with Bangladesh

- Swamps, desert & thimalayas with Pakistan etc:-

② allows efficient policy making and troop deployment for specific border threats.

India has adopted One Border-One Force principle after 1962 war with:

- a) Border Security Force - Pakistan, Bangladesh
- b) Indo-Tibetan Border Police - China border
- c) Assam Rifles - Myanmar
- d) Sashastra Seema Bal - Nepal, Bhutan.

However, this can lead to redundancies and inefficient utilisation of resources.

With Central Armed Police Forces also deployed (eg: CRPF in Kashmir), it increases confusion and leads to security lapses. The policy can be reconsidered by National Security Council.

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।

India had a Frontier Administrative Service that served in North Eastern Frontier Agency (NEFA) after independence.

However, this was disbanded. Recently, there are calls to revive it and extend it to all frontiers.

Vital tasks at frontiers

- security of borders from: military aggression, drug & arms trafficking, human trafficking, etc.
- development of border regions: infrastructure; public services like health, education
- promote efficient border intelligence through surveillance equipment.

Additionally, troops manning borders must be managed and diplomatic responsibilities with neighboring states are present.

These diverse tasks require a cadre with diverse skill sets ranging from administration & diplomacy to policing and security.

Thus a new cadre of Indian Frontier Administrative Service is required.

However, there are already dozens of Central Services and a rationalisation of existing cadres is simultaneously required.

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

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

The Ease of Living Index by Ministry of Housing & Urban Affairs shows that Indian cities have a very poor standard of living.

Union Budget 2020-21 has aimed to provide "ease of living to all citizens".

Framework proposed:

① Affordable quality housing:

- PM Awas Yojana to provide credit-linked subsidy to developers, etc:-
- RERA Act to ensure quality houses
- new rental laws to promote rental housing for students & migrants.

② Easier commute in cities through:

- multi-modal transportation:
metro, public buses, e-rickshaw,
bicycle lanes
- last-mile & feeder connectivity of
buses to trains

③ Water supply:

- Jal Jeevan Mission aims for
pipd water supply to all rural
households by 2024
- rationalisation of water rates
by civic bodies
- improvement in quality as per
BIS standards.

④ Internet connectivity:

- Digital India Mission to improve
internet access through broadband
- public Wifi - PM-WANI.

⑤ Cooking fuel:

- PAHAL LPG subsidy
- PM Ujjwale Yojana

This will reduce fuel wood & kerosene consumption, decreasing indoor air pollution.

⑥ Air pollution:

- National Clean Air programme in 102 cities
- monitoring of air quality through National Air Quality Standards.

Thus, ease of living is to be promoted in a multi-dimensional sense.

This will improve health, increase productivity and secure a life of dignity to all, in line with SDGs.

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।

Agricultural growth rate has stagnated in India below 5% on average.

The recent agricultural marketing reforms aim to address this:

- ① Farmers' Produce Trade & Commerce Act, 2020:

- allows wholesale trade outside APMC mandis with no tax.
- this will promote private sector entry in agricultural sector, bringing capital & technology.
- it will allow farmers to get remunerative prices outside APMCs that are prone to cartelisation & politicisation.

② Farm Services Act, 2020:

- Agreement on Price Assurance provides for contract farming between farmers and traders or buyers.
- It will ensure assured market for produce, with dispute resolution mechanism.

③ Essential Commodities (Amendment) Act, 2020:

- price & stock limits to be imposed only in extraordinary circumstances.
- it will promote cold storage infrastructure and better prices to farmers & reduce wastage of produce.

Hence, these reforms aim to boost private sector entry, alleviate agrarian distress and ensure agricultural growth.

However, several challenges need to be addressed to realise their

full benefits :

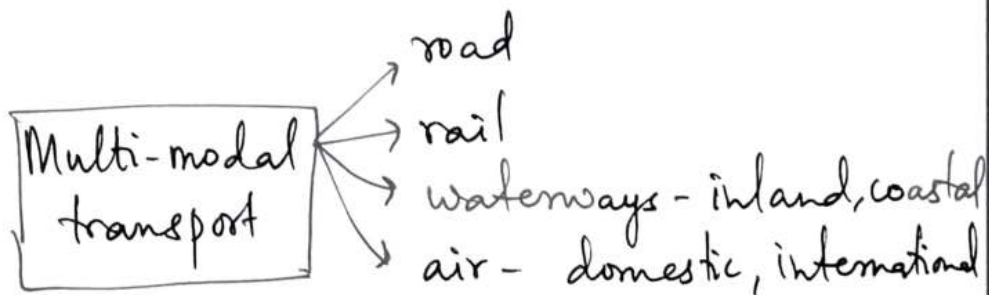
- ① fears of exploitation of farmers by private corporations that can monopolise the market.
 - proper dispute settlement needed.
 - regulation of private markets needed.
- ② awareness and literacy of farmers needs to be improved.
- ③ e-NAM should be promoted to develop a unified national market.
- ④ logistical costs must decrease through rural roads & lower freight charges.

Thus, the reforms if properly implemented & challenges addressed can double farmer income ~~and~~ by boosting agricultural growth.

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 में जुड़ी चुनौतियां और अवसर क्या हैं?

Since India has a varying terrain and larger geographical extent, multi-modal transport is a necessity.



It requires multiple integrations across different modes as:

- ① changes in terrain require different modes. eg: bus & railway terminals needed at banks of inland waterways.

Recently, Varanasi has been inaugurated as a multi-modal

terminal on NW-1

② hub and spoke model needed to reduce costs:

- port and hinterland connectivity:



- roads to act as feeders to railways
- public buses must feed metro stations in cities.

Challenges associated with multimodal transportation in India :

- a) high investment required: public sector alone cannot provide, as envisaged in National Infrastructure Pipeline.

- b) poor quality of existing roads, ports, etc:-
- c) problems in land acquisition & environmental clearances leading to delays.

Opportunities :

- ① Reduced fuel costs : eg: through waterways. This can:
- reduce carbon emissions & pollution
 - reduce oil imports
- ② improved connectivity :
- eg: waterways in North east through dense jungles

Thus, multi-modal transport must be encouraged across the country and in cities to decrease cost of transportation & improve ease of doing business.

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।

The informal sector employs more than 90% of the working population but contributes to only 50%- of GNP.

The COVID-19 pandemic has exposed vulnerability of informal sector labor force as follows:

- a) increased lay offs and non-payment of wages.
- unemployment rate has risen sharply.
- recent mob attack on iphone manufacturing unit near Bengaluru shows resentment for non-payment of wages.

b) distress of migrant workers shows:

- lack of social security
- highly tenuous job market

c) hindrances in shipments of goods has hit:

- farmers who are self-employed and unable to find buyers
- MSMEs that ~~seem~~ employ informal labour, due to falling inventory

However, the pandemic also presents an opportunity to rebalance formal-informal economic dynamics as seen in:

① recent labour codes: promote formalisation of workers through:

- a) raising permission requirement for retrenchment to 300 workers
- b) promoting fixed term employment

This allows the workers to avail social security such as provident fund, maternity benefit, bonus & overtime pay, etc:-

- ② formalisation of informal enterprises such as scheme for micro-food processing enterprises.
- ③ promote skill mapping and skilling to cater to new age jobs in manufacturing & service sector.
- ④ attracting FDI through Make in India will create more formal sector jobs.

However, India has to actively promote formalisation of workforce through schemes like PM Rozgar Yojana to curb exploitation of workers.

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।

Natural gas accounts for 6% of India's energy mix.

Drivers of India's ambition to become a gas-based economy:

a) commitment to curb climate change under Paris Agreement:

- need to increase green fuel
- reduce carbon emissions

b) easy to transport through pipelines from refineries to users

c) abundance in supply internationally (Middle East, Myanmar) & domestic exploration - coal bed methane, shale gas in KG basin, etc:-

d) promotes employment & economic growth.

Challenges:

1. technology overhaul needed in transportation: e.g.:
 - converting buses to use CNG requires investment like in Delhi
 - gas based engines not developed for major car brands, scooters, etc.- yet.
2. infrastructure: gas filling stations needed, pipelines required
3. safety protocol required to avoid gas leaks like in Baghjan, Assam.

Steps taken by government:

1. Created demand for gas through:
 - PAHAL LPG subsidy
 - PM Ujjwala Yojana to ensure faster adoption of gas.

2. Natural Gas Grid to promote nation-wide market
3. Gas Exchange to promote market-driven pricing & attract private investment.
4. Biogas promotion through Gobardhan scheme.
5. cross-border natural gas pipelines:
 - Amlekhpurj-Motihari pipeline to supply to Nepal.
 - pipeline from Shwe field in Myanmar to India.
6. PM Urja Ganga pipeline to provide gas to eastern India
7. reduced import tariffs.

Thus, India's path to a gas-based economy is challenging but promising.

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 खतरों में डालती हैं। परीक्षण कीजिए।

Carbon dioxide levels in the atmosphere have already increased to 0.04% from 0.03% of pre-industrial levels.

The resulting climate change endangers marine & coastal ecosystems as follows:

- ① marine heatwaves - destroy corals & fish population, deplete oxygen in seas
- ② ocean acidification - reduces rainfall, affects fish & tropical corals.
- ③ increased tropical cyclones - destroys coastal sand beaches and mangroves, causes large-scale damage to lives & property in coastal areas.
eg: Amphan, Nivar

④ Sea-level rise:

- makes coral reefs aphotic zones leading to bleaching
- inundation of low-lying areas causing climate refugees.
eg: recent migration from Andaman islands to Tamil Nadu.

⑤ Algal blooms:

- block sunlight for aquatic flora
- endanger fisheries & livelihoods for fishermen

⑥ Threat to coastal infrastructure such as power plants due to storm surges & tidal waves.

Thus, climate change presents a severe danger to marine & coastal areas.

Way Forward :

1. reduce climate change through enhanced commitments under Paris Agreement.
2. protect coastal communities through:
 - robust disaster management framework
 - reliant insurance policies.
3. improve mangrove belts near coasts
4. land reclamation as seen in Netherlands can be tried.

India must strive to achieve SDG 13 (climate action) and SDG 14 (protecting life below water) to protect coastal communities.

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।

The importance of natural ecosystems in hazard mitigation is recognized in Agenda 21 and the Sendai Framework for disaster risk reduction.

Different functions :

① Mangroves :

- prevent coastal erosion from tidal waves & tsumamis
- check wind speeds during cyclones
- reduce impact of storm surges & cyclones on coastal communities.

② Coral reefs :

- protect shoreline from strong waves & tidal bore.

③ forests on hill slopes:

- reduce mass movements & land slides
- provide structural stability to soil.

④ Mountain ranges:

- protect from cold winds
eg: Himalayas protect India from Arctic winds, unlike USA where blizzards can wreak havoc.
- check dust storms
eg: Aravallis prevent dust-laden winds from entering Delhi

⑤ Wetlands:

- act as riparian buffers to reduce floods
- allow water recharge in

underground aquifers to prevent droughts.

Thus, natural ecosystems are significant in hazard mitigation.

India must incorporate this in the National Disaster Management Policy and promote:

- afforestation in Himalayas & Western Ghats to prevent landslides
 - mangrove belt along coasts
 - restoration of wetlands
- etc:-

This is essential to reduce disruptions in economy & protect lives from natural disasters.

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।

Genome sequencing is deciphering the sequence of DNA base pairs in the chromosomes of a species to mine genetic data.

In recent years, genome sequencing has become cheaper and faster due to CRISPR-Cas9 technology.

Challenges in scaling up :

- ① Human genome has 3 billion base pairs which differ according to ethnicity and the individual. This requires collection of large samples.

- ② privacy concerns: sequenced genomic data can be misused or sold.
Patient's consent is required.
- ③ Animal rights: animal genome sequencing can torture animals.
- ④ poor equipment available & large investment required
- ⑤ lack of trained personnel.
- ⑥ poor legislation to regulate it.

The IndiGen project of CSIR and other research institutions plans to sequence the Indian genome through volunteers.

Applications:

- ① [Medicine]:
 - precision medicine as per genetic requirement.

- promote research on neglected tropical diseases such as thalassaemia.

② Anthropology:

- Indian ancestry and genetic modifications over generations can be traced.

However, the project needs to be complemented by strong regulation to prevent misuse of genomic data and ensure rights of the individuals.

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।

India is highly prone to trans-national terrorism which is increasingly coming through the cyber route.

Internal faultlines are a breeding ground for this as:

- a) polarisation on lines of religion and caste can lead to radicalisation of youth

e.g. recent arrests of youth in Kerala indicate it.

- b) denial of autonomy and democratic freedoms can cause people to rebel against the states leading to societal dissention.

c) growth of social media has promoted radicalisation over Facebook, etc:- This promotes lone-wolf attacks.

d) external states such as Pakistan and terrorist groups such as ISIS can take advantage of internal faultlines to promote attacks.

eg: Pakistan's strategy of bleeding India with a thousand cuts.

Way Forward :

India needs to avert radicalisation and societal dissention through:

- ① increasing communal harmony and spirit of brotherhood as found in Article 51A (fundamental duty)

- ② promote proper education of minority communities through liberal interpretations of holy texts to reduce religious terrorism.
- ③ enforce regulations on social media to flag keywords related to terror.
- ④ ensure inclusive growth and economic opportunities for all communities.

Radicalisation is a major threat across the world in the 21st century, especially due to cross-border migration.

India must complement anti-radicalisation measures with enhanced security infrastructure & international cooperation through FATF.

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।

In the 21st century, warfare has morphed to become multi-dimensional and involves technology.

India faces several security challenges, mainly from:

- ① China in Himalayas and Indian Ocean
- ② Pakistan

Integrated Theatre Commands involve all three armed forces: army, navy and air force. India has one at Andaman & Nicobar Islands as a Tri-Services command.

They are an important defence reform as:

- ① They promote theatre-specific exercises and fighting capabilities
eg: • desert warfare led by tanks near Pakistan border
• mountain corps with airforce providing cover in himalayas
- ② reduce redundancies and promote efficient utilisation of resources.
- ③ enhance operational readiness through synergies between various forces.
- ④ the newly created cyber and space wings too are incorporated providing enhanced intelligence.

India is promoting the establishment of integrated theatre commands. This is seen in

- a) appointment of Chief of Defence Staff to oversee their creation and promote cross-service cooperation
- b) theatre-level exercises
eg: TROPEX.

Thus, the nature of warfare keeps evolving & India must reform its abilities to ensure security.