TEST CODE | 7 | 1 | 3 | 2 | 5 | 2

MGP FRC 2024

Time Allowed : Three Hours
समय : तीन घंटे

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Maximum Marks : 250
अधिकतम अंक : 250

GENERAL STUDIES / सामान्य अध्ययन

Name Of Candidate परीक्षार्थी का नाम	Snehith Chakka		
Roll No./अनुक्रमांक	1910127837	Medium/माध्यम	English ✓ हिंदी ☐
Center Code/परीक्षा केंद्र		Date/दिनांक	31/07/2024

*Center Code : For Online – 1900 / Delhi : Karol bagh – 1901, ORN - 1902, Mukharji Nagar - 1903 / Patna : Boring Rd. – 2001 / Hyderabad : Jawahar Nagar - 2101

INDEX TABLE / अनुक्रमणिका

Q. No. प्र.सं.	Max. Marks अधिकतम अंक	Marks Obtained प्राप्तांक
1		
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20		
Total/कुल अंक	250	

INSTRUCTION / अनुदेश

1. Please do furnish Name, Email, Roll No and Mobile in the answer sheet.
कृपया उत्तर–पुस्तिका में नाम, ईमेल, रोल नंबर और मोबाइल नंबर भरें।

2. There are **TWENTY** questions printed in ENGLISH & HINDI, all questions are compulsory.
उत्तर पुस्तिका में अंग्रेजी / हिंदी में **बीस** प्रश्न दिए गए हैं, सभी प्रश्न अनिवार्य हैं।

3. The number of marks carried by a question/part is indicated against it.
प्रत्येक प्रश्न / भाग के लिए निर्धारित अंक उसके सामने अंकित किए गए हैं।

4. 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.
उत्तर प्रवेश पत्र में अधिकृत माध्यम में लिखे जाने चाहिए, जो कि दिए गए स्थान में इस प्रश्न–सह–उत्तर (क्यूसीए) पुस्तिका के कवर पर स्पष्ट रूप से लिखा जाना चाहिए।

5. Word limit in questions, if specified, should be adhered to. Any page or portion of the page left blank in the Question-Cum Answer Booklet must be clearly Struck off.
प्रश्नों में शब्द सीमा, यदि निर्दिष्ट हो, का पालन किया जाए। प्रश्न–सह–उत्तर पुस्तिका में खाली छोड़े गये किसी भी पृष्ठ या पृष्ठ के भाग को स्पष्ट रूप से काट दें।

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Examiner's Discretion/मूल्यांकन कर्त्ता का विवेक :	Start Time/प्रारंभ करने का समय : 10:00 AM	End Time/समाप्त करने का समय : 1:00PM

Total Marks/कुल अंक :	Mode Of Examination/ परीक्षा की विधि :	Online/ऑनलाइन ☐ Offline/ऑफलाइन ✓

*Examiner's Discretion is the marks awarded at the discretion of the examiner based on your overall impression, on the basis of (but not limited to) your handwriting, presentation, use of diagrams, flowcharts, facts and figures or absolutely anything that he/she liked in your copy.

मूल्यांकन कर्त्ता का विवेक अंक आपकी लिखावट, प्रस्तुति, आरेखों के उपयोग, फ्लोचार्ट, तथ्यों और आंकड़ों या समग्र रूप किसी अन्य विषय वस्तु, जो मूल्यांकन कर्त्ता को आपकी कॉपी में पसंद आयी के आधार पर (लेकिन इन्हीं तक सीमित नहीं) पर दिए गए अंक हैं।

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ECN CODE/ ईसीएन कोड :	EG/ईजी : ① ② ③ ④ ⑤	Evaluation Date/ मूल्यांकन तिथि :

EXAMINER'S REMARKS

CRITERIA FOR THE FEEDBACK SECTION AT THE END OF EACH QUESTION

1. **AWIS = Answered What is Asked.** This means whether you have addressed the core demand of the question or not. Addressing the core demand of the question gets you an objectively fair score. It is examiner's perception if you have understood the question and if you know the answer in the first place. Creative answer writing, sometimes missing the core demand, may fetch very high or very low scores, and exposes your answer to the subjectivity of the examiner.
2. **CD & VA = Content Density & Value Addition.** Examiner will evaluate the quality and quantity of your content in the answer. In the same word limit and space limit have you (a) written what is asked (b) gone beyond what is asked (c) enriched answers through combination of (but not all!) suggestions, ideas, quotes, flowcharts, diagrams, facts and figures, data etc. This affects objective components of assessment.
3. **S & F = Structure & Flow** – Whether you have structured your answer properly or not. Whether the answer has been broken into parts and sub-parts and each part has been addressed appropriately or not. Whether the flow of the answer is maintained. Affects both subjective and objective components of assessment.
4. **P & R =** How your answer performs on the criteria of **presentation, ease of read, clarity and apparent effort** in writing the answer. This affects the subjective components of assessment.

Note: Students are expected to incorporate suggestions from the feedback provided in the answers. Discussion classes for the tests are also available online in your portal to aid in your preparation. Further, students are requested to see the good copies of the tests and learn from them. You can also discuss your copy with a Mentor and discover ways and means to improve your answers, or if you have any issues with this test / copy. Ask specific questions, to get specific answers.

EXAMINER'S REMARKS

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Q.1) Aditya L1 mission is an important milestone as India's first space based solar observatory. Enlist the major scientific objectives and the challenges of the mission. (10 marks, 150 words)

आदित्य L1 मिशन भारत की पहली अंतरिक्ष आधारित सौर वेधशाला के रूप में एक महत्वपूर्ण मील का पत्थर है। मिशन के प्रमुख वैज्ञानिक उद्देश्यों और चुनौतियों को सूचीबद्ध कीजिए। (10 अंक, 150 शब्द)

Aditya L1 is the solar observatory launched by India in order to enhance our understanding about Sun i.e our closest star.

| launch | → PSLV - XL
| Orbit | → Legrange point-1 between Sun & Earth

{ Important milestone }
→ India one of handful nations that have Solar observatory
→ Capability to launch complex missions
→ Perfect injution into L-1 Halo orbit

| Major objectives |

① Solar coronagraph - Aditya L1 will produce one of the longest solar coronagraph

ⓥ Solar spectrum study - to see the various emissions of Sun

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1

③ Solar plasma study and observe patterns in plasma emission

④ Sunspots and solar cycle monitoring by ensuring accurate detection of solar maxima and solar minima

Challenges

① Accurate placement of Aditya-L1 into L1 orbit - achieved successfully

② Deepspace working of instruments near the sun and high plasma bombardment

③ Accurate readings and sending data in real time.

ISRO had overcome all the above challenges and shown that it can undertake complex solar missions like NASA, ESA.

Q.2) Describe briefly what gene therapy is and what advantages it has over other treatments?
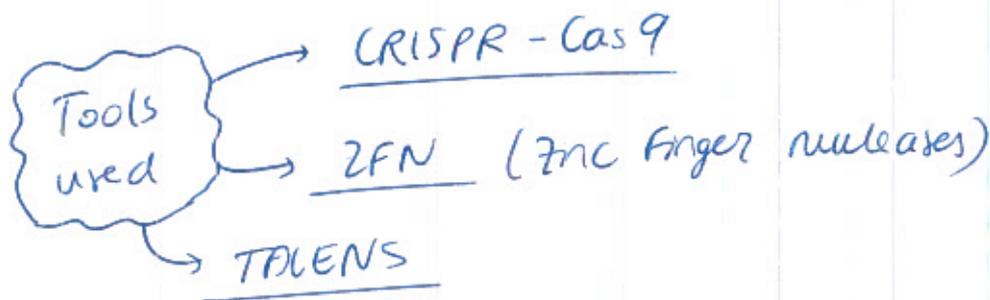
(10 marks, 150 words)

संक्षेप में जीन थेरेपी का वर्णन कीजिए और अन्य उपचारों की तुलना में इसके फायदों को सूचीबद्ध कीजिए?

(10 अंक, 150 शब्द)

Gene therapy is the emerging treatment that aims to cure genetic disorders by replacing defective gene with a corrected gene

Ex: Sickle cell anamia.
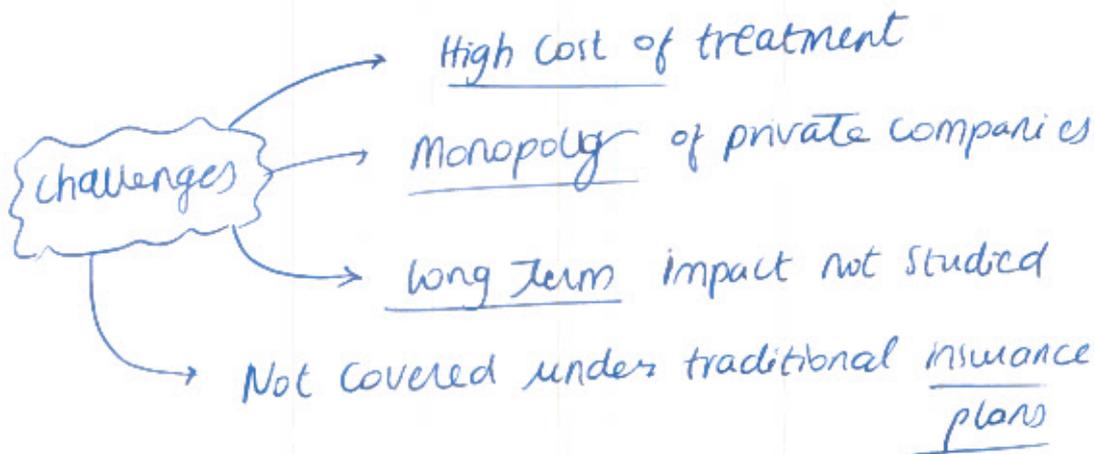
Tools used → CRISPR - Cas9

→ ZFN (Zinc finger nucleases)

→ TALENS

Advantages

① Guaranteed cure where cure is not available by traditional methods

② Ease of treatment - in some cases an injection can be sufficient to cure genetic disease.

(3) Limited side effects as gene therapy tend to be much more accurate than traditional methods

(4) Targetted approach - in various cancers gene therapy can specifically target particular cancer cells and leave healthy cells

```
                          → High Cost of treatment

 ⎧ challenges ⎫           → Monopoly of private companies

                          → long Term impact not studied

                → Not covered under traditional insurance
                                                    plans
```

Gene therapy is a boon to many people but there is a need to enhance R&D to reduce Cost and improve effectiveness

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Q.3) With recent advances in technology, robots are now equipped to perform more than just conventional and routine tasks, which brings new opportunities as well as risks. In this context, evaluate the future potential of the robotics sector. (10 marks, 150 words)

प्रौद्योगिकी में हाल की प्रगति के साथ, रोबोट अब पारंपरिक और नियमित कार्यों से कहीं अधिक करने में सक्षम हैं, जो नए अवसरों के साथ-साथ जोखिम भी लाता है। इस संदर्भ में रोबोटिक्स क्षेत्र की भविष्य की क्षमता का मूल्यांकन कीजिए। (10 अंक, 150 शब्द)

Robotics is rapidly advancing and moving towards autonomous and humanoid robots   Ex   Tesla robot
                    Boston dynamics robots

───────────────────────────
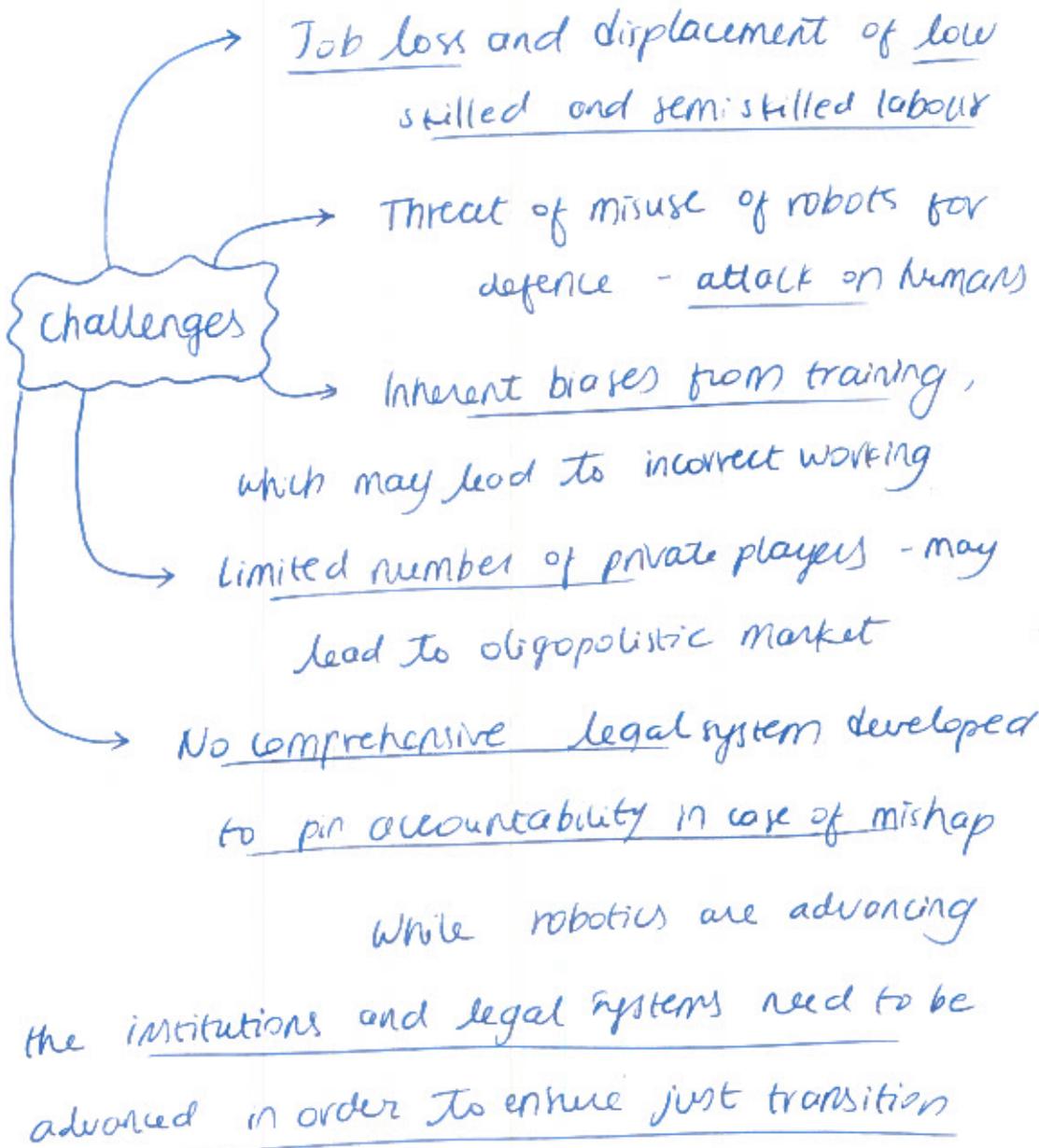│ Future potential of robotics sector │
───────────────────────────

① Performing complex taks

   Ex Spot robot - inspecting buildings, power lines

② Autonomous robots that can perform tasks
   without any intervention
            Ex Warehouse management
                Driverless cars

③ Automating manufacturing plants and heavy
   industry with advanced robots

④ Robots in autistic field

Ex: Robotic Cameras used for cinema shooting

(5) Defence and security enhancement

Ex: Mine detection

ROWS - Remotely operated weapon systems

{Challenges}

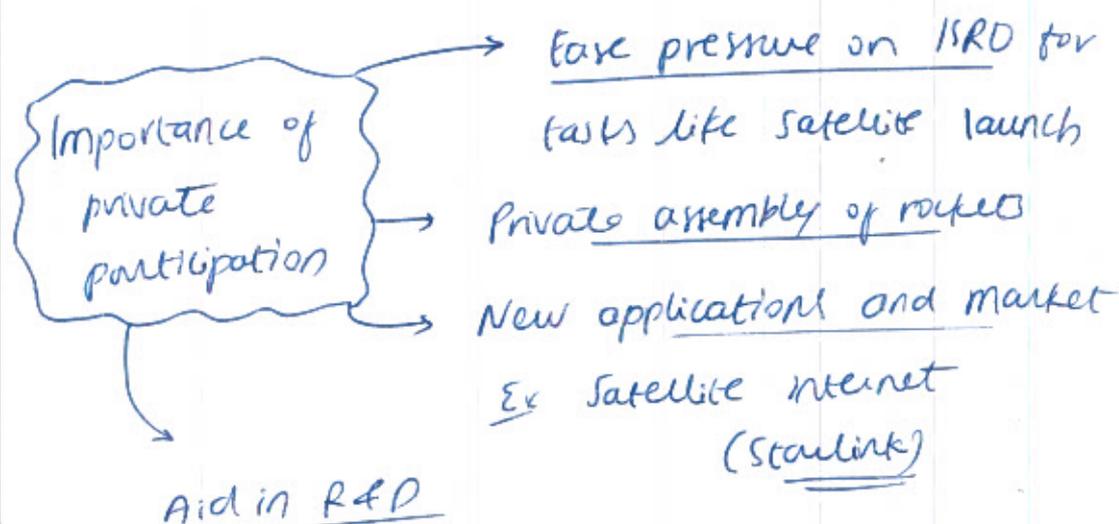→ Job loss and displacement of low skilled and semi skilled labour

→ Threat of misuse of robots for defence - attack on humans

→ Inherent biases from training, which may lead to incorrect working

→ Limited number of private players - may lead to oligopolistic market

→ No comprehensive legal system developed to pin accountability in case of mishap

While robotics are advancing the institutions and legal systems need to be advanced in order to ensure just transition

Q.4) Private participation in propelling India's space journey is widely acknowledged but is yet to be fully tapped. In light of the statement, analyse the hurdles faced by the private sector and also recommend measures to unlock greater private participation in the space economy. (10 marks, 150 words)

भारत की अंतरिक्ष यात्रा को आगे बढ़ाने में निजी भागीदारी को व्यापक रूप से स्वीकार किया गया है लेकिन अभी तक इसका पूरी तरह से दोहन नहीं किया गया है। कथन के आलोक में, निजी क्षेत्र के सामने आने वाली बाधाओं का विश्लेषण कीजिए और अंतरिक्ष अर्थव्यवस्था में अधिक निजी भागीदारी को प्राप्त करने के उपायों की भी अनुशंसा कीजिए। (10 अंक, 150 शब्द)
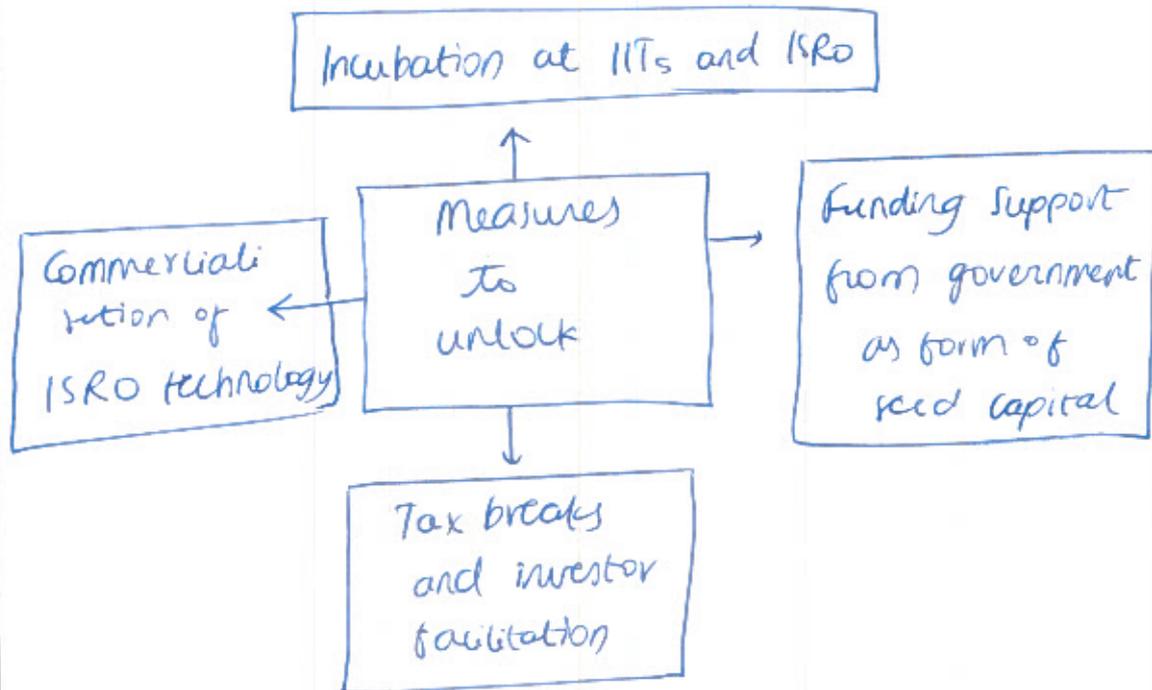
There is a boost in private participation in space sector as can be seen in success of <u>Agnikul Cosmos</u> and others

Importance of private participation
→ Ease pressure on ISRO for tasks like satellite launch
→ Private assembly of rockets
→ New applications and market Ex <u>Satellite internet</u> (Starlink)
↓
<u>Aid in R&D</u>

| Hurdles faced by private sector |

① <u>Entry barriers</u> as space is considered as a strategic sector

② <u>Limited funding</u> and <u>hand holding support</u> from domestic sources

③ Very few players in domestic market and international market dominated by SpaceX_ Boeing

④ No immediate market - very few satellite launches from Indian soil and from Indian companies

⑤ long gestation period for becoming profitable

Incubation at IITs and ISRO

Commerciali sation of ISRO technology ← Measures to unlock → Funding Support from government as form of seed capital

Tax breaks and investor facilitation

Greater private participation will move India towards a space superpower

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8

Q.5) Write an explanatory note on the causes and impacts of avalanches. Also, highlight the various strategies to mitigate its impact, with a special emphasis on NDMA guidelines. (10 marks, 150 words)

हिमस्खलन के कारणों और प्रभावों पर एक विवेचनात्मक टिप्पणी कीजिए। साथ ही, NDMA दिशानिर्देशों पर विशेष बल देते हुए इसके प्रभाव को कम करने के लिए विभिन्न रणनीतियों पर प्रकाश डालिए। (10 अंक, 150 शब्द)

Avalanches are rapid fall of snow and other debri down the hills covered with ice

Landslides

Heavy snowfall ← Causes → Infrastructure development may cause destability

Earthquakes
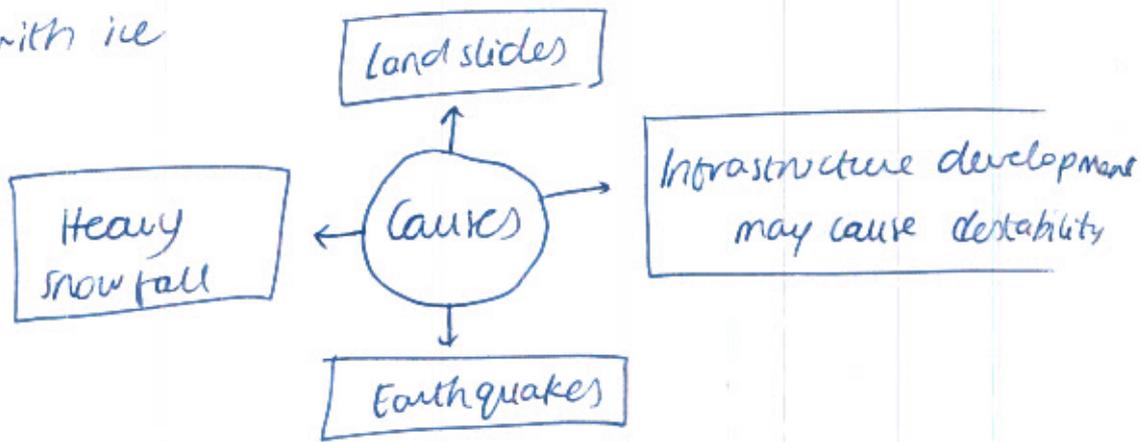
Impacts

① lon of life, property and economic loss along the path

② Infrastructure damage – like roads, power lines

③ Trigger landslides in adjacent areas

④ Disrupt economic activities and defence activities like border management

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9

Mitigation measures

NDMA guidelines

① Adopt avalanche fencing in avalanche prone areas

② Advanced notification in case of avalanche detection

③ Evacuation & Resure by NDRF and SDRF on immediate basis

Other measures

① High altitude avalanche monitoring centers need to be developed

② Capacity building & awareness generation of local community regarding avalanche

③ Avalanche resistant infrastructure to be promoted

With global warming, avalanches may rise in number and hence there is a need for better preparation.

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Q.6) Technology plays a multidimensional role in augmenting the disaster management apparatus of the country. Discuss. Also, bring out the measures needed to enhance the usage of such technologies in managing disasters.
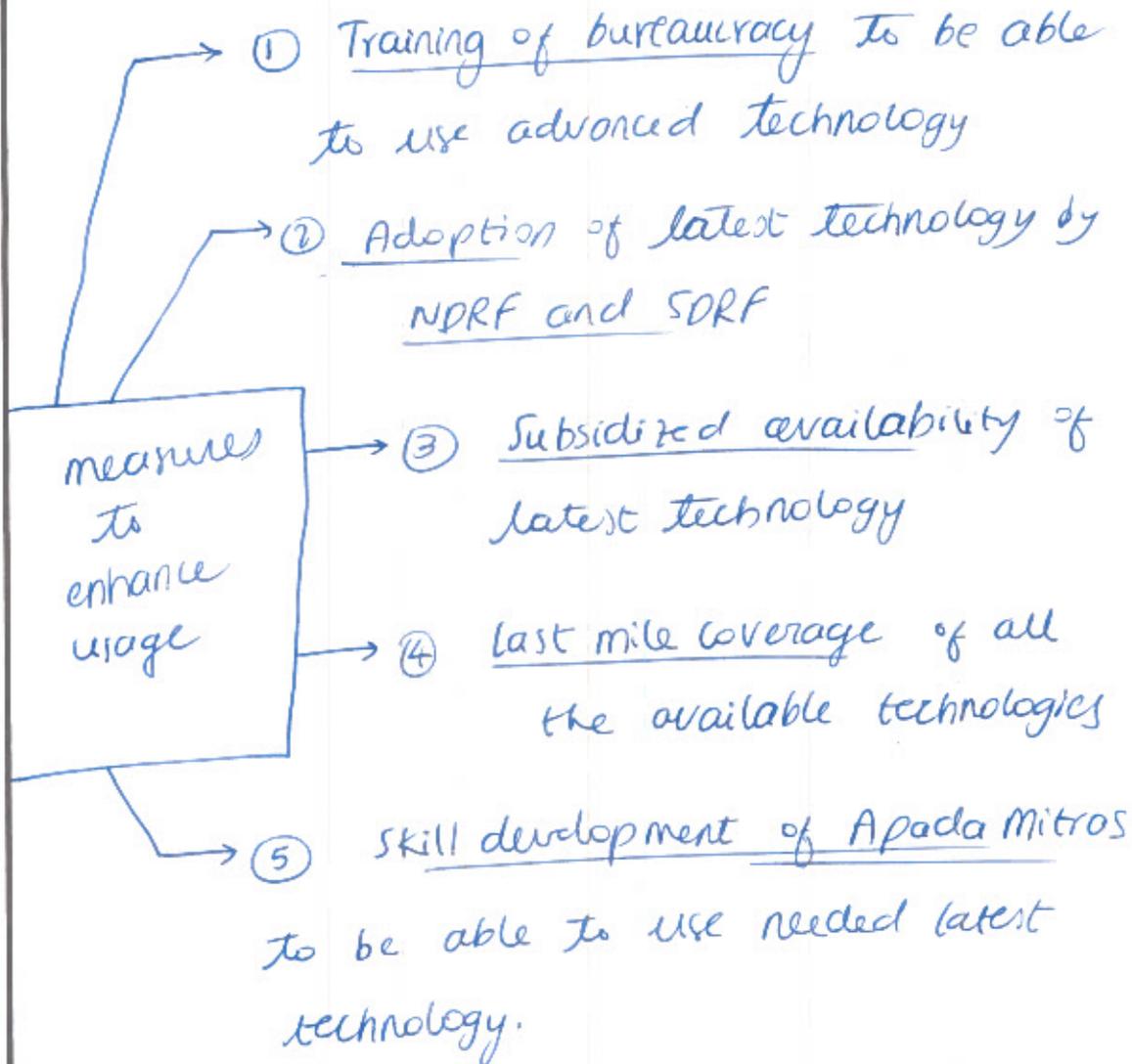(10 marks, 150 words)

देश के आपदा प्रबंधन तंत्र को बेहतर बनाने में प्रौद्योगिकी एक बहुआयामी भूमिका निभाती है। चर्चा कीजिए। साथ ही, आपदाओं के प्रबंधन में ऐसी प्रौद्योगिकियों के उपयोग को बढ़ाने के लिए आवश्यक उपाय सुझाए। (10 अंक, 150 शब्द)

Technology have multidimensional impact on entire disaster management cycle and sendai Framework had guided the enhanced use of technology in augmenting disaster management.

Multidimensional role of technology
---

① Early warning enhancement Ex Satellite images of cyclone

② Mitigation measures
   Ex Disaster resilient infrastructure

③ Communication & fast response during disasters
   Ex Social media to transmit messages
   5G for lost mile connectivity

④ Vulnerability mapping for any particular area
   Ex iFLOWS app - predict Mumbai flooding

⑤ Effective rehabilitation and resettlement

Ex: GIS and GPS can be used to identify safe places

① Training of bureaucracy to be able to use advanced technology

② Adoption of latest technology by NDRF and SDRF

measures to enhance usage

③ Subsidized availability of latest technology

④ Last mile coverage of all the available technologies

⑤ Skill development of Apada Mitros to be able to use needed latest technology.

Penetration of Technology to all stages of disaster management is necessary in order to effectively use them.

Q.7) Discuss the natural and anthropogenic factors behind incidents of land subsidence. Suggest counter-measures to contain such incidents.

(10 marks, 150 words)

भूमि अवतलन/भू धँसाव की घटनाओं के पीछे प्राकृतिक और मानवजनित कारकों पर चर्चा कीजिए। ऐसी घटनाओं को रोकने के लिए निरोधात्मक उपाय सुझाएँ।

(10 अंक, 150 शब्द)

Land Subsidence is the phenomenon where the ground underneath sinks due to various reasons causing damages to overground infrastructure

&x Land Subsidence in Joshimath.

Factors behind land Subsidence

(A) Natural factors

a) Unsustainable ground - as ground may be formed on unconsolidated sediments

b) Unstability caused due to seismic events

(B) Anthropogenic factors

a) Ground water extraction beyond limit

b) Underground mining extensively may also cause subsidence

c) Rapid infrastructure building on ustable

ground

d) Human induced unstability – constructing roads

Counter measures needed

① Vulnerability mapping of land subsidence prone areas – can use historical satellite data

② Stabilization measures

a) Injecting ground water

b) structural stability via cement structures

③ Reduce infrastructure development in and around the suspected area

④ landslide walls to prevent any large scale landslides.

Coupling R&D and institutional measures in dealing subsidence is needed to effectively deal with the problem.

**Q.8)** Explain Glacial Lake Outburst Flood (GLOF). Also, discuss GLOF mitigation strategy with special reference to National Disaster Management Authority (NDMA) guidelines.   (10 marks, 150 words)

ग्लेशियल लेक आउटबर्स्ट फ्लड (GLOF) का वर्णन कीजिए। साथ ही, राष्ट्रीय आपदा प्रबंधन प्राधिकरण (NDMA) के दिशा-निर्देशों के विशेष संदर्भ में GLOF शमन रणनीति पर चर्चा कीजिए।   (10 अंक, 150 शब्द)

Glacial lake outburst flood (GLOF) is a phenomenon in which _glacial dammed by terminal moraines is breached by lake water_ causing instant flash flood.
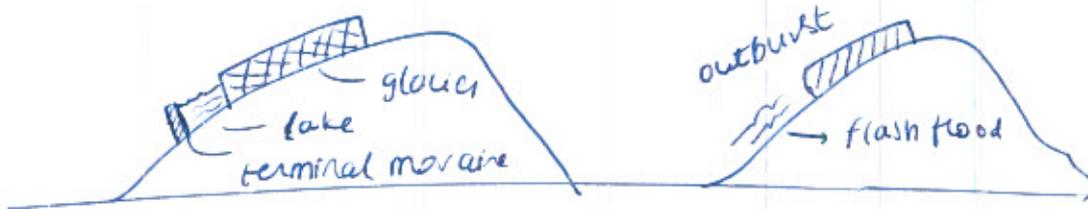
GLOF phenomenon

As glaciers retreat, due to natural causes and global warming, pressure on moraines increases and they break causing GLOF

Mitigation strategies

(A) NDMA guidelines

(1) Monitoring of glacial lakes via satellite

(v) Early warning in case of GLOF

(3) Collecting real time data on Glacial lakes

Other measures

(1) Reducing green house gas emissions and brown carbon emissions which are causing rapid glacial retreat

(2) Stabilizing moraines artificially

(3) Diverting glacial lake water in case of rapid expansion of glacial lake Ex Artificial Stupa in Ladakh

Using radars and real time satellite monitoring is key to face GLOF effectively.

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16

Q.9) National security challenges require sufficiently addressing the concerns of human security. Explain and suggest reforms for the same. (10 marks, 150 words)

राष्ट्रीय सुरक्षा की चुनौतियों का प्रभावी समाधान मानव सुरक्षा की चिंताओं को पर्याप्त रूप से संबोधित किए बिना संभव नहीं है। इस विषय पर विस्तारपूर्वक चर्चा करें और इसके लिए सुधारात्मक उपायों का सुझाव दीजिए। (10 अंक, 150 शब्द)

Human security is ensuring security of an individual and protecting from all the external threats. It is an important component of national security.

→ National Security
→ Human security
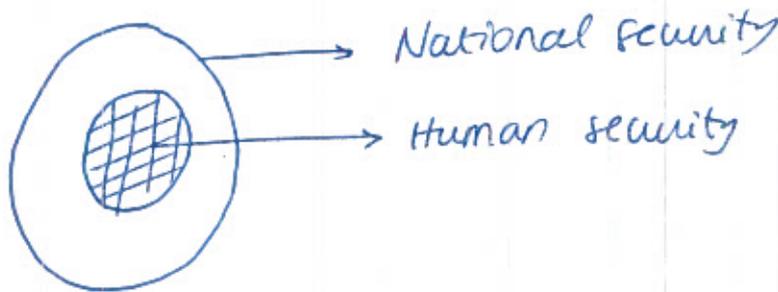
| Addressing concerns of human security |

① Protecting from external agressions - war, terror attacks

② Threats from internal domain - theft, crimes etc

③ Individual cyber security - is component of larger cyber security landscape

④ Non traditional threats elimination
    Ex: Bio terrorism (Anthrax)

Reforms needed

① Police transformation

- from "Rulers police to peoples police"

- Capacity building - advanced technology, ethical training

- Filling of vacancies

② Institutional changes

- Reforming IB, CBI for enhancing intelligence and effective investigation

- Enhancing cyber security capability

③ Domestic R&D on advanced technology like quantum computing.

Keeping individual centre of national security framework can boost the outcomes of our approach.

Q.10) Outlining the various cyber threats faced by India, assess the state of the country's preparedness to deal with the same.
(10 marks, 150 words)

भारत को प्रभावित करने वाले विभिन्न साइबर खतरों का विस्तृत विश्लेषण करते हुए, देश की इन खतरों से निपटने की क्षमता का आकलन कीजिए।
(10 अंक, 150 शब्द)

cybersecurity is the emerging domain of warfare and crime for any nation.

| Cyber threats faced by India |

① Attacks on critical infrastructure

Ex Kudankulam powerplant - cyber attack

② Cyber Terrorism - attack on sensitive cyber data of army

③ Financial frauds using cyber domain is harming economic integrity of nation.

④ Personal & sensitive data stolen and being sold on darknet Ex tomato data leak

⑤ Spamming, spoofing, coordinated attacks - denial of services

| Country's preparedness |

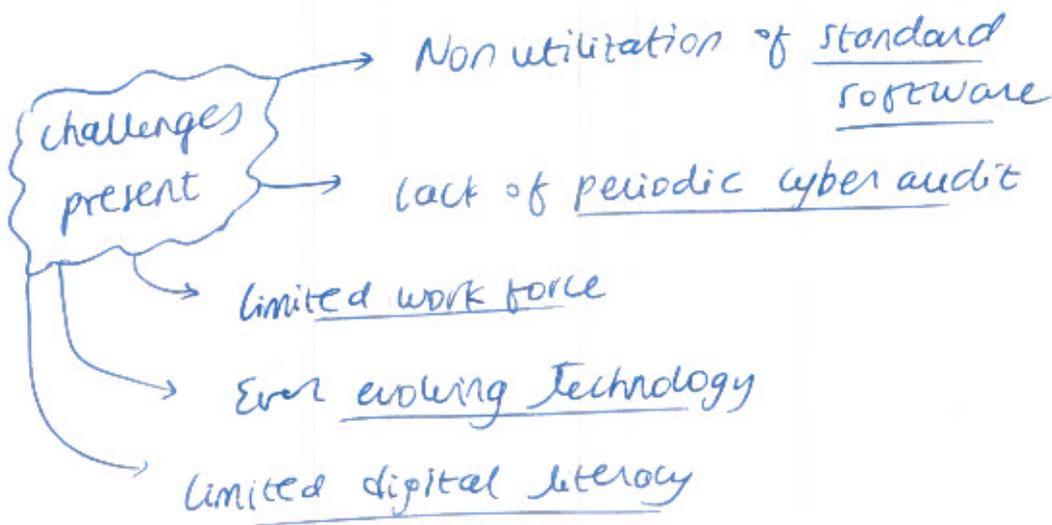① National Cyber Security policy - guiding document

② National Cyber Security Strategy

③ Institutional structures

   a) CERT-In — Computer Emergency Response team

   b) NCIIPC — National Critical Information Infrastructure protection centre

   c) I4C — Indian Cyber Crime coordination centre

④ Apps and programs

   - m-Kavach app
   - Cyber Swachatta Kendra

{ Challenges present } → Non utilization of standard software

→ Lack of periodic cyber audit

→ Limited work force

→ Ever evolving Technology

→ Limited digital literacy

There is a need To enhance digital literacy & cyber hygiene along with boost in cyber security spending To mitigate the challenges

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Q.11) Explain how the geographical location of India makes it extremely vulnerable to the menace of drug trafficking. What are the various internal security threats posed by drug trafficking? (15 marks, 250 words

भारत की भौगोलिक स्थिति इसे किस प्रकार ड्रग तस्करी के लिए एक अत्यंत संवेदनशील क्षेत्र बनाती है? ड्रग तस्करी के कारण उत्पन्न होने वाले आंतरिक सुरक्षा के विभिन्न खतरों का विस्तारपूर्वक विश्लेषण कीजिए। (15 अंक, 250 शब्द)

Drug trafficking is a menace that not only causes law and order problem but also endangers many lives by means of addiction

$\boxed{\text{Geographic location} - \text{vulnerability}}$

① India is a sandwitched between golden triangle and golden crescent

② Manipur becoming extended golden triangle

a) Cultivation of drugs

b) Moreh in Manipur is acting as smuggling centre

③ Jammu & Kashmir and Punjab are becoming hubs of trafficking

⊙ Moreh

△ - Golden triangle
Myanmar - Thailand
- Cambodia

☁ - Golden crescent
Afghanistan - Iran - Pakistan
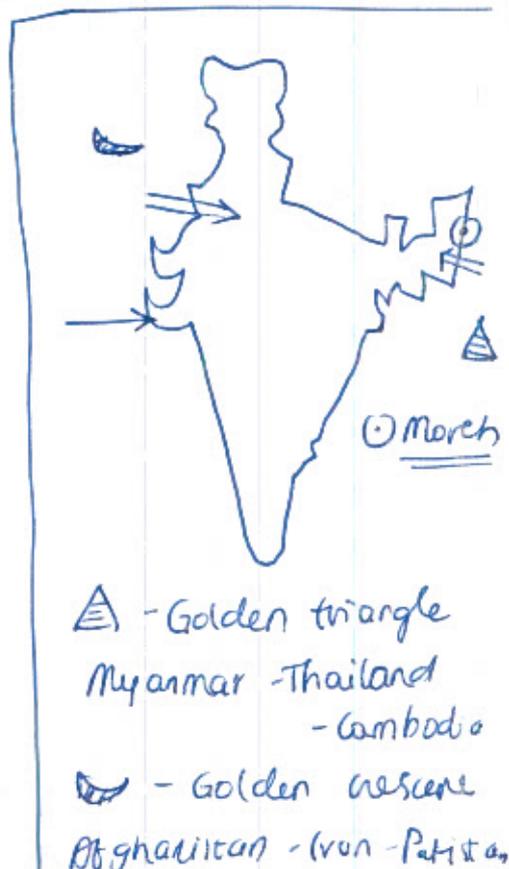
because of illegal export and use of technology like UAVs for transporting drugs

④ Coastal vulnerability - India's West coast had become more vulnerable to drug smuggling
 - Import from Iran
 - Recent seizure of drugs in Mundra port

Internal security threats

① Conducive channel for organised crime groups as drugs act as medium of exchange for arms and ammunation

② Funding and money laundering - drug trafficking is a source of money laundering for terrorists

③ Illegal activities like stone pelting are being funded by drugs revenue

(4) law and Order issues due to the persons creating ruckus on roads and other public places

(5) Increase in crime rates with increase in drug consumption

→ NDPS act

Government measures

→ NCB - Narcotics Crime Bureau

→ Nasha Mukt Bharat plan

→ eSIMS - Seizure Information Management system

→ Operation Samudragupta - to seize Ships transporting drugs
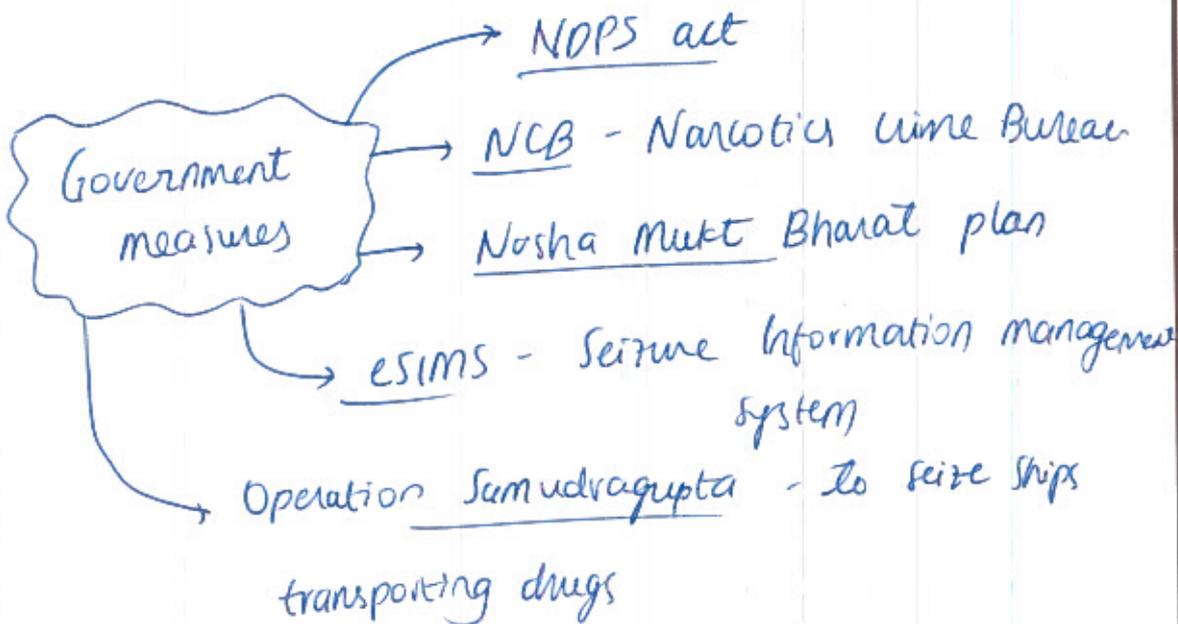
Comprehensive and Coordinated action among government, civil society and youth is required to remove drug menace.

Q.12) Discuss the socio-economic impact of new developments in science and technology in India since independence.

(15 marks, 250 words)

स्वतंत्रता के पश्चात् भारत में विज्ञान एवं प्रौद्योगिकी के नवीन विकासों के सामाजिक और आर्थिक प्रभावों का वर्णन कीजिए।

(15 अंक, 250 शब्द)

Technology has been a driver of development for India since independence.

India had been promoting science and technology from independence as can be seen in establishing <u>IITs, ISRO, BARC</u> etc.

Socio economic impact

① <u>Biotechnology</u>

a) Advancements in seeds and fertilizers - <u>High</u> yielding varieties development by <u>MS Swaminathan</u> had led to <u>Green revolution</u>

   - Ensured food security & <u>reduce poverty</u>

   - <u>Increase income for farmers</u>

b) <u>Pharma sector development</u> - India became one of largest manufactures of vaccines and medicines

- Accessibility to health enhanced
- Elimination of various diseases Ex Polio

② Telecommunication

- Revolution in telecommunication had led to creation of numerous jobs

- Paved way for service sector rise in India

- eGovernance development - had helped ease of living & last mile delivery of services
  Ex JAM (JanDhan Aadhar Mobile)

③ Industrial technology

- Development of heavy industry and self-reliance in capital goods

- Power security - development of large hydro power plants and Thermal plants

- Access to electricity had reduced poverty and paved way for new industries

(5) <u>Space technology</u>

- India today is one of <u>pioneer</u> in space technology

- Contributed to <u>disaster management</u>

- <u>Remote sensing</u> - had contributed to agriculture

- <u>Communication development</u> - NaVIC

- Boost to <u>domestic industry</u> and ease of living

(6) <u>Infrastructure</u>

- <u>Building mega dams</u> - enhanced irrigation and
  thus boost to livelihoods

- Highspeed trains, expressways - contributed
  to business development and thus enhanced GDP

Today there is a need to enhance
spending on R&D from 0.6-0.7% GPP to
around 2.5% GPP which can further drive the
nations growth towards Viksit Bharat

Q.13) 5G technology is a breakthrough that finds applications across diverse sectors. Elaborate. How is 5G technology different from its predecessor? Also, list the various challenges associated with its effective rollout.
(15 marks, 250 words)

5G प्रौद्योगिकी एक अभिनव तकनीक है जिसके अनुप्रयोग विभिन्न क्षेत्रों में पाए जाते हैं। विस्तारपूर्वक बताएँ। 5G प्रौद्योगिकी अपने पूर्ववर्ती से किस प्रकार भिन्न है? साथ ही, इसके प्रभावी कार्यान्वयन से जुड़ी विभिन्न चुनौतियों को सूचीबद्ध कीजिए।
(15 अंक, 250 शब्द)

5G is the new generation of communication Technology that has high bandwith and lower latency compared to 4G

The homecoming of 5G is now finding applications in various sectors

Applications

① Real time communication will be made possible and this have application in Health & Disaster management

by Doctor performing Robotic surgery from far away.

② Industrial application - 5G can act as blanket network than can communicate with all sensors

— Bring down time & enhance resilience

(3) **IoT application** - 5G can pave to IoT (Internet of Things) into daily lives and homes

(4) **AR and VR** - Artificial & Virtual reality can be much more _immersive_ and reachable due to _low latency nature_

(5) Governance - 5G can aid in improving eGovernance services in hinterlands and faraway areas.

Different from 4G

4G	5G
① Speed around 10mbps	① Speeds can reach around 1GBPS
② latency around 100ms	② latency around 10ms
③ Coverage is less per tower	③ High coverage under single tower
④ low bandwidth.	④ High frequency bandwidth

Challenges associated

1. High capital investment from private companies had now led to increase in prices

2. Unreliability due to lack of coverage

   Ex Switching from 5G to 4G

3. Availability in rural and tribal areas is limited

4. Cyber security fears as Chinese equipment can come with embedded softwares

5. High frequency waves can cause health impacts in long run.

   IEEE and WHO had certified that 5G is not harmful but advancement from 5G to 6G is necessary for making India a global leader in telecommunication.

Q.14) Discuss the repercussions on marine ecosystem and economy resulting from the combined effects of ocean acidification, ocean warming, and oxygen loss. (15 marks, 250 words)

महासागरीय अम्लीकरण, तापन तथा ऑक्सीजन ह्रास के संयुक्त प्रभावों से समुद्री पारितंत्र एवं अर्थव्यवस्था पर पड़ने वाले परिणामों की विवेचना कीजिए। (15 अंक, 250 शब्द)

The accelerated nature of climate change and global warming had led to alarming levels of ocean acidification, warming and oxygen loss

$$H_2O + CO_2 \rightarrow H_2CO_3$$
$$H_2CO_3 \rightarrow H^+ + HCO_3$$
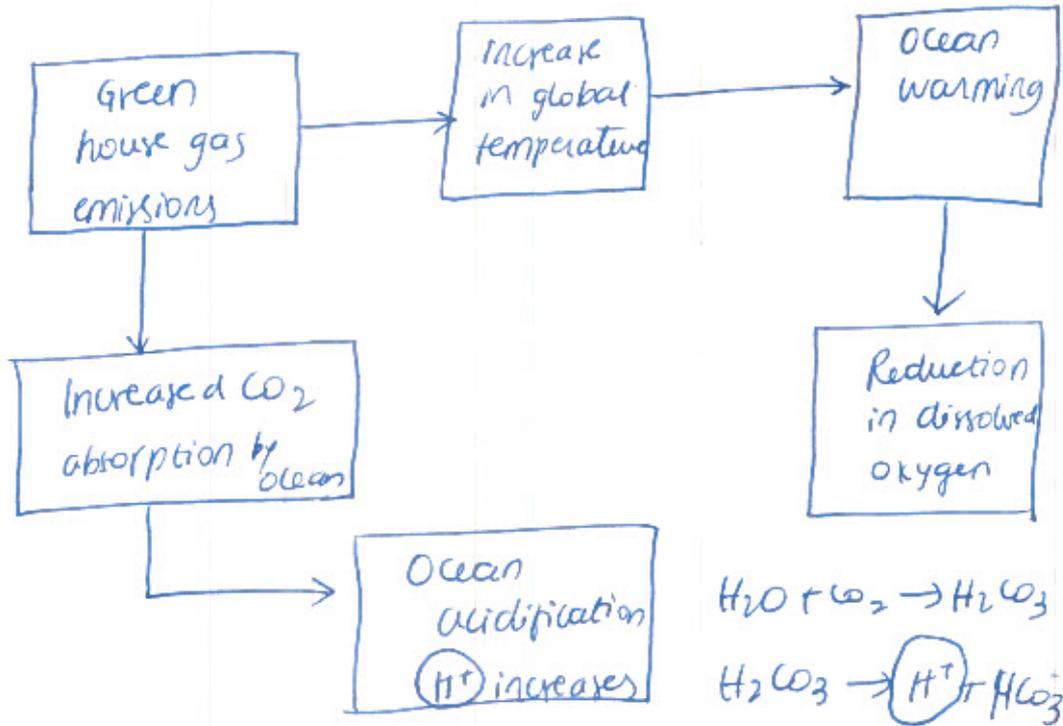
This phenomenon will impact marine ecosystem and the economy that is dependent on them.

Repercussions on marine ecosystem

① Coral bleaching and mass death due to rise in temperature

- Rainforests of oceans death will enhance extinction rates

② Ocean currents pattern change, which may impact migration patterns

Ex Instability in Atlantic meridonian ocean circulation (AMOC)

③ Benthic ecosystems become unstable due to rise in acidification and warm water influx

④ Phytoplankton ecosystem and sea grasses will be not able to survive heat

⑤ Increasing frequency of Marine Heat waves

Ex Recently in California Coast

Blue economy repercussions

① Fishing will be impacted as the number

of fish will be reduced

② Tourism decline as death of corals can uninterest tourists

③ Decay of Coastal ecosystems like mangroves will impact the people dependent on them

④ Coastal aqua culture and sea weed cultivation will be facing losses Ex Gulf of Mannar region.

Measures needed
→ 30×30 target - securing 30% ocean ecosystem by 2030

→ Reducing green house gas (GHGs) emission by enhancing NDCs (Nationally determined contribution)

→ Rehabilitation of corals Ex Biorock Technology
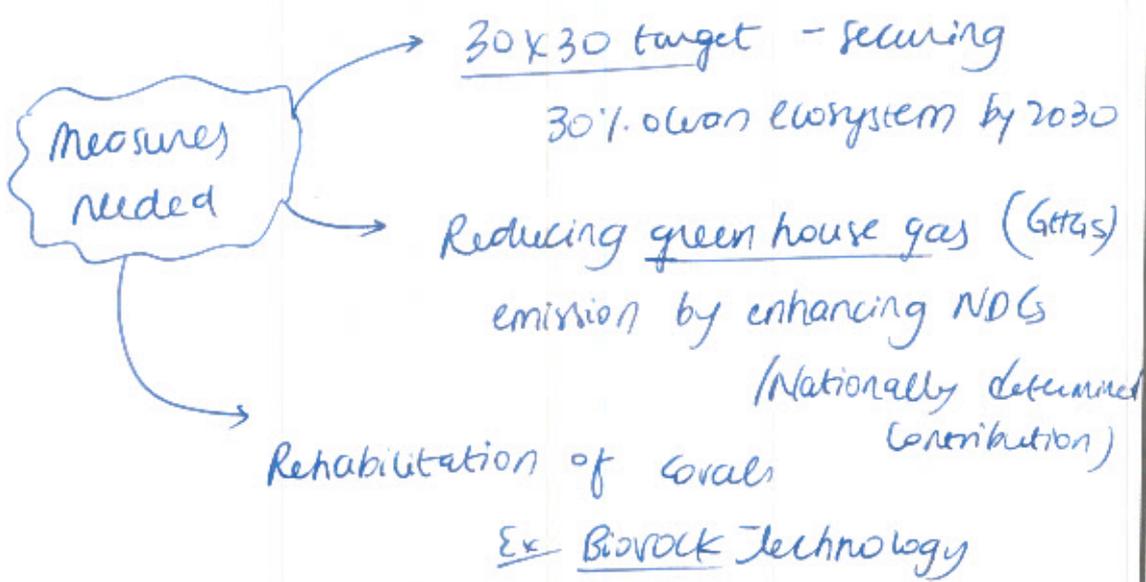
Marine ecosystems are sensitive and hence any small changes can have exponential impact.

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Q.15) The invisible nature of groundwater is a major obstacle in the path towards achieving the twin objectives of building climate resilience and meeting the Sustainable Development Goals (SDGs). Elucidate.
(15 marks, 250 words)

भूमिगत जल की अदृश्यता जलवायु अनुकूलन एवं सतत् विकास लक्ष्यों (SDG) को पूरा करने के दोहरे उद्देश्यों को प्राप्त करने की दिशा में एक प्रमुख चुनौती है। विस्तारपूर्वक वर्णन कीजिए।
(15 अंक, 250 शब्द)

India is the largest user of ground water in the world with ~25% of global extraction

⎡ Invisible nature ⎤

(A) Obstacle towards climate resilience

a) Agriculture uses 97% of groundwater in India — Tube wells. Higher dependency on ever declining groundwater will not be making crops resilient in future

b) Supply demand mismatch

 — ever increasing demand for groundwater and limited supply

 — over dependence will hamper humans endeavour to look for other sources and hence not become resilient

(B) Obstacle towards sustainable development

a) Using ground water without evaluating the decline — leading to unsustainable usage

b) Interconnected nature of groundwater - exhaustion of ground water in one region may lead to chain reaction of exhaustion in other area.

Rainwater harvesting to recharge groundwater Ex Bunglwroo Model

measures needed → Integrated watershed development

→ Curb Tube well expansion

Sustainable agriculture practices

Ex Direct seeding of rice inplace flood irrigation
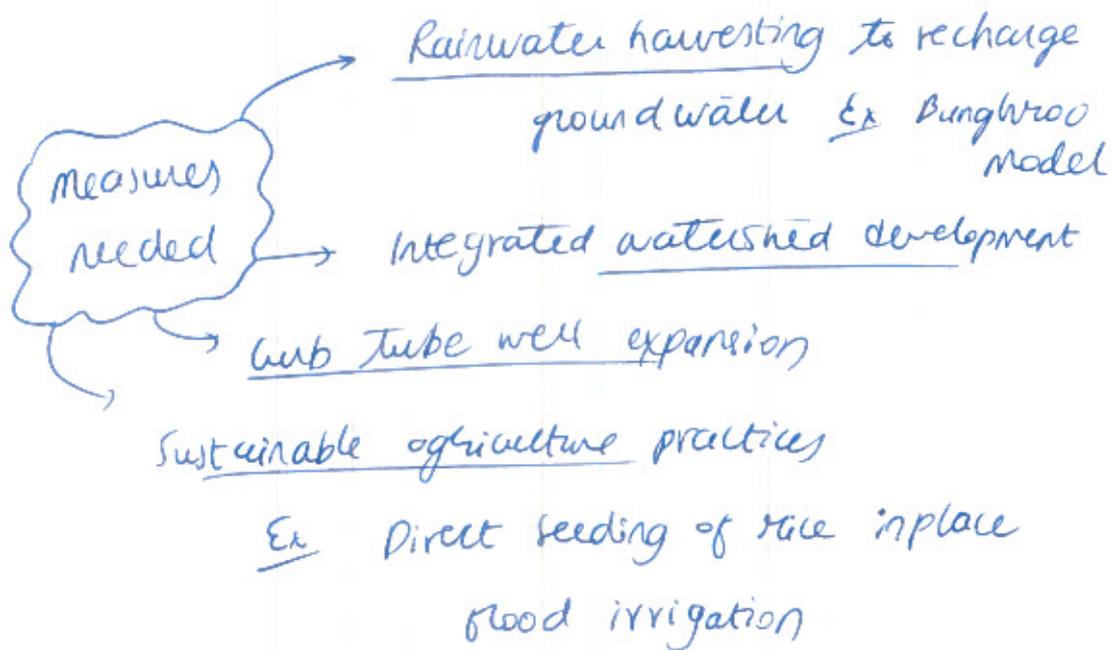
Sustainablity of ground water is crucial for a sustainable future

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Q.16) Describe the concept of loss and damage and evaluate its relevance in ensuring climate equity.
(15 marks, 250 words)

हानि और क्षति (Loss and Damage) की अवधारणा का वर्णन कीजिए तथा जलवायु समानता सुनिश्चित करने में इसकी प्रासंगिकता का मूल्यांकन कीजिए।
(15 अंक, 250 शब्द)

Loss and Damage is the concept that had been in discussion from long time but recently materialized by establishing loss and Damage fund in COP28.

Loss and Damage

Historically high GHG emitters and polluters → High damage compared to LDCs → Developed countries continue to L&P fund

Fund used to mitigate loss & damages in vulnerable nations ←
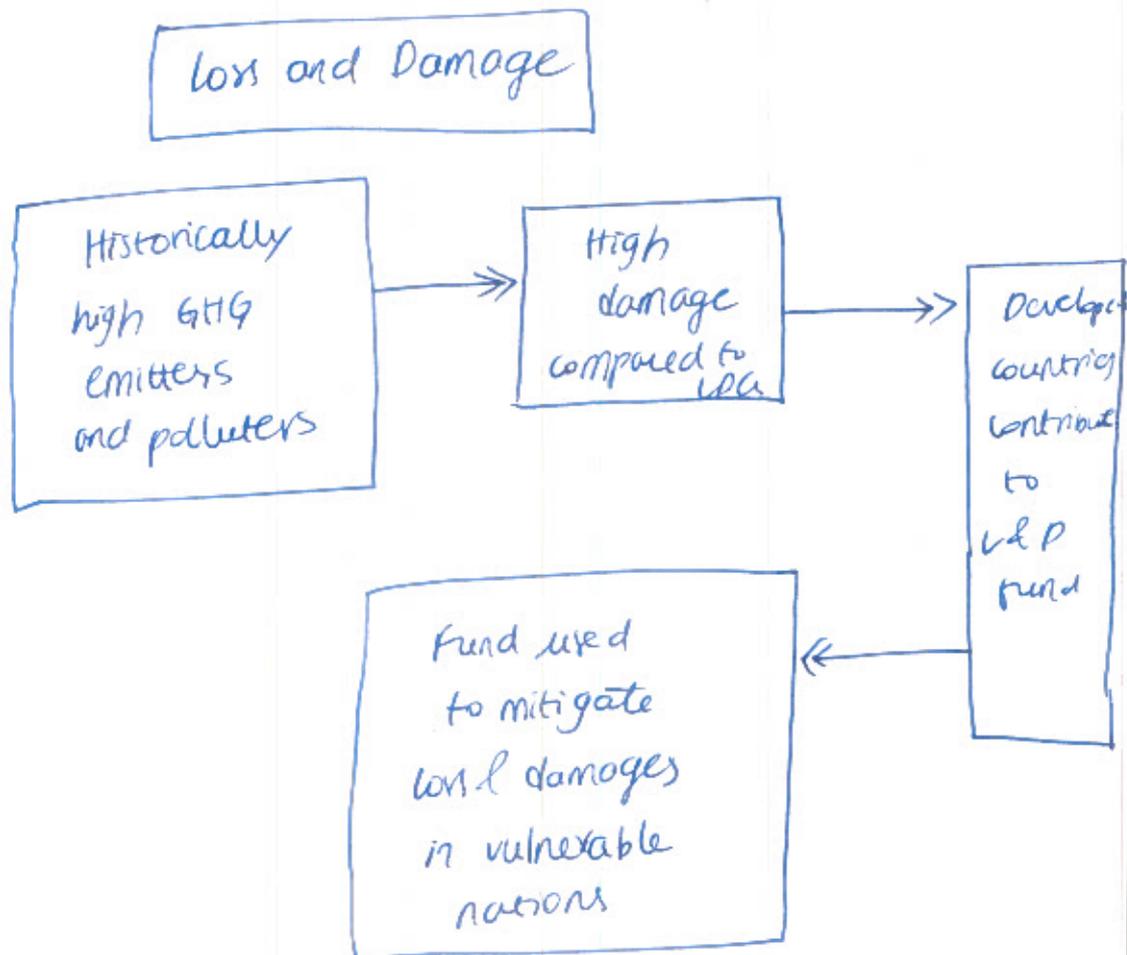
Relevance

① Climate justice by way of penalising the historical polluters

② Climate mitigation in least developed and small island states

③ Equity principle and adherence to CBDR-RC (Common but differentiated responsibilities-respective capabilities)

④ Balanced approach that balanced the need of LDCs and developed world

Challenges present

① Limited funding from Western nations

② LLP fund no match to the commitment of $100bn per year by 2020 by

developed world.

③ Equitable distribution of L&D funds among all vulnerable nations.

④ Governance of L&D fund by World Bank which is controlled by the west.

Despite these challenges L&D is step in right direction, but commitments towards L&D must be enhanced along time to ensure true climate equity.

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Q.17) What role does wetland play in expanding the framework of sustainable development? What are the challenges faced by wetland ecosystem? Discuss the corrective steps required for their effective conservation. (15 marks, 250 words)

आर्द्रभूमि धारणीय विकास के ढांचे को विस्तारित करने में किस प्रकार योगदान देती है? आर्द्रभूमि पारितंत्र किन चुनौतियों का सामना कर रहा है? इनके प्रभावी संरक्षण हेतु आवश्यक उपायों का वर्णन कीजिए। (15 अंक, 250 शब्द)

Wetland ecosystems are ecotone systems that play a major role in ensuring stability of biosphere

┌───┐
│ Role of wetland in sustainable development │
└───┘

① Ecosystem Conservation by way of protecting vulnerable fish and Tree species

② Sustainable resource usage

    Ex: Ground water recharge
        water purification

③ Moderating impacting of global warming

    Ex: Reduction in temperatures around wetland

④ Resilience of ecosystem and surrounding is enhanced

    Ex Mitigating floods

(5) Carbon sequestration – directly and indirectly by supporting trees around.

> Challenges faced by wetlands

(1) Encroachment due to rise in urbanisation and population explosion

      Ex Bengalore losing lakes for realestate

(2) sewage dumping and industrial effluents dumping into wetlands

      Ex Ulsoor lake frothing

      Thermal pollution –dumping hot water

→ Eutrophication – from agriculture runoff

(3) Unsustainable water pumping out of wetland had led to decrease in water level

(4) Blocking of channels that flow into the wetland

(5) Invasive alien Species (IAS) in and around wetlands Ex African catfish

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| Corrective steps |

① Data Collection on the number of wetlands and states. This will be 1st step towards any conservation efforts

    Ex: Wetland Census 2023

② Constructing artificial wetlands than can act as natural habitat

③ Removing illegal encroachments and rehabilitating channels that flow into wetland

④ Sewage treatment plants and effluent treatment plants to be Constructed

    Amrit Darohar Scheme can be a step towards making wetlands resilient and centre of our approach Towards SDGs.

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Q.18) Despite various efforts, a lasting solution to the insurgency in the north-eastern region of India remains elusive. Analyse the reasons behind the continuation of insurgency in the region. Also, suggest effective measures to tackle it.

(15 marks, 250 words)

विभिन्न प्रयासों के बावजूद, भारत के उत्तर-पूर्वी क्षेत्र में विद्रोह का स्थायी समाधान अभी तक नहीं मिल पाया है। इस क्षेत्र में विद्रोह जारी रहने के कारणों का विश्लेषण कीजिए। साथ ही, इसे निपटने के लिए प्रभावी उपायों को सुझाएँ।

(15 अंक, 250 शब्द)

The insurgency in the Northeast region had reduced when compared to 2-3 decades ago due to various efforts like

```
Various
efforts
```
→ Agreements with insurgents

  Ex Bodo accord
      Naga accord
      Bru-Reang agreement

→ AFSPA — special powers to forces

→ Development of North East
      Ex PM DeVINE scheme

→ Enhancing Connectivity
   Ex Transit agreement via Bangladesh
       Maitri Setu — Tripura — Bangladesh

→ Security related expenditure scheme

→ Special category status

→ Enhanced autonomy   (Autonomous councils)

Even after such wideranging efforts there is continuation of insurgency

Ex : Manipur violence
ULFA attacks

| Reasons behind Continuation of insurgency |

① Ethnic clevages - various ethnic clashes among tribals had led to insurgency Ex Manipur
(Maitei - Kuki clash)

② External Support - in terms of arms & finances had kept the movement alive

③ Proximity to golden triangle - organised crime groups joined hands with insurgents

④ Non comprehensive accords - various accords that government had signed had accepted by one faction but not other

Ex NSCN (K) had not accepted Naga accord

(5) Illegal migration that pose challenge to local demography, culture

- The increase in migration acting as catalyst to insurgents.

┌─────────────────────────┐
│ Measures to tackle it   │
└─────────────────────────┘

① Effective Surrender and Rehabilitative policy to pursue armed militants to surrender

② Comprehensive border management to curb illegal migration, arms and financial support

③ Hot pursuit attacks - to clean hide outs across the border

④ On ground intelligence enhancement

⑤ Boost connectivity especially rail and waterways

Government efforts need to ensure that the message of "Ballot is the solution, Bullet is not" must be resonated

Q.19) While developmental initiatives have a significant role to play, they alone cannot root out terrorism/ militancy in Jammu and Kashmir. Comment. (15 marks, 250 words

जम्मू-कश्मीर में आतंकवाद/उग्रवाद के उन्मूलन के लिए विकासात्मक पहलें महत्वपूर्ण हैं, परंतु ये अकेले पर्याप्त नहीं हैं। टिप्पणी कीजिए। (15 अंक, 250 शब्द)

The terrorism in Jammu & Kashmir is being dealt with two pronged approach

→ Development
→ Hard power (Army)

| Significant role of developmental initiatives |

① Reduce anti-national feelings and thus less chance of radicalitation

```
┌──────────────┐      ┌──────────────┐
│ Development  │ ───→ │ Enhance      │
└──────────────┘      │ living       │
                      └──────────────┘
                              │
                              ▼
┌──────────────┐      ┌──────────────┐
│ Reduce       │ ⇐─── │ Less sope    │
│ terrorism in │      │ for          │
│ long run     │      │ radicalisation│
└──────────────┘      └──────────────┘
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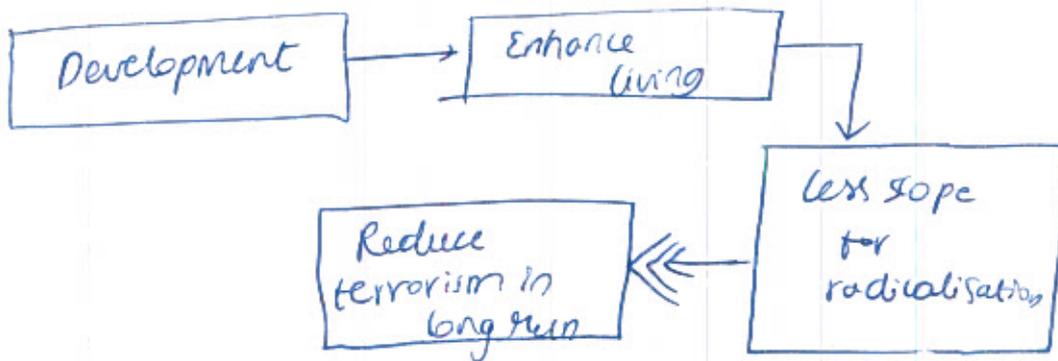
② Productive life channels can be boosted by building human capital

Ex Skill development → Employment and less terrorism

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③ <u>Economic development</u> will eliminate poverty and hence terrorism

"Poverty is breeding ground of radicalism"

Ex Industrial development
promoting entrepreneurship

④ <u>Correcting injustices</u> that had happened historically

Ex Development of border villages
Vibrant Village development scheme

However, developmental initiative have certain | challenges |

① Inclusion and exclusion errors had led to some sections being left vulnerable

② Overground workers - despite having development they support Terror groups.

③ External support in mobilising support to terror groups   Ex Stone pelting on army

④ long term nature of developmental initiatives.
They can give returns only in long run

⑤ Current injustices like misuse of power by
police, custodian torture etc are driving
anti-national narratives despite developmental
activities-

Comprehensive border security to
reduce infiltration

Monitoring social media to
combat radicalization, fake news
Ex Cyberdome, Kerala

Hard actions like surgical strikes

```
Way
ahead
```

Destroying hideouts and intelligence
over over ground support

Restoring statehood and conducting
periodic elections

Eradicating militancy is longprous
that require balance of development & Hardpower

Q.20) What do you understand by theaterisation of commands? Enumerating the impediments in theaterisation for India's armed forces, discuss the role of Chief of Defence Staff in enhancing the effectiveness of India's external security response. (15 marks, 250 words)

कमांड के थियेटराइज़ेशन से आप क्या समझते हैं? भारत के सशस्त्र बलों के लिए थियेटराइज़ेशन में बाधाओं का वर्णन करते हुए, भारत की बाह्य सुरक्षा प्रतिक्रिया की प्रभावशीलता को बढ़ाने में चीफ ऑफ डिफेंस स्टाफ की भूमिका पर चर्चा कीजिए। (15 अंक, 250 शब्द)

Theaterisation is the idea in which all the 3wings of the armed forces combat together under single command

Western Theater (Pakistan border)

Air command theatre

5 theaters proposed

Eastern theater

Peninsular theater

coastal theatre

Theaterisation → Single commander

→ Integration of logistics and procurement

Joint working
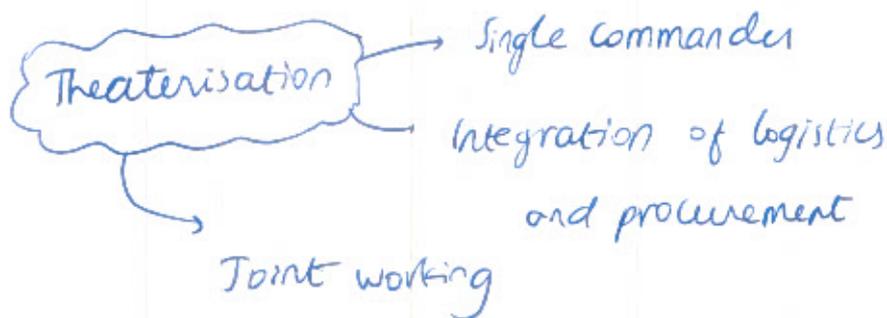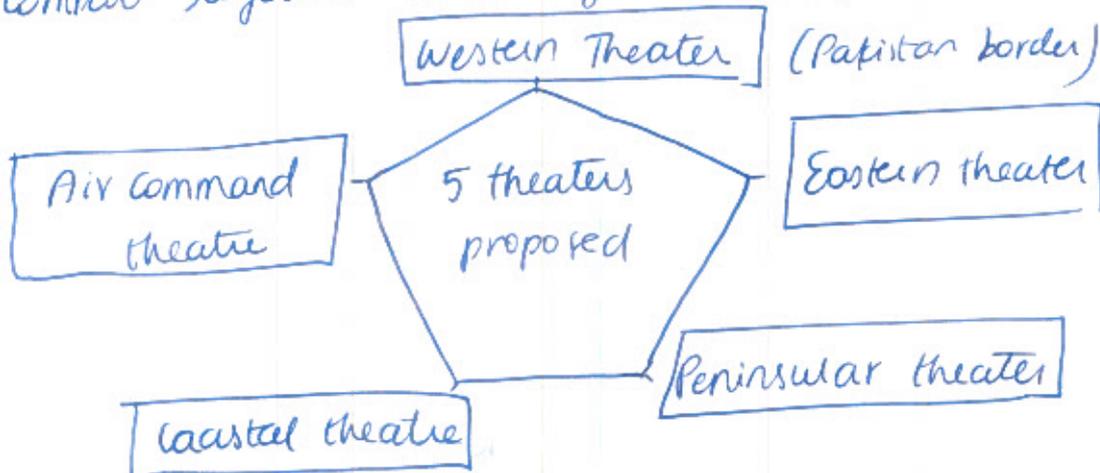
Impediments to theaterisation

① Perception of domination of army - as it may have command of theatre and

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in this Area / इस स्थान
पर कुछ न लिखें)

Command over logistics and procurement

② limited experience for India

&. Only Andaman have joint tri-service Command

③ Compatability among Various groups of armed forces need to be seen

④ Funding issues for enhanced procurement requirements for armed forces

In order to tackle these challenges Chief of Defence staff (CDS) comminioning is seen as major step.

> [CDS ⟶ enhancing effectiveness]

① Foster decision making as CDS is head of chief of armed forces

② Quality procurement as CDS is member of defence acquistion council

③ framing national security doctrine and implementing it

④ Integrated vision for nation's armed forces.

New institution

Challenges regarding CDS → Enhancing cooperation among 3 forces

→ Limited capital expenditure

→ Boosting defence budget is limited due to fiscal deficit constraints
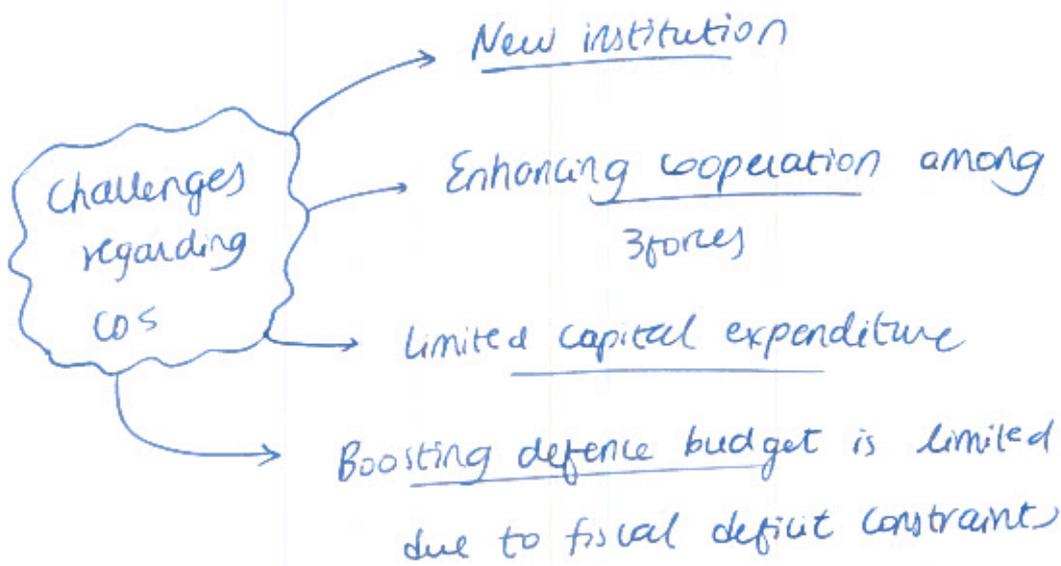
CDS as an institution is needed as it is followed in many other nations. But India must tweak the institution to suit its need and boost our defence capabilities.

ForumIAS

Mentor Feedback Questions

1 ....

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3 ....

4 ....

5 ....

Test Goal

1 .... ☐
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2 .... ☐
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3 .... ☐
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Outcomes

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Marking Scheme

Mark	Good	Average	Below average
10 Marker	3.75 – 5.0	3.0 – 3.5	< 3.0
15 Marker	5.75 – 7.0	4.0 – 5.5	< 4.0
20 Marker	7.75 – 10	6 – 7.5	< 6
✔✔	Key / Relevant Point		
✖	Vague / Irrelevant		

* Subject to change without prior notice.

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