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GENERAL STUDIES (TEST CODE : 2091)

Name of Candidate	Samir Khode		
Medium Eng./Hindi	English	Registration Number	1531081
Center	online	Date	

INDEX TABLE			INSTRUCTIONS	
Q. No.	Maximum Marks	Marks Obtained	1. Do furnish the appropriate details in the answer sheet (viz. Name, Registration Number and Test Code). उत्तर पुस्तिका में सूचनाएं भरना आवश्यक है (नाम, प्रश्न-पत्र कोड, विद्यार्थी क्रमांक आदि)। 2. There are TWENTY questions printed in HINDI & ENGLISH. इसमें बीस प्रश्न हैं हिन्दी और अंग्रेजी में छपे हैं। 3. All questions are compulsory. सभी प्रश्न अनिवार्य हैं। 4. The number of marks carried by a question/part is indicated against it. प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं। 5. Answers must be written in the medium authorized in the Admission Certificate, which must be stated clearly on the cover of this Question-Cum-Answer (QCA) Booklet in the space provided. No marks will be given for answers written in medium other than the authorized one. प्रश्नों के उत्तर उसी माध्यम में लिखे जाने चाहिए जिसका उल्लेख आपके प्रवेश पत्र में किया गया है और उस माध्यम का स्पष्ट उल्लेख प्रश्न-सह-उत्तर (क्यूसीए) पुस्तिका के मुख्य पृष्ठ पर अंकित निर्दिष्ट स्थान पर किया जाना चाहिए। उल्लिखित माध्यम के अतिरिक्त अन्य किसी माध्यम में लिए गए उत्तर पर कोई अंक नहीं मिलेंगे। 6. Word limit in questions, if specified, should be adhered to. प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए। 7. Any page or portion of the page left blank in the Question-Cum-Answer Booklet must be clearly struck off. उत्तर पुस्तिका में खाली छोड़ा हुआ पृष्ठ या उसके अंश को स्पष्ट रूप से काटा जाना चाहिए।	
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Total Marks Obtained:				
Remarks:				
			Is student recommended for One-to-One mentoring?	
			Recommended	Strongly Recommended

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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.

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5.

6.

All the Best

1. भारतीय कृषि में जल के अकुशल उपयोग के लिए उत्तरदायी कारण क्या हैं? जल उपयोग दक्षता में सुधार के उपाय सुझाइए। (150 शब्दों में उत्तर दीजिए) 10

What are the reasons behind the inefficient use of water in Indian agriculture? Suggest measures to improve water use efficiency. (Answer in 150 words) 10

Indian agriculture consumes 89% of groundwater and similar amount of surface water as well. (ICWRB)

Reasons behind inefficient use

- ① Low irrigation efficiency
- ② Groundwater and surface irrigation efficiency is 30-50% only with

Probable cause → Run off on field.
→ evapotranspiration losses
→ more pumping than required
→ old pipes / leakage

- ② Factors aiding inefficient use
- Free power by certain states
- High MRP for water guzzler crops — Rice, sugarcane etc.
- Lack of knowledge dissemination regarding water use by KVK, ATMA etc.

- ③ Less penetration of microirrigation
→ 20% as per NITI data.

Measures to improve water use efficiency

- ① Microirrigation → efficiency of 80% (NITI)
→ Also leverage drip / sprinkler
→ utilize PMKSY and microirrigation fund

- ② Land use advisory → by Swaminathan Commission
→ To move away from water guzzler crops

- ③ MSP reforms → to promote water saving crops as millets

- ④ Sustainable practices → NMSA, MCA, organic Farming, ZBNF
→ mulching, wapda etc

- ⑤ Community efforts → forming water user associa-
tion to save water and
rationalize tariff

Saving water in agriculture will not just help attain SDG 6, but will also boost production and sustainability

2. भारत में सार्वजनिक वितरण प्रणाली (PDS) के तहत फूड बास्केट में विविधता लाने के सामाजिक, आर्थिक और पर्यावरणीय लाभ क्या हैं? (150 शब्दों में उत्तर दीजिए) 10
- What are the social, economic and environmental benefits of diversifying the food basket under the Public Distribution System (PDS) in India? 10
(Answer in 150 words)

PDS system in India caters to 80 crore individuals under NFSA Act. Hence there is a huge scope for improvements and benefit dissemination.

Economic benefits : diversifying

① affordable food for masses $\Rightarrow$ millet, pulses etc. cost lower

② more export opportunity $\Rightarrow$ food left over stock
(eg) millet can be exported

③ less fiscal deficit to government
 $\rightarrow$ lower govt spending on wheat-rice due to diversification.

Social benefits

① curbing hidden hunger : calories and nutrition from millet, pulses etc

② Protein to curb malnutrition via eggs milk etc.

③ Benefiting Small & marginal farmers who grow Subsistence crops as millet, jowar, bajra

④ More options will aid maternal health reduce anaemia, stunting, etc. amongst girls as well.

Environmental benefits

① Move towards water resilient crops
→ ground water conservation
→ less saline soils

② Less fertilizer usage for pulses
→ less leaching & groundwater pollution

③ Soil texture biodiversity conservation

④ Reduced problem of stubble burning (from saddy eg in Haryana)

⑤ Dairy products and animal husbandry will provide more manure for crops

Way forward

As per Niti India @ 75 report, the PDS basket can be diversified to curb hunger as well as to produce wider benefits.

3. क्या पशुधन क्षेत्र को पुनः सक्रिय करना भारत के किसानों की संधारणीय आजीविका और आय में वृद्धि सुनिश्चित करने करने की कुंजी हो सकता है? अपने उत्तर के समर्थन में कारण प्रस्तुत कीजिए। (150 शब्दों में उत्तर दीजिए) 10

Can re-energising the livestock sector be the key to sustainable livelihood and increasing the income of Indian farmers? Give reasons in support of your answer. (Answer in 150 words) 10

Livestock sector contributes 1% to GVA in India, and employs 69% of rural women workers. Hence has huge potential.

Livestock & sustainable livelihood

- ① Yearlong livelihood by dairy as against seasonal crops
- ② Providing action from
 - monsoon shocks
 - crop failure
 - pest attack and low yield.
- ③ Diversified options
 - Dairy
 - fisheries
 - goat rearing
 - sheep rearing etc.
 - Poultry farming.
- ④ Also can participate in value addition and food processing
 - via SHGs, NRLM, Food processing schemes (SAPPA etc).

Livestock + increasing farmer income

- ① Via diversified products → dairy (milk, curd, Paneer etc)
→ via fish products
→ via wood from ships.

- ② Income from manure → via cow dung
→ goat droppings

- ③ Adopting integrated farming and ZONF
→ Reducing input cost by 30-50% (DTE)
→ improving earnings

- ④ Participating in e-commerce supply chain
& cooperatives
→ eg trifol per Amul milk federation
Big Basket, ITC - ceharpal etc

- Way forward → furthuring animal husbandry
and dairy fund
→ Karnathen, Goat mision etc.
→ PLI scheme for animal husbandry
products.

As suggested by Dalwai Commission and
PM's 4 point plan, livestock sector can help
double farmer income and provide livelihood.

4. क्या आप इस बात से सहमत हैं कि आर्थिक सुधार के बाद की अवधि में उच्च आर्थिक संवृद्धि के परिणामस्वरूप संवृद्धि का लाभ हाशिए पर मौजूद वर्गों तक नहीं पहुंच पाया है, जिससे समावेशी विकास चिंता का एक प्रमुख विषय बन गया है? अपने उत्तर का औचित्य सिद्ध कीजिए। (150 शब्दों में उत्तर दीजिए) 10

Do you agree that high economic growth in the post-reform period has not resulted in growth trickling down to the marginalised sections, rendering inclusive growth a major concern? Justify your answer. (Answer in 150 words) 10

Economic growth since LPG era has been boosted by industrial and service sector.
Yet- inclusivity is questionable

Growth not trickling down

- ① Oxfam $\Rightarrow$ 1% Indians own 40% of wealth
Report
- ② Central 2011 $\Rightarrow$ 22% poor
- ③ UNDP $\Rightarrow$ 27% multidimensionally poor in India (down to 15% in 2024)
- ④ Per capita income: < \$ 2300

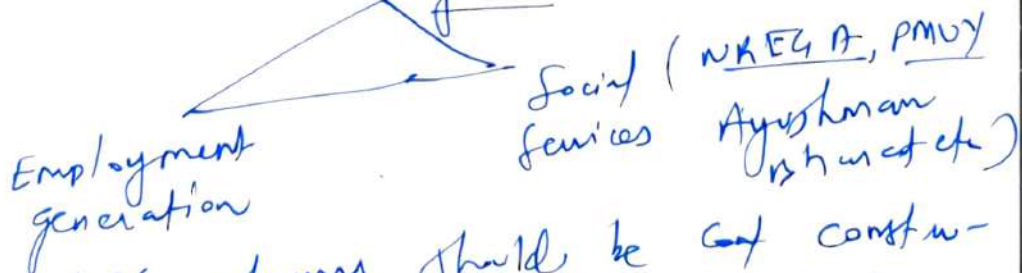
Inclusive growth a major concern

- ① Rural poverty $\Rightarrow$ 40% per capita income of urban areas
 $\Rightarrow$ 45% workforce (75% women in Agriculture)
- ② Weaker section $\Rightarrow$ Poverty amongst SC/ST range from 50-95% (NITI)

- (3) Regional imbalance: Chhattisgarh, Bihar
North East lag in growth
- (4) Women gender gap: earn 40% lesser than
men. 61% of work is unpaid.
- (5) MSME dwarfism: 50% of MSME dwarf
and contribute just 4% to GDP (ECW
Survey 2019)
- (6) Sectoral growth → manufacturing sector
contributes only 17% GVA
→ Agriculture contributes
only 18% GVA
Service growth has been higher, but employs
lesser workforce

Way forward

- (1) India's lifted 41 crore out of poverty since
2005 (UNDP) ⇒ proves effectiveness as well.
- (2) Hence need to focus on 3 pillars of
growth



The LPG reforms should be not constri-
tively reviewed to obtain not just SDG 8
(growth) but also SDG 10 (equality in
growth).

5. राष्ट्रीय स्वच्छ वायु कार्यक्रम (NCAP) के परिणाम का मूल्यांकन कीजिए। मिशन LiFE वायु प्रदूषण के मुद्दे का समाधान करने में NCAP को कैसे पुनर्जीवित कर सकता है? (150 शब्दों में उत्तर दीजिए) 10

Evaluate the outcome of the National Clean Air Programme (NCAP). How can Mission LiFE reinvigorate the NCAP in addressing the issue of air pollution? (Answer in 150 words) 10

NCAP program aimed at curbing pollution in 131 + non-attainment cities, and was launched in 2019.

Evaluation of NCAP issues

① Number of cities

⇒ more than 50 cities lagging on Particulate matter (2.5), SOX, NOX levels (DTE Report)

② Issues with installation of monitoring centres in cities

→ smog towers, precipitators, subsidies in industries

→ Laboratories for sampling

③ Capacity building of urban local bodies is needed to

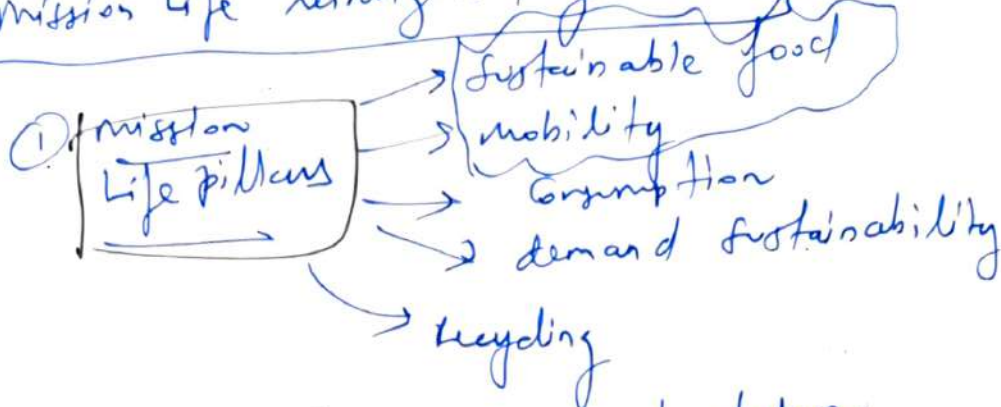
→ use NAAQS, SAFAR, SAMEER etc standards.

NCAP Success

① Rooted culture of pollution prevention in cities

- ② Set quantifiable goals : $20-30\%$ reduction in PM 2.5
- ③ Focusing on non-attainment cities and infrastructure creation (monitoring labs etc)

Mission Life reinvigorating NCAP



- ② Mobility reforms can be taken
- furthering FAME under NECMP
 - electric vehicles
 - liaise with Automobile bodies to set standards (eg) CAFE

- ③ Liaise with Energy sector
- to install scrubbers, precipitators in plants
 - to move towards Renewable energy plants, gas based plants.

Thus Mission Life can provide policy, funding, infrastructure and manpower support to NCAP to achieve its objective.

6. पारिस्थितिक तंत्र पर वनाग्नि के प्रभाव की विवेचना कीजिए। वनाग्नि के खतरे से निपटने में UNEP के फायर रेडी फॉर्मूला के महत्त्व का वर्णन कीजिए। (150 शब्दों में उत्तर दीजिए) 10
- Discuss the impact of wildfires on the ecosystem. Describe the significance of the UNEP's Fire Ready Formula in dealing with the menace of wildfires. (Answer in 150 words) 10

wildfires refer to large scale fire incidents in forest, which cause great damage to biodiversity and ecosystem.

Impact of wildfires on ecosystem

- ① Negative impact
 - (a) Damage to flora and fauna
 - (b) Soil erosion due to damage to green cover
 - (c) out migration of species and impact on food web
 - (d) Release of soil carbon
 - (e) Release of soil moisture, soil cover, threat to soil biodiversity
 - (f) Release of Black carbon causing greenhouse effect
 - (g) Barren land facilitates entry of invasive species $\Rightarrow$ further threat to biodiversity

Hawaii
maui
Australian fire

(4) loss to life, property, infrastructure
etc. $\Rightarrow$ observed in Australia.

(2) Positive impact $\Rightarrow$ nutrient recycling
 $\Rightarrow$ curbing weed growth
 $\Rightarrow$ soil regeneration.

Significance of UNEP's Fire ready formula

- ① Creating corridors in forest to break spread of fire
- ② Dealing with invasive species, causing fire as landmark
- ③ Banning infrastructure, mining, power generation, other fire causing activities
- ④ Community of participation in forest management
- ⑤ Global cooperation to deal with inter-state fires (e.g. Greece fire).
- ⑥ Also dealing with UNFCCC to reduce impact of global warming
If forest-fire is wiped then life above
earth (SDG-15) won't will be conserved,
also climate change will be tamed.

7. हाल ही में, भारतीय अंतरिक्ष अनुसंधान संगठन (इसरो) ने लघु उपग्रह प्रक्षेपण यान (SSLV) नामक अपना नया रॉकेट प्रक्षेपित किया। इसके क्या लाभ हैं? आने वाले वर्षों में SSLVs इसरो के लिए कैसे गेम चेंजर सिद्ध हो सकते हैं? (150 शब्दों में उत्तर दीजिए) 10

Recently, the Indian Space Research Organization (ISRO) launched its new rocket called Small Satellite Launch Vehicle (SSLV). What are its advantages? How can SSLVs be a game changer for ISRO in the years to come? (Answer in 150 words) 10

SSLV rocket enables launching of smaller satellites, and thus can democratize space sector for smaller nations and players in private sector.

Advantages of SSLV

- ① Low cost of launch
 - ⇒ as compared to PSLV, LVM, French Ariane Rocket etc
 - ⇒ Benefit smaller startups and nations like Bhutan.
- ② placing multiple satellites at once
- ③ can reach multiple orbits in same mission (polar, geosynchronous etc)
- ④ more private sector participation in India (e.g. Agnikul etc startups)

(5) can help launch

⇒ Nano Satellites

⇒ 3 D printed Satellites

⇒ Educational Satellite (5) KalamSat

Game changer for ISRO

(1) Global player image

⇒ Commercialize space launch to more
nations and countries private companies

(2) more revenue via Antix, NSIL etc

(3) ISRO can leverage revenue to focus

on ⇒ Gaganyaan

⇒ Shukrayaan

⇒ Space station launch

(4) Growth of Startup ecosystem in India

(5) ISRO can attract more talent from

abroad and India as many players are
interested in small satellite launches.

SSLV can play a key role in taking
space sectors to untouched sectors
and players, and thus democratize the
sector.

8. बायोपाइरेसी विकासशील विश्व के मौजूदा पारंपरिक ज्ञान के लिए प्रमुख चिंता का कारण क्यों है? भारत सरकार द्वारा मौजूदा पारंपरिक भारतीय ज्ञान की सुरक्षा के लिए क्या कदम उठाए गए हैं? (150 शब्दों में उत्तर दीजिए) 10

Why is biopiracy a cause of great concern to the existing traditional knowledge of the developing world? What steps have been taken by the government of India for protecting the existing traditional Indian knowledge? (Answer in 150 words) 10

Biopiracy refers to rogue using intellectual property of traditional knowledge for commercial gains.

Biopiracy is a cause of concern to traditional knowledge

① Deprive indigenous communities from

Access - Benefit sharing

② Benefit's move in global arena

⇒ They exploit commercially the free knowledge eg Haldi Patent by MNCs

⇒ Also do evergreening of patents

⇒ Raise cost of medicines and products

eg high cost of Ayurvedic medicines by global players

③ knowledge is distorted : by mixing

- modern chemical formulations with it -
- ④ Loss of identity for tribals, native people → when propriety knowledge is lost.

Steps taken by India to protect

- ① TKDL → Traditional knowledge data
Portal
→ provides details of all formulations
- ② Bio diversity Act 2002
⇒ setting up State, District and National Committees
⇒ deal with approvals for knowledge usage and benefit sharing.
- ③ Accession to UNCED, Nagoya protocol, Aichi targets, Kunming Protocol
⇒ for Access Benefit sharing
- ④ Vambanthur Kalyan, Vandhan Kender, Tribal Haats, Ayush programmes to promote knowledge.

Traditional knowledge needs to be safeguarded to avoid biopiracy and also empower local communities.

9. असम राइफल्स को पूर्वोत्तर भारत में सीमा प्रबंधन और उग्रवाद से निपटने में किन चुनौतियों का सामना करना पड़ता है? चर्चा कीजिए कि कैसे इन चुनौतियों के समाधान हेतु इस बल के फोकस में बदलाव की आवश्यकता है। (150 शब्दों में उत्तर दीजिए)

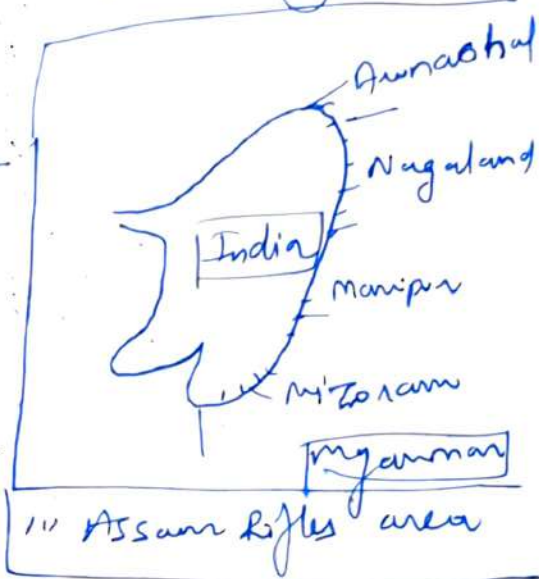
10

What are the challenges faced by the Assam Rifles with regard to border management and tackling of insurgency in North-East India? Discuss how these challenges require a reorientation of the force. (Answer in 150 words) 10

Assam rifles is oldest paramilitary force responsible for guarding indo-myanmar border

challenges faced by Assam Rifles

- ① Terrain: dense forest, rivers changing course, Tribal belts along border



- ② Insurgency across border: PLA, PLA manipur, Chin Army etc

⇒ Refugee crisis after CoP in Myanmar

- ③ Support by China & Pakistan to insurgents

- ④ Open access & trade with myanmar helps insurgent movements via roads

- ⑤ Border guarding infra (Fencing, Laser, GPS)

etc is tagging

- ⑥ Coordination with multiple agencies → Customs
→ Army
→ NCB
→ State police

- ⑦ Ethnic conflicts and tensions creating issues
→ Attack on convoy in Manipur

- ⑧ Transnational crimes → drug triangle
→ Arms smuggling
→ Drug & Human trafficking etc.

Challenges requiring reorientation

- ① Ending dual control of MHA and Defence
ministry ⇒ getting control with Defence ministry

- ② Border infra - upgrade / Manoharan Gupta
Committee - BOLD & IT, CIBMS etc

- ③ use of drones, laser etc for
tracking movements

- ④ Cross border Coordination with myanmar
Tonka

- ⑤ Pension, salary reforms

This Assam Rifles is a crucial force in need
of support from centre

10. अंतरिक्ष में शस्त्र स्थापित करने की होड़ अंतरिक्ष को शस्त्रों के संघर्ष का अगला युद्ध क्षेत्र बनाते हुए जल्द ही उस सीमा को पार कर सकती है जहां से वापस लौटना संभव नहीं होगा। अंतरिक्ष के शस्त्रीकरण के लिए उत्तरदायी संभावित कारण क्या हैं? इसके निहितार्थों पर चर्चा कीजिए। (150 शब्दों में उत्तर दीजिए) 10

The race to put weapons in space may soon pass the point of no return making space the next theatre of arms struggle. What are the possible reasons behind the weaponization of space? Discuss its implications. (Answer in 150 words) 10

Weaponization of space refers to placing weapons in lower earth orbit (LEO) and beyond. It is an emerging challenge to peace and security.

Reasons behind weaponization

- ① Legal loophole
 - ① outer space treaty bans placing conventional weapons
 - ② But nuclear weapons are not controlled
- ② Geopolitical race
 - ③ Cold war (allied) between USA & China
 - ④ Russian aggression in space (Ballistic missiles)
- ③ Technological advancements
 - ⑤ In Ballistic (ICBM), Hypersonic technologies
 - ⑥ Launch vehicle modernization
- ④ Anti-space missiles
 - ⑦ like ASAT / Phalati (Indig)
 - ⑧ various countries like China etc

Further weaponize space

⑤ Space advantages in combat

- ⇒ non traceability of weapons
- ⇒ difficult to destroy
- ⇒ can launch surprise attack

Implications → Nuclearization of space

- Space debris will rise
- Threat to smaller states (non-capable in space)
- Low drifting from peaceful use of space to military
- Geopolitical conflicts to rise

Way forward

- ① Boosting Outer space treaty 1967 and liability convention, to include nuclear weapons

- ② Space situation maritime domain aware-

- ③ trust mechanisms
- ③ NPT like treaty to disarm space.

Space is a global common, hence should be leveraged for socio-economic good, than for creating tensions.

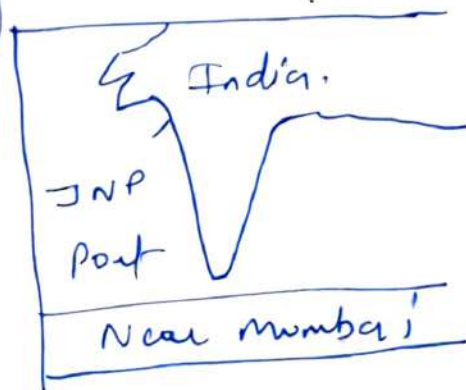
11. हाल ही में, जवाहरलाल नेहरू पत्तन (JNP) भारत का पहला 100% लैंडलॉर्ड पोर्ट बन गया है। लैंडलॉर्ड पोर्ट मॉडल से आप क्या समझते हैं? पत्तनों के प्रबंधन में प्रयुक्त विभिन्न मॉडल कौन-से हैं? (250 शब्दों में उत्तर दीजिए) 15

Jawaharlal Nehru Port (JNP) recently became the first 100% Landlord Port of India. What do you understand by the Landlord Port model? What are the different models employed in the management of ports? (Answer in 250 words) 15

Landlord port model is an emerging concept which involves private parties in port operation. Given that 90% of trade by volume of India passes through ports, it is of importance

Land Lord Port model

- ① Ownership
→ Rests with Port Authority
→ of land, machinery, docks, Rail lines



- ② Private Sector - hoped in to run the port operations

- ③ Based on Contract mentioning obligations of port authority and responsibility of private player

④ Responsibility of Port Authority

- Providing right of way & access
- Access to port Control room
- Manpower in critical operations to be provided
- oversight mechanisms

⑤ Responsibility of Private Player

④ Port operation, docking of ships

⑤ operations of cranes, container depots

⑥ Running rail operations

⑦ Technology & manpower placement

⑥ Advantages of Landlord model

(by private party)

④ Bring efficiency: reduce turnaround time (3-4 days as compared to 1 day in Singapore)

⑥ Boost capacity utilization of ports from current 55% (Niti)

⑦ Bring newer technologies such as RFID, GPS, larger container stacking

⑧ Bring operational capital to run

the port-

⑦ Advantages
for government

- ④ Cost reduction
- ⑤ Efficiency gains
- ⑥ Can leverage best practices for other ports

Different models employed in Ports

① PPP model

② HAM (Hybrid Annuity), BOT, PBOT, EPC model (construction only)

③ Greenfield construction & operation

④ eg. Waradhane port

⑤ Private Party can be a Concessionaire (government provides land)

③ government-run ports

④ Government Port Authority runs, and employs private party only in technical operations
⑤ vizag port

Way forward

under Sagarmala

Land bank model

along with

India a shipping hub.

and 'Kati Chakti' initiative

can be further employed

along with PPP models to make

12. भारत में कृषि मशीनीकरण को बढ़ावा देने के लिए शुरू की गई कृषि मशीनीकरण पर उप-मिशन (SMAM) योजना के प्रदर्शन का विश्लेषण कीजिए। (250 शब्दों में उत्तर दीजिए) 15
- Analyse the performance of the Sub-Mission on Agricultural Mechanization (SMAM) scheme launched to promote farm mechanization in India. (Answer in 250 words) 15

Agri mechanization in India will help boost agricultural productivity as well as quality of produce. In this context SMAM scheme is of immense importance.

Performance of SMAM scheme: Positives

① Boosted extent of mechanization

④ Currently ⁴⁰50% of area under cultivation is catered by mechanization

② New equipments

④ Harvesters, threshers, seeders have been introduced

③ Equipment pooling

④ via self Help groups, cooperatives

⑤ uber-like mechanization has been started in some villages

⑤ Happy seeders, Harvesters etc

① Helps small & marginal farmers
who cannot afford buying
equipment-

④ Subsidized
credit

④ For buying tractors, pumps
etc

⑤ newer
technologies

④ moved focus also to drone
based techniques.

⑥ farmgate
infrastructure

④ SMAM helped create infra-
structure at farmgate and
linkage with Agri-value
chains.

Shortcomings of SMAM

① lower
fund
allocation

④ As a portion of Agri Infra-
structure development fund

② Lack of
monitoring
mechanism

④ At village and block level
to track progress

③ Lack of
awareness

④ Amongst farmer regarding
schemes

⑤ many kishi Vigyan kendras

also do not have information

(4) Affordability (4) even after subsidy, small & marginal farmers (85%) cannot afford

(5) Credit Issues (4) Banks wary of lending without collateral

(6) Lack of Producers (4) Producers of agri equipment are low in number and geographically concentrated in North and West India

Way forward

(1) Launching PLI Scheme for mechanization

(2) Launching pooling of equipment and rental mechanism for small & agri marginal farmers

(3) Providing subsidy for stubble management equipment to also aid environment conservation

(4) Capacity building of EVKS, ATMA, etc. to boost mechanization
Providing App etc to boost mechanization
Agri mechanization via IoT can help boost farmer income (Dalwai Committee). Hence proper steps are needed to give a boost.

13. खाद्य प्रसंस्करण क्षेत्र की अप्रयुक्त क्षमता का दोहन करने और इसके सामने आने वाली चुनौतियों का समाधान करने में डिजिटलीकरण की क्षमता पर चर्चा कीजिए। (250 शब्दों में उत्तर दीजिए) 15
- Discuss the potential of digitization in harnessing the untapped potential of the food processing sector and resolving the challenges that it faces. 15
- (Answer in 250 words)

Food processing sector in India contributes 1% to GVA (GDP). And many households in rural areas are dependent on it.

Untapped potential of food processing

- ① Food diversity

① India is home to 12-15 Agro climatic zones, thus scope for Horticulture, fruits, coffee, dairy, Tea, Spices, mushroom etc.
- ② Value addition

② By estimates, 10-20% horticulture and fruits are put to value addition.
- ③ Labour Potential

③ Rural India has 67% workforce in Agriculture → It can be put to productive work in food sector.
- ④ Animal Husbandary

④ Provides 5% contribution to GVA, and huge scope & there

Challenges faced by food processing sector

- ① Farmgate infra
 - ① Lagging, and hence loss of nutrition and food grain
300 crore worth wasted
(CAG report)
- ② Value addition
 - ① Industries, machinery, skills lacking in rural area
- ③ Storage + transport
 - ① only 1% of cold storage if required is available
 - ② Issues with sorting, grading, transport etc.
- ④ Marketing
 - ① APMC issues (intellectualization, sorting, grading, price discovery)
 - ② lack of marketing, branding, shelf life improvement
- ⑤ Entrepreneurship issues
 - ① availability of credit, marketing support - etc
(44% credit is non-institutional)

Digitization of food processing

Farmgate $\Rightarrow$ transport $\Rightarrow$ cold storage $\Rightarrow$ value addition $\Rightarrow$ Distribution and marketing

① Farmgate
infra④ use of drones, mechanization
for harvest, sorting, grading

② Transport

④ use of refrigerated storage trucks
to transport③ Cold
Storage④ PPP mode can be utilized to
create warehousing⑤ digital inventory management and
temperature control

④ Distribution

④ use of GPS, RFID, GIS for
creating hub & spoke mode⑧ used by ITC & choupal⑤ Value
addition④ using color / ripening sensors⑥ Irradiation, nano technology based
on data analysis

⑥ Marketing

④ using e-nam for upstream
marketing and price discovery⑤ using GIS, Agmarknet,
ONDC etc for downstream
marketing

Therefore if digitization is done in a systematic manner, food processing sector can get rid of challenges and grow faster.

14. भारत में भू-अभिलेखों के आधुनिकीकरण का क्या महत्व है? इस आलोक में राष्ट्रीय जेनेरिक दस्तावेज पंजीकरण प्रणाली (NGDRS) की विशेषताओं का वर्णन कीजिए। (250 शब्दों में उत्तर दीजिए)

15

What is the significance of land record modernization in India? In this light, state the features of the National Generic Document Registration System (NGDRS). (Answer in 250 words)

15

India has 57% of land under cultivation (Agriculture). The rest is also under productive use in forestry, ~~the~~ urbanization or industrial use. Hence land record modernization is an imperative.

Significance of land record modernization

- ① Creating inventory ① of all land parcels for policy clarity
- ② Removing disputes ② Assigning clear titles and resolving disputes
- ③ Facilitating credit ③ The land identification will help credit dissemination and land can be used as collateral
- ④ Slum rehabilitation ④ Identifying government land and redistributing land pattern can be done, if records are

digitized.

⑤

Ease of
doing business

④ Land leasing (Haver Gann)

⑤ Land tilting (with Aayog)

⑥ Land acquisition for projects
will be facilitated.

⑥

Agriculture
growth⑦ Subsidy, fertilizer, power,
inputs can be properly
delivered to owners as well
as to tenants⑧ Tenancy reforms can also
be done

⑦

Social
Significance① Reducing animosity in rural
areas due to disputes② Creating sense of social prestige
by clarity of ownership

③ Reduction in judicial cases.

Features of NADARS

①

Identification of land
ownerMatching with
govt records

Assigning

Data entry into
system

Bhu-Aadhar under DL&MP project

② Technologies used

- ① Blockchain
- ↳ geotagging
- ↳ Aadhar & PFMS linkage
- ↳ Data sharing with banks
- ↳ Inter operability of data

③ Procedure

- ① Identification of land and assigning ownership based on supportive documents.

④ Supporting schemes

- ① Digital India land record modernization (DILRMP)
- ② Swamitva
- ③ NREGA Asset creation / linkage with GeomNREGA
- ④ subsidy distribution under PMKISAN, PMAY (Awas Yojana)
- etc.

Way forward → capacity building of Panchayats
and municipal staff
 → Formulating dispute resolution mechanism
 → Bridging digital divide for users

Thus NDARS can be a game changer in economy of land management in India.

15. 'प्रधान मंत्री फसल बीमा योजना' की शुरुआत से ही प्रौद्योगिकी के उपयोग ने इसकी सफलता में महत्वपूर्ण भूमिका निभाई है। चर्चा कीजिए। इस योजना को अधिक किसान-अनुकूल बनाने के लिए और क्या बदलाव किए जा सकते हैं? (250 शब्दों में उत्तर दीजिए) 15

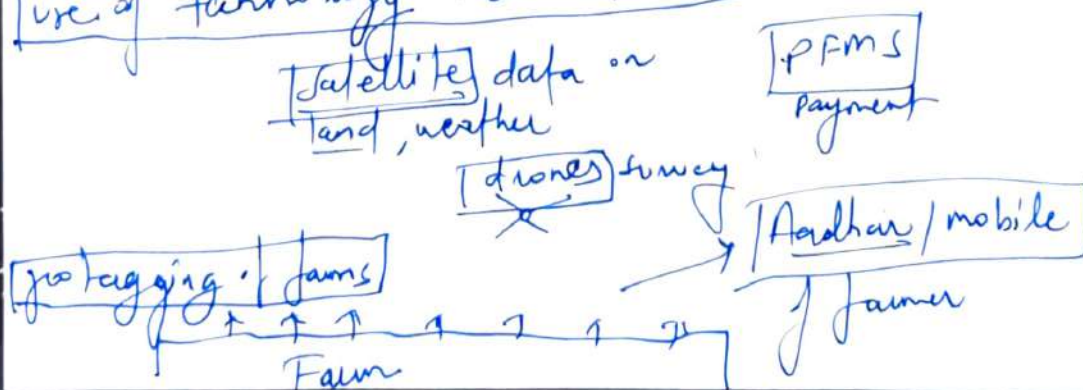
The use of technology has played a key role in the success of the 'Pradhan Mantri Fasal Bima Yojana' since its inception. Discuss. What further changes can be incorporated to make the scheme more farmer-friendly? (Answer in 250 words) 15

Pradhan Mantri Fasal Bima Yojana (PMFBY)
aims at providing insurance coverage to farmers for crops and thus saving them from monsoon shocks and disaster induced losses

PMFBY

- for Rabi & Kharif crops
- Includes Horticulture also
- 2% premium for Kharif of value
- 1.5% premium for Rabi crops
- 5% for horticulture
- subsidy on premium to be paid by state & central government

Use of technology in PMFBY



- ① Geo-tagging ⇒ of farm land / parcel
- ② Drone ⇒ For imagery of crop upon harvest
⇒ to assess damage upon disaster
- ③ Land Records ⇒ To link geo-tagged farm to
 - Bank credit
 - Aadhar and mobile data of farmer
 - Insurance Company
- ④ Satellite data ⇒ To estimate kind of damage / disaster taking place
- ⑤ Image recognition ⇒ To estimate damage due to animals, fire, pest etc
- ⑥ Financial data ⇒ JAM trinity of farmers linked with ⇒ PFMS
Insurance Company
⇒ Real time tracking of payment of premium
- ⑦ dispute resolution ⇒ do can be done via UMANG, CSC using internet portals

Further changes to make farmer friendly

① use of AT ⇒ to estimate damage based on change in crop / leaf colour
⇒ change in crop height, crop status etc

② use of blockchain ⇒ to link weather, harvest, land, insurance company, farmer details all at once

→ This will save multiple steps and coordination for farmers

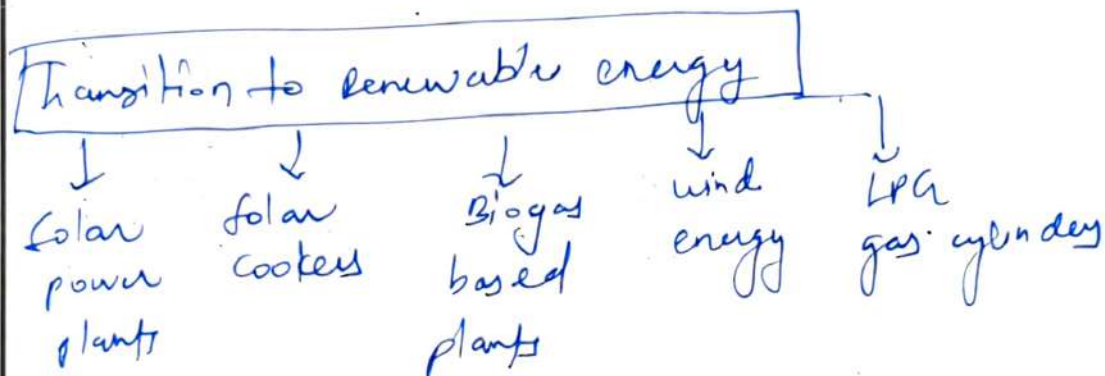
③ linkage of drones LC RFMS, KVKs, ATMA & insurance company
⇒ to estimate damage on realtime and release payments

④ using financial ERP linking State, Centre and insurance company ⇒ to track subsidy payment from Centre to State, premium payment to insurance company and loss payment to farmers

Above steps can help PM FBY be farmer friendly, and also provide them income security

16. चर्चा कीजिए कि कैसे नवीकरणीय ऊर्जा की ओर ट्रांजिशन भारत में महिलाओं के जीवन को बदलने और उनकी पूर्ण क्षमता को उजागर करने का सामर्थ्य रखता है। (250 शब्दों में उत्तर दीजिए) 15
- Discuss how the transition towards renewable energy has the potential to transform the lives of women in India and unlock their potential. (Answer in 250 words) 15

Renewable energy transition is need of the hour owing to climate change (SDG 13 and 7). But it can also help women lead a better life.



Potential to transform lives of women

① Increased energy availability

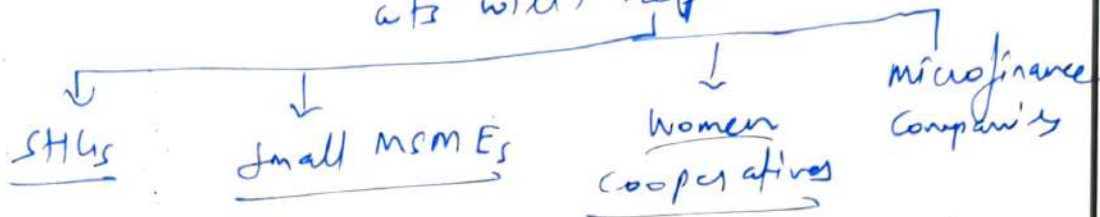
② Eco Survey 2019 highlighted Energy - Human development nexus

③ women will spend less time on fetching water from well if pumps are available

④ women education in schools, Healthcare in PHCs will be improved

(1) Improvement in literacy, IMR,
MMR, Anaemia

(2) Entrepreneurship (1) Energy availability from
renewable as against power
which will help



⇒ This women participation in Labour Force
(LFPR) will grow from current 25%. (PLFS)

(3) getting rid of firewood

(4) Dec + adoption of solar
cookers, LPG, Biogas

(5) less time spent on collecting
firewood (1 Hr daily - CSDS)

(6) less pollution and pulmonary
diseases

(7) Farming improvement

(8) Availability of decentralized
solar power in farms can improve
mechanization, and reduce mechanical
work for women

(9) Also more cold storage, food
processing, animal husbandry units
can be formed.

⑤ Safety ⑥ Streetlights due to Ujala, AJAY scheme can improve safety aspect for women

⑦ Availability of water in toilets owing to decentralized pumps can permanently eliminate open-defecation
→ Dignity of women

Unlocking women potential

- ① Entrepreneurial potential
- ② Human Capital formation
- ③ More saving ⇒ focus on nutrition, healthcare, maternal health, skilling
- ④ Reducing impact of patriarchy
- ⑤ Attain SDG all at once
 - ⑤ women empowerment
 - ⑦ clean energy
 - ⑧ Economic growth
 - ⑩ Reducing inequality

Way forward

The Panchayat announced at COP26 can be coordinated with Gram Panchayat plans (Sabki Yojana) and municipal bodies for efficient implementation of renewable energy projects.

17. जलवायु परिवर्तन भारत द्वारा भुखमरी और कुपोषण दूर करने में सामना की जाने वाली चुनौतियों में कैसे वृद्धि कर रहा है? 2030 तक शून्य भुखमरी प्राप्त करने की भारत की प्रतिबद्धता के संदर्भ में चर्चा कीजिए। (250 शब्दों में उत्तर दीजिए) 15

How does climate change exacerbate the challenges that India faces in eliminating hunger and malnutrition? Discuss in the context of India's commitment to achieve zero hunger by 2030. (Answer in 250 words) 15

India has 33% children stunted (NFHS5) and 16% population is multidimensionally poor, and hunger being a key reason for it. In this context, challenges to eliminate hunger needs to be studied.

India's commitment to achieve zero hunger by 2030

① As per UN SDG #2 to eliminate hunger

② As per Poshan Abhiyan 2.0 $\Rightarrow$ Saksham Anganwadi and Poshan

③ As per Constitutional ideals of social justice [Art-38] and eliminating hunger [Art-21 and 43]

④ Supported by National Food Security Act 2013

but climate change is creating challenges in attaining these goals.

Challenges posed by climate change

① Lower agricultural yield

⇒ DTE report - 10% reduction in crop yield, especially in central India and North West India

② Natural disaster inflicted hunger

⇒ Cyclone, landslide, Tsunami, droughts

impact → Agricultural yield

→ food supply chain

→ food storage by FCI

⇒ cause loss of livelihood - disability

→ Impacts affordability of population

→ Also more spending on health than nutrition needs to be made

③ Impact of Heatwave & Cold wave

→ Induce crop damage

→ As per ILRI Heatwave cause productivity loss and climate loss, thus inducing hunger

④ Maternal health and nutrition

⇒ owing to damage to foetal intra, maternal

Health is impacted

→ more non-institutional deliveries

→ less ante-natal & post-natal
care & nutrition

→ results in IMR (Infant-mortality)
and maternal mortality

⑤ Government
finances

④ More spending on adaptation
and mitigation
→ renewable energy subsidy

→ power plants on solar, wind

⑤ less loans for social spending
due to fiscal deficit.

⇒ Impact allocation to

mid day meal/ Posham	NFSA	NFSM	Ayushman Bharat	Natav- vandan etc.
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Way forward

① Investing in climate smart Agriculture :
NMISA, M-CRA, ZBNF, organic to preserve
yield

② Following Sendai Framework for Disaster
risk reduction - and also to make food
and health supply chain robust.
Given India's points goth on climate risk index,
steps should be taken to preserve hunger
initiatives.

18. डिजिटल ट्विन प्रौद्योगिकी से आप क्या समझते हैं? इसे अपनाने के लाभ और चुनौतियां क्या हैं?
(250 शब्दों में उत्तर दीजिए) 15

What do you understand by digital twin technology? What are the benefits and challenges in its adoption? (Answer in 250 words) 15

Digital twin technology refers to creation of digital assets using digital linkage of any asset on database.

Digital twin

① powered by Quantum technology
e.g. quantum entanglement.

② Internet of Things (IoT) can help connect devices

③ Wearable devices can help link physical and bio-chemistry traits of human beings

④ AI (Artificial Intelligence) can help predict behaviour of one machine on human beings

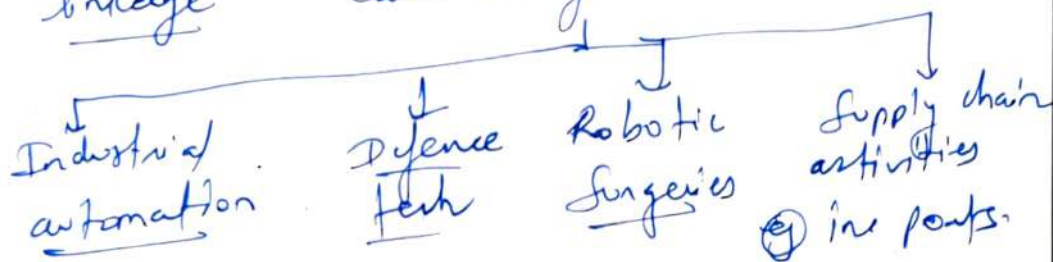
⇒ Impact and behaviour of other entity, can also be programmed.

Application and benefits of technology

① Human linkage (a) Two humans can be linked

(b) can help in teaching, mentoring, training, behavior modification

② machine linkage (a) Remotely Controlled machines can be of value in



③ Furthering

- Telemedicine
- E-Sanjeevani initiative
- Distance learning (e.g. Pragyata, PM-Evidya etc initiatives)

④ Also can be applied in

- Space science (manned missions)

- warfare technology (superimposition, entaylement etc.)

Challenges with digital twin adoption.

- ① Ethical
 - Ⓐ tampering with behavior of humans and machines
 - Ⓑ Intercession into privacy
- ② Cyber security
 - Ⓐ Can make intended benefits go away due to hacking, ransomware etc.
 - Ⓑ Digital twin can be weaponized
- ③ Data security
 - Ⓐ Data can be harvested by MNCs, states for surveillance or commercial benefits
- ④ Algorithm's accuracy
 - Ⓐ Algorithm can develop biases
 - Ⓑ There discrimination, errors may occur in

Therefore, before adoption of this new age technology, proper skilling of users, developers is needed along with robust investment in security of data and algorithms.

19. आतंकवाद के वित्तपोषण पर अंकुश लगाने हेतु किए गए अनेक प्रयासों के बावजूद अंतर्राष्ट्रीय समुदाय के लिए यह एक मुख्य चुनौती बना हुआ है। चर्चा कीजिए। (250 शब्दों में उत्तर दीजिए) 15
- Terrorism financing continues to remain a major challenge for the international community despite several efforts to curb it. Discuss. (Answer in 250 words) 15

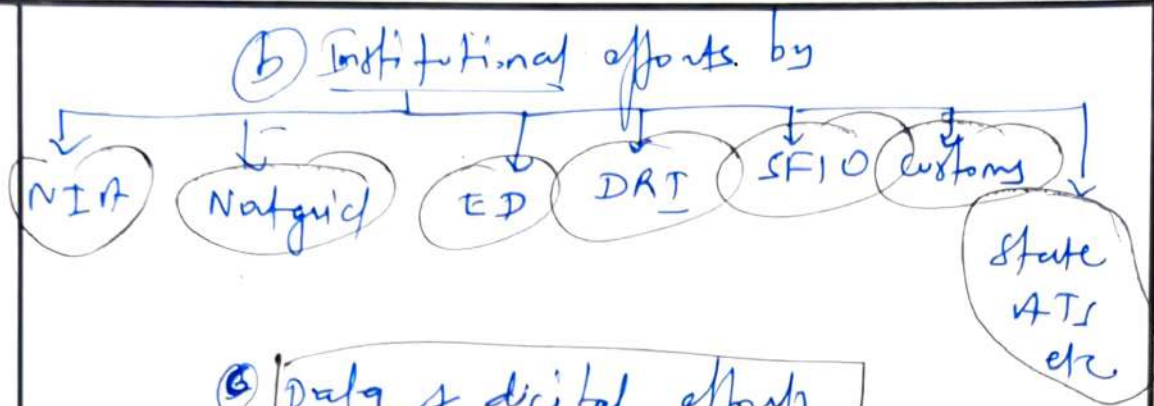
Terror financing is a cross border phenomenon, and happens by exploiting lawns in financial and payment systems of a nation.

Terror financing mechanisms challenges

- Hawala & money laundering
- crypto-currency and darknet
- Counterfeit currency, corporate crimes
- Blackhole syndrome: funding by organized crime
- State sponsored financing (eg) LeT funded by ISI etc.

Efforts to curb terror financing

- ① Domestic & legal efforts
 - PMLA to curb money laundering
 - NIA, UAPA Act
 - Fugitive offender Act



⑦ Data & digital efforts

→ Creation of unified financial database after mumbai attack

→ NBC, IAC, Natgu, NTRD, NCHPL, CERT In to control cyber - financial payments

⑧ Corporate measures to curb

→ Round tripping
→ Tax haven funding
→ Banami funding
→ Angel investing in dubious manner

⑨ International efforts

① FATF action plan / Block of grey list

② 420 OECD efforts

③ UNSC, UNCTC, UNCTS (Strategy) global counter terrorism Forum

④ Christchurch call for Action

⑤ Sanctions Committee of UNSC - 1267 / 2593

Despite of above efforts challenge remains due to

- ① → emergence of new technology → blockchain, fintech, dark-web etc
- ② → Anonymity in financing ⇒ due to darkweb
- ③ Lack of global cooperation
 - CCIT proposed by India is pending
 - Osaka Track, Budapest Convention on financial data layer is not globally accepted.
- ④ Rogue States funding terror
 - Iran (Hizbollah)
 - Pakistan (Lashkar, Jamaat)
 - China (PLA manipulation)
 - ISIS fund by many actors.

Way forward

- ① World Bank, IMF, Swift system can converge on mechanism to track financial data
 - ② CCIT proposed by India, and Budapest Convention can be linked with FATF
- Terror funding knows no boundaries, hence a global effort is required to curb menace.

20. कृत्रिम बुद्धिमत्ता (AI) में होने वाली प्रगति से राष्ट्रीय सुरक्षा के दृष्टिकोण से अवसरों के साथ-साथ चुनौतियों में भी वृद्धि होगी। भारत के संदर्भ में चर्चा कीजिए। (250 शब्दों में उत्तर दीजिए) 15
- Advances in artificial intelligence (AI) will progressively multiply the opportunities as well as challenges from the national security perspective. Discuss in the context of India. (Answer in 250 words) 15

AI is seen as a double edged sword owing to its benefits as well as challenges posed to national security. Hence topic needs scientific, legal & military attention

AI and opportunities for national security

- ① Precision weapons
 - (a) Drones, Ballistic missile, Aircraft's efficiency can be improved
 - (eg) Laser fired Spice missile relies on AI
 - Heron Drone uses GPS and AI
- ② Information security
 - (a) Applying algorithms to do ethical hacking and troubleshooting in critical infra, government datasets
 - (eg) Safeguarding banking data, power grids
- ③ Social media
 - (a) using AI to identify false news
 - (b) using AI to locate origin of

information
① using AI bots to curb spread

④ word control

② using geo-spatial data + AI to analyse word control

③ useful in curbing → lynching
→ mob violence
→ Riots

⑤ Financial ④ Natgrid, GS TIR, Travel data by Rail, Flight can be clubbed and funnel into big data using AI

⑤ Monitor - financial & physical movements of travellers and time

⑥ Syndicates
⑦ using AI to track counterfeit currency

⑥ Border security ④ using AI, laser, heat sensors to analyse border fencing

⑦ LWE ④ using AI, heatmaps, terrain maps to analyse movement of proxies

⑧ AI ④ using AI to monitor darkweb syndicates

However AI poses challenges to security

- ① New age hybrid warfare can be launched
 - Drones to drop weapons, drugs
 - Social media bots to spread false news, radicalization, Hate speech
 - done during Burhan Wami issue
 - done by China during Doklam crisis.
- ② Cyber attack → by AI induced algorithms and bots
 - e.g. attack on Cosmos Bank, Mumbai power grid
- ③ Data interception → military, DRDO data was under-attack
- ④ Financing of terror and Naxals by AI driven crypto-currency, virtual / fungible assets (NFT) etc.
- ⑤ use of AI by PLA China on ISI to target Indian cities by Hypersonic, ICBMs

Way forward

National AI mission can have a defence component as well and can coordinate with triservice command, CAPFs and Police for coordinated action.