

GENERAL STUDIES (TEST CODE : 1991)

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Medium Eng./Hindi	English	Registration Number	1018150
Center		Date	19/12/21

INDEX TABLE

Q. No.	Maximum Marks	Marks Obtained
1	10	
2	10	
3	10	
4	10	
5	10	
6	10	
7	10	
8	10	
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18	15	
19	15	
20	15	

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 (क्वैरी-अंश) 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 मिलेगा।
- 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 उसका 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. Although the treaty on Nuclear Non-Proliferation (NPT) has acquired universal acceptance, it remains deeply flawed. Analyse in the context of India's position on the issues involved. (150 words) 10

यद्यपि परमाणु अग्रसार संधि (NPT) ने सार्वजनिक स्वीकृति प्राप्त कर ली है, तथापि यह अभी भी अत्यधिक त्रुटिपूर्ण बनी हुई है। इसमें शामिल मुद्दों पर भारत के दृष्टिकोण के संदर्भ में विश्लेषण कीजिए।

The Nuclear Non-Proliferation Treaty (NPT) remains the principle instrument to ensure global peace from a nuclear armageddon.

It has universal acceptance

* upholds principle of limiting nuclear devices

↳ SSIRI → sufficient warheads present to wipe the entire planet several times over

* Ensures use of nuclear technology only for peaceful ends.

↳ Nuclear Energy

* Instrumental in maintaining peace and checking proliferation of nuclear bombs

However it remains deeply flawed from India's point of view

- * Excludes R&D in defense capabilities
- * Does not take into cognisance the nuclear threat India faces from its immediate neighbours Pak & China.
- * Does not acknowledge India's commitment to NO First Use
- * Hinders access to nuclear tech to aid India to transition to net neutral by 2070 as per COP-26 commitments through nuclear energy.

Thus while it seeks to foster stability and peace, the NPT should remain cognizant to India's track record as well as its unique strategic challenges.

2. Highlighting the existing gaps in the South Asian energy cooperation, bring out the steps taken by India to promote energy cooperation with its neighbours. (150 words) 10

दक्षिण एशियाई ऊर्जा सहयोग में विद्यमान अंतरालों पर प्रकाश डालते हुए, अपने पड़ोसियों के साथ ऊर्जा सहयोग को बढ़ावा देने के लिए भारत द्वारा उठाए गए कदमों को स्पष्ट कीजिए।

South Asian economies face the greatest threat to energy security in the light of burgeoning population and negative externalities of fossil fuels.

Current gaps in energy co-op

- ① Pakistan's denial of passage to Afghanistan → hinders TAPI, IIP pipelines.
- ② Financial challenges due to high cap ex and India's reservations to funding by China
- ③ Issues with Nepal on Kalapani & Madhesia and Bangladesh on Teesta waters exploitation
- ④ Reconciling national interest with geopolitical realities

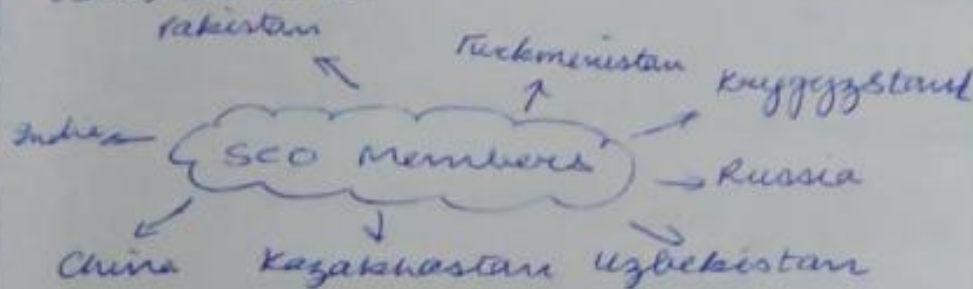
Steps by India

- ① 'One World One Sun' and the International Solar Alliance to promote South-South cooperation.
- ② Shardut and Selma dam & hydroelectricity projects in Afghanistan
- ③ Pancheshwar dam hydro power plant in Nepal
- ④ Energy co-operation and fund enhancement with Bhutan, Bangladesh, Nepal and India (BBIN)

Thus, India needs to put more impetus in energy cooperation for a vibrant South Asia

3. Critically analyse the significance of membership of the Shanghai Cooperation Organization (SCO) for India. (150 words) 10
भारत के लिए शंघाई सहयोग संगठन (SCO) की सदस्यता के महत्व का समानांतरात्मक विश्लेषण कीजिए।

India along with Pakistan joined the Shanghai Cooperation Organization (SCO) in 2013.



Significance for India

- Potential to leverage SCO help in breaking stalemate with Pakistan for TAPI and IIP pipelines
- Energy cooperation and mineral exploration as region is rich of strategic minerals
- Access to Central Asian markets and Europe through a land route

→ Fasten stronger people to people ties
through enhanced trade and
inter course

→ Boost Indian exports especially
from agriculture

However there are certain challenges

→ Emerging China - Pak - Russia
proximity

→ BRI initiative of China → debt traps

→ Encirclement of India → Maritime
Silk Road

→ Cold relations with Pak → terrorism

→ US India proximity seems to be
pushing Russia away.

As EAM said that the SCO is bound
by values of Buddhism, it continues
to be of great strategic importance

4. The wide adoption of 5G technology in India is contingent not only on robust IT infrastructure, but also on an effective cybersecurity strategy to tackle the associated risks and vulnerabilities. Analyse. (150 words) 10

भारत में 5G प्रौद्योगिकी का व्यापक रूप से अंगीकरण न केवल मजबूत IT अवसंरचना पर, बल्कि संबंधित जोखिमों और सुभेद्यताओं से निपटने के लिए एक प्रभावी साइबर सुरक्षा रणनीति पर भी निर्भर है। विश्लेषण कीजिए।

5G Technology is expected to herald the next industrial revolution as it enables AI, IoT, AR-VR, 3D ^{printing} and machine learning.

↳ Adoption of 5G on efficiency gains alone will add 0.8% to GDP.

Needs contingent infrastructure

- * Lack of R&D and existing infra
- * Extremely leveraged existing players like Idea and Vodafone
- * Spectrum changes extremely cost prohibitive
- * Limited fiscal space of govt in light of covid pandemic

Has its own challenges

- * Lead by Huawei and ZTE from China → fraught with cybersecurity risks
- * Can expose military and critical infrastructure at risk if implemented through non-friendly technology
- * Chinese ability to control private players native to the land frontier creates suspicion. eg → Tech Mahindra
- * Increased digitization means increased threat. Despite digital divide India is home to highest no. of smartphones
- Thus, India needs to build up a forward looking cyber infrastructure security policy along with international co-operation (like D10 alliance)

5. Discuss the role played by Assam Rifles in internal security of India. Also, comment on the issue of dual control structure of the force.

(150 words) 10

भारत की आंतरिक सुरक्षा में असम राइफल्स द्वारा निभाई गई भूमिका की विवेचना कीजिए। साथ ही, इस बल के दोहरे नियंत्रण की संरचना के मुद्दे पर टिप्पणी कीजिए।

Assam Rifles are a part of the Central Paramilitary Forces

(along with the Indian Coast Guard) to provide internal security.

They play a crucial role in Assam ^{in its security} given its unique challenges

→ Inter-tribal conflict and violence → Bodo v/s others

→ Assam v/s Mizoram
border issue (Jushai Hills)

→ Greater Naga/insurgency areas

→ Terrorism threat

→ ULFA-1

→ PLK threat

→ Anti-migrant rhetoric against Bangladesh migrants/refugees
→ student movements

In line of these challenges the
Nissam Rifles provides dual role: →

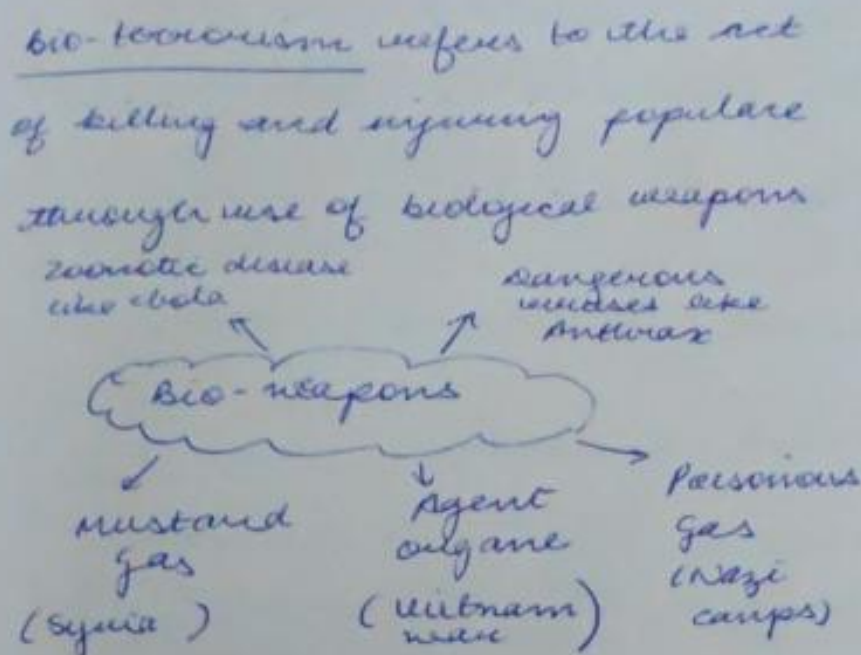
(1) Net security provided through coordination with Army against border security and terrorist threat from ULFA.

(2) Internal security to mitigate inter-tribal violence and clashes against refugees.

It is both internally and externally oriented to deal with issues emanating from both within & outside country.

6. Enumerating the existing measures to counter bio-terrorism in India, highlight the need for a bio-terrorism law. (150 words) 10

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



Need for a bio-terrorism law

- ① Bio-terrorism is not defined within constitution/legal acts like VAPA
- ② Need to foresee and mitigate risks like Disaster Management Act did for Covid pandemic

- ③ Ability to arrest, try and thwart such events
- ④ Search & seize grounds for law-enforcement
- ⑤ Bringing in best practices in intelligence from international co-operation.

Current Mechanisms

- ① India is signatory to Convention Against Bio-Chemical weapons
- ② VAPA, NTA, 2008 Act → which apply to terrorism
- ③ Provisions of IPC 1361 & CrPC in causing death, grievance & public disorder.

Thus, bio-terrorism is a new age threat that needs to be met with utmost urgency through correct legislative action.

7. Despite the progress made in ensuring better representation of women in the Indian armed forces, much more still needs to be done. Discuss.

(150 words) 10

भारतीय सशस्त्र बलों में महिलाओं का बेहतर प्रतिनिधित्व सुनिश्चित करने में हुई प्रगति के बावजूद, अभी भी बहुत कुछ किए जाने की आवश्यकता है। चर्चा कीजिए।

The Constitution envisages equal rights and opportunities for women with Art 14, 15(1), 15(3), 16(1).

However the representation of women in Armed Forces does not match this aspiration: ⇒

* Resistance by Armed forces against permanent commission for women

↳ one of the court orders stated lack of order taking by male superiors as a barrier

* Manifest patriarchy in society especially North-east which contributes maximum personnel to armed forces

* Lack of appeal of armed forces
due to misinformation from media
that Army is not for women

* Only recently permanent commission
was open for women. In its absence
there was structural disincentives
in women's participation.

* Lack of accompanying infrastructure
in defence services for women

* Lack of role models

* Resistance to give combat roles
to women → higher representation
in engineering & medical posts.

India should take a cue from
Israel in this regard and much
needs to be done to bolster women
in army.

8. Discuss the different types of clean coal technologies. Identify the challenges associated with mainstreaming clean coal technologies.

(150 words) 10

विभिन्न प्रकार की स्वच्छ कोयला प्रौद्योगिकियों की विवेचना कीजिए। स्वच्छ कोयला प्रौद्योगिकियों को मुख्यधारा में लाने से जुड़ी चुनौतियों की पहचान कीजिए।

Clean coal technologies minimize (CCT) the harmful effluents from coal burning (like CO , SO_2 , heavy metals) and make it suitable for environment.

- ① Conversion to syngas → anaerobic combustion yields syngas ($\text{CO} + \text{H}_2\text{O}$) which is cleaner fuel
- ② Washing of coal → minimizes effluents considerably
- ③ Electrostatic precipitators → more efficient in entrapping particulate emissions ($\text{PM}_{2.5}$, PM_{10})
- ④ Saylouse filters & gelation

Challenges

- ① Need heavy R & D investment
- ② Coal dependence is 55% for power generation → need large amount of money to replace
- ③ Locally produced coal is of lower quality & higher pollution due to high ash content → Non-caking coal and bituminous/lignite coal instead of anthracite
- ④ Lack of skilled labour force
- ⑤ Lack of international fin especially development agencies that raise eyebrows on coal.

CCT is required if India is to meet ~~goal~~ net zero by 2070.

9. Low Earth Orbit is becoming increasingly crowded as countries race to launch satellites into space. Highlighting the associated issues, discuss international efforts taken in this regard. (150 words) 20

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

The Low Earth Orbit supports satellites around Kauman line in atmosphere and has in recent days become very crowded.

ISSUES

① Space debris → ^{threat} Proliferation of satellites due to

- Digitisation
- Increase in telecom
- Rise of space tourism
- Increase in defence tech
- Increase need for remote sensing due to climate change, forest fires

② Risk to astronauts in space

③ Repatriating space infra like ISS

① Space tourism is not covered in
International Law → liability issues
International efforts : ⇒

* Outer space treaty

* United Nations Convention on
using outer space as global common

* China has recently developed

NEO-1 → a robotic tool to
remove space debris

* UN Secretary General has expressed
that co-operation needs to be sought
to govern Anti-Satellite Missiles

(Russia recently test-fired one against
own satellite)

Thus, while space tourism &
digitalization heralds numerous
opportunities, they need to be harmonized
with the multiple precarious risks
therein.

10. In spite of multiple benefits and growing acceptance of traditional medicine, it faces several hurdles in adoption at a large scale. Discuss. (150 words) 10

पारंपरिक चिकित्सा के विविध लाभों और बढ़ती हुई स्वीकृति के बावजूद, यह बड़े पैमाने पर अपने अंगीकरण में अनेक बाधाओं का सामना कर रही है। चर्चा कीजिए।

India has been a front-runner in traditional medicine since times of Shushruta, Charak & Patanjali and gave the world AYUSH.

(Ayurveda, Yoga, Unani, Siddhi, Homeopathy)

Growing Acceptance

- * Mainstreaming of wellness due to double disease incidence i.e. diabetes, cancer, lifestyle disease
- * Immunity supplements against covid → coronil by Patanjali, Ginger, Moringa powder
- * Knowledge about harms of excessive antibiotics and AMR.
- * Preference for natural products.

However it faces hurdles ^{in acceptance} :-

- ① Protest by ICMR initially against induction of Shalaya as surgery
- ② Allopathic systems treat it as non-scientific and placebo
- ③ Lack of international consensus on Ayurvedic surgeries
- ④ Pharma lobby v/s AYUSH
- ⑤ Scarcity of R&D into scientific utility of Indian traditional medicine

While acceptance challenges remain, AYUSH has great utilities especially in bridging the healthcare gap in rural areas and needs more R&D to boost acceptance.

11. While India-US relations have acquired greater depth in the last two decades, the policies of Washington even in this era continue to pose challenges to New Delhi's strategic interests. Discuss with adequate examples. (250 words) 15

जहाँ बिगत दो दशकों में भारत-संयुक्त राज्य अमेरिका संबंधों में और अधिक गहराई आई है, वहीं इस दौर में भी वाशिंगटन की नीतियाँ नई दिल्ली के सामरिक हितों के समक्ष चुनौतियाँ प्रस्तुत करती रही हैं। पर्याप्त उदाहरणों के साथ चर्चा कीजिए।

The partnership between India and US represents the principles of democracy, between the largest and oldest democracies in the world.

greater depth in recent times ⇒

- ① *Increased strategic coordination through quadrilateral security dialogue*
- ② *growing Indian diaspora → most affluent amongst migrants in US
→ Kamala Harris, Sundar Pichai, Satya Nadella, Parag Mehta*
- ③ *Increasing defence cooperation
→ procurement of NSSAMS from US*

- ④ 4 strategic agreements signed
- BECA → Geospatial data sharing
 - LEMONA → Logistics help to troops
 - GSMIO → Intelligence sharing

- ⑤ Booming trade and intercourse
- US is India's largest trade partner
 - Co-op in solar energy
- ⑥ Strategic alliance and common interest against an unceasingly hegemon China

But there are continued challenges

- ① Inconsistency of US policy
- Kissinger era fear of India
 - Launch of AUKUS put QUAD in question

- ② Abs fear on India - Russia ties
- 60% Indian defence support from Russia

③ Non-alignment on climate finance and greater role of developed world in climate mitigation

④ Withdrawal of GSP and push against Indian subsidies in WTO

Way Ahead

Despite the differences, the rising rift of China and its unceasing assertiveness in Indo-Pacific makes India a natural ally for U.S.

scope for enhanced co-op in

- Energy (WTI oil) Nuclear
- Trade
- Tech transfer
- Defense

Thus the challenges need to be overcome to enhance co-op

12. Even as old issues remain unresolved, WTO is faced with the challenge of striking a balance between the interest of the developed and developing world. Argue with reference to the issues brought to the fore by the worldwide impact of the COVID-19 pandemic. (250 words) 15

पुराने मुद्दों के न सुलझने के बावजूद WTO को विकसित और विकासशील विश्व के हितों के बीच संतुलन साधने की चुनौती का सामना करना पड़ रहा है। कोविड-19 महामारी के वैश्विक प्रभाव के कारण सामने आए मुद्दों के संदर्भ में तर्क प्रस्तुत कीजिए।

The WTO has heralded unbridled trade prosperity since its inception.

Unresolved historic issues

* Agreement on Agriculture

→ So far round of talks are yet to be concluded

→ Difference on subsidies between developed & developing world as minimum level ensures higher quantum of subsidies in developed but threatens food security of developing world

* US's changing stance and accusations of being overbaked → does not enjoy voting monopoly like IMF

- * Defunct dispute settlement since 2018 due to US policies
- * Continued battle on IPR rights and use of TRIPS flexibilities especially for life saving pharma-centrals
- * Issues pertaining to appropriation of GIs → Pakistan & Egypt claims on Basmati Rice

Non-Trade Challenges due to COVID-19

- * Issue on IPR rights and their waiver for vaccine production. Developed world headed for boosters even as developing world yet to receive first dose.
- * Pharma lobbying against compulsory licensing of unmedial treatments like Pfizer & Merck drugs.
- * widespread trade disruption due to global supply chain crisis and unanticipated lockdowns.

* Decline in overall world trade from the 1st time since its inception.

Way Ahead

- Need to push for making the dispute settlement process functional again
- Riders in dispute settlement to account for pandemic related delays & liabilities
- Bring in flexibilities to check vaccine nationalism and global equity in distribution
- Further period for Bali peace accord to extend support to LDCs and developing world.

Thus, WTO should ~~not~~ focus on fasttracking resolutions for both old and new challenges to give a fillip to world trade

13. The economic rise of Bangladesh is an opportunity for India and hope for South Asia. Examine.
(250 words) 15
बांग्लादेश का आर्थिक उदय भारत के लिए एक अवसर और दक्षिण एशिया के लिए आशा है। स्पष्ट कीजिए।

The economic success of Bangladesh is a testament to 50 yrs of planned welfareism since 1971

Key reasons for growth

- * Competitive labour force has promoted industrialization
- * Playing on few relative cost advantages than aiding net as per ES 2021
- * Competitive garment industry → global manufacturer for Zara
- * Financial inclusion and credit through Grameen Bank
- * Engendered development with better female labour force participation than India

Opportunity for India

- * Potential to increase and support jute industry as jute mills in India
- * India-Bangladesh joint infra development can further trade
 - Maitri Express (Kaldibari-Cuttack)
 - PIWTT → for inland waterways
- * Potential to boost economy in North-East
 - Provision of exports through Cuttack port
 - Agartala-Dibrugarh route will foster connectivity

Opportunity for South Asia

- * Ability to increase connectivity and enhance co-operation across South East Asia

→ BCIM corridor

* People to people movement
and exchange

→ BBIN Motor Vehicle Agreement
(MVA)

* Suspicious and fundamentalism
free Bangladesh important for
security of Bay of Bengal region

* Enhanced economic lift through
multilateral instruments
like BIMSTEC, SAAFC and
Mekong Ganga

Thus, an economically prosperous
Bangladesh bodes well for India
and South Asia.

14. Transboundary water resources require renewed focus in India's neighbourhood policy. Elaborate and provide adequate reasons. (250 words) 15

सीमा-पार जल संसाधन पड़ोसी देशों के प्रति भारत की नीति में नए सिरे से ध्यान केंद्रित करने की मांग कर रहे हैं। मजबूतार वर्णन कीजिए और पर्याप्त कारण प्रदान कीजिए।

'Water water everywhere but not a drop to drink' - Samuel T. Coleridge

India shares transboundary water resources with Pakistan, China, Nepal, Bhutan and Bangladesh - each having their own challenges.

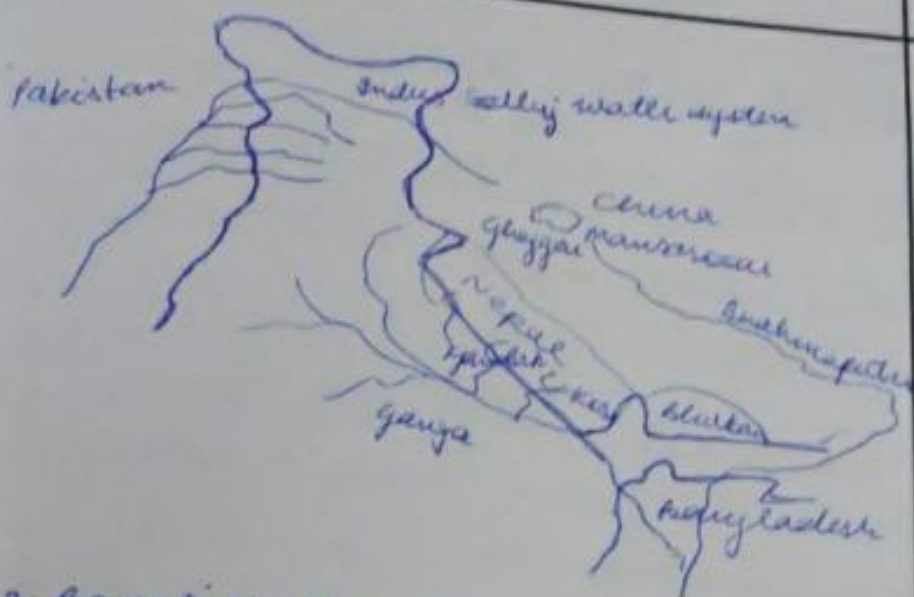
1. Pakistan

↳ Governed by Indus Water Treaty 1960

↳ Issue over Kashanganga use of the water on Tribun

↳ scope to increase Indian utilization of Kash waters

↳ current issues on non-cardial relations between the two hampering economic co-op



2. Bangladesh → Testing issues on Teesta and increased China investment on water projects
3. China → No water sharing agreement and threat to lower riparian areas through dams on Brahmaputra
4. Nepal → Recent disputes on Limpiyuduma, Lipulekh & Kalapani and issue of Kosi water flood management
5. Bhutan → Relatively lesser issues but scope for co-operation for better exploitation

Need for renewed focus

- > 50% of agriculture is irrigated and need to exploit water - banking of rivers
- Increasing water-risk → India contributes to 4% of water resources but 25% of ground water exploitation
- water security in the sight of galwan clash with china
- Need for co-operation on flood management especially in light of climate change.

Thus, to secure destiny of our future, transboundary resources require renewed diplomatic co-operation.

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

अपनी आसुचना अवसरचना और क्षमताओं को मजबूत करने के भारत के प्रयास समय और स्थायी होने के बजाय ऐतिहासिक रूप से प्रतिक्रियाशील और वृद्धिशील रहे हैं। चर्चा कीजिए। साथ ही, देश की आसुचना क्षमताओं के रणनीतिक रूप से एक ठोस ढांचा भी प्रदान कीजिए।

India has come a long way since independence in developing its intelligence capabilities.

Historically reactive framework

* NIA and MSAC developed only in the aftermath of 26/11 Mumbai terrorist attacks

* POTA as reaction to IC 814 hijacking crisis & humiliation

* Multiplicity of jurisdictions and agencies

↳ IB, MSAC, SSAC perform similar functions

↳ overlap in DRI, NCB, FIU-IND

↳ Law & order → State v/s C.B.I.

Law @ Centre

* Delay in implementation

↳ NATGRID conceived in 2013 but not yet completely operational

* Laggard in innovation

↳ Cyber threat perception remains high

↳ only incremental changes through CERT-In and Feir-CERT

↳ critical infra vulnerable despite CISO & Cyber Security Policy 2013

↳ Mumbai power plant 2013

* Economic Fugitive Offenders Act an after-thought

India needs to mature to a holistic and sustainable framework

* Enhanced international co-op like the 5 Eyes Alliance

* Need to push R&D in cyber security, dark web, IoT, AI

* Use of drone policy for border security

* Incentives to private institutions to take a lead and join intell.
- even in creating C&A like behemoths

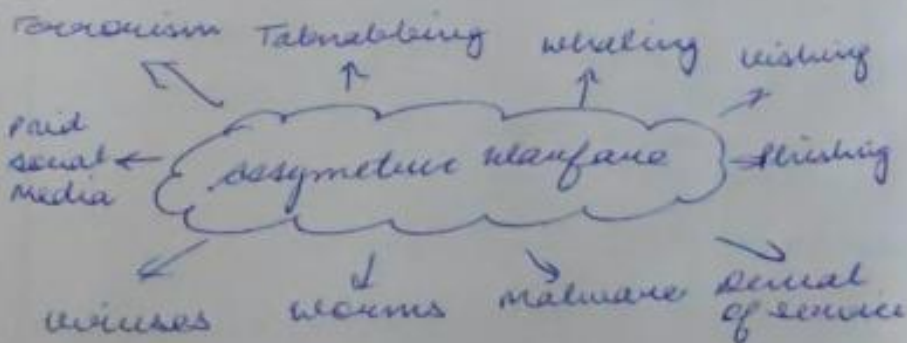
* Spur multi-disciplinary research and education in defence and intelligence

Thus a new holistic framework on intelligence has to be balanced on the trinity of innovation, international cooperation and research and pedagogy

16. The challenge of asymmetric warfare for India due to rapid progression in use of technological innovations and low costs needs ever-greater focus. Explain with domestic and global examples of recent years. (250 words) 15

तकनीकी नवाचारों के उपयोग में तीव्र प्रगति और कम लागतों के कारण भारत के लिए असममित युद्ध की चुनौती पर पहले से अधिक ध्यान देने की आवश्यकता है। हाल के वर्षों के पेरू और वैश्विक उदाहरणों के साथ स्पष्ट कीजिए।

Asymmetric warfare is one where there is no direct clash between two sides rather there is coupling of an opponent's assets without fighting through terrorism, cyber attacks, etc.



Domestic Incidents

Denial of service attack at Mumbari power plant by Chinese hackers

- ② Terror sponsored by ISI and
min-state actors in IdK
- ③ Reports of drug smuggling through
sucess in Punjab
- ④ Attack and Ransomware on
layton and payment aggregators
demanding crypto payment
- ⑤ Increasing cybercrime → NE is
emerging as ground for hackers for
easy border escape
Global Incidents
- ① Blue whale challenge where
children to suicide
- ② Cambridge Analytica and
Snowden Revelations threatened
US polity and security details
- ③ Stuxnet attack on Iran's
nuclear power plant
- ④ Assassinations

way ahead :->

Sen G had remarked that
the best warfare is one that you
don't have to fight. Higher
tech and low costs can threaten
India as :->

- ① Infra rendered non-useable
 - ② Ever increasing digital dependence
 - ③ Sovereignty of security equipment,
nuclear details, satellites endangered
 - ④ Economy crippled through stock
exchange manipulation.
 - ⑤ Secession threat of Kashmir
- Thus, there is need for a more
forward looking threat assessment
coupled with timely response.

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

राज्य और गैर-राज्य दोनों अभिवाजों द्वारा ड्रोन हमलों के प्रमुख दुश्मनों के परिपेक्ष में, ऐसे सुरक्षा खतरों से निपटने में भारत की चुनौतियों और क्षमताओं का आकलन कीजिए।
(250 words) 15

The drones have come to redefine the nature of warfare in recent times.

Use by State Actors

- Saves human casualties
- Very accurate targeting
- Ability to escape radars

The victory of Azerbaijan over Armenia was pursued in Turkey produced drones

Use by Non-State Actors

- Promote terror and smuggling
- Can be used to drop bombs
 - ↳ Attack on airport & army officer in Jammu

→ Risk of transporting drugs & narcotics

Challenges for India

- * In-house production remains low and have to bank on imports
- * Limited fiscal space especially in light of covid-19 pandemic
- * Existing terror and interland threat in IAK, LWE and insurgency in NE
- * Tech savvy China and Pakistan's proximity to Turkey to procure drones

Indian Capabilities

- * ^{New} The Drone Rules 2021 are an enhancement over OAS rules 2021 and will promote private sector investment in drone sector in light of low fiscal space for Centre

- * Improving ties with Israel and US → scope to import drones
- * DRDO has been the backbone of tech and innovation
- * S-400 missiles and multi-layer anti missile anti drone protective shield in Delhi
- ↳ Training course can be extended to drones as well → Iron-Dome

Thus despite challenges, there exist diplomatic channels as well as our own history of indigenization of technology which can guide us in weathering this storm.

18. Bring out the differences between Surface Web, Deep Web and Dark Web. Also, mention the concerns associated with use of Dark Web and steps taken by India in this context. (250 words) 15

सर्फेस वेब, डीप वेब और डार्क वेब के मध्य अंतर स्पष्ट कीजिए। साथ ही, डार्क वेब के उपयोग से जुड़ी चिंताओं और इस संदर्भ में भारत द्वारा उठाए गए कदमों का भी उल्लेख कीजिए।

Internet has revolutionized modern day economies and has become all pervasive.

Surface web refers to the ^{easily} accessible part of internet which can be reached and used by ordinary individuals through apps/ ^{sites} like Google, Yahoo, Microsoft world, Youtube.

It is analogous to an iceberg which remains only 10% above surface.

Much of internet is not accessible through normal IP protocols and

~~remains~~ remains hidden in the form of Deep web. It requires

differentiated infrastructure and
providing free access. Dark Web
is that part of internet which
is in the deep web but operates
oblivious and anti thetically to
scrutiny of government & law
enforcement.

Concerns with Dark Web :

- ① Cesspool of terrorism and
illegal activities like smuggling
and terror financing
- ② Threat to cyber security and
critical infrastructure
- ③ Lack of government scrutiny
- ④ Ineffectiveness of international
cooperation in nabbing the accused
- ⑤ Element of anonymity to perpetrator

Steps taken by India

- ① National Cyber Security Policy 2013
- ② National Centre for Co-ordination against Cyber Crime
- ③ I4C Initiative to counter dark web
- ④ International co-operation on financial intelligence through FATF, FIU-IND
- ⑤ CISO provision in critical govt. infrastructure
- ⑥ Holistic ^{intelligence} framework against terrorism comprising of NATGRID, IB, NTA, Multi PAF, ~~SSA~~ SPAC

A vigilant and proactive legislature & regulatory framework against dark web is the need of the hour.

19. What are Nano-based Agri-input and food products? Discuss the opportunities and concerns related to use of such products in India.

(250 words) 15
नैनो-आधारित कृषि आगत और खाद्य उत्पाद क्या हैं? भारत में ऐसे उत्पादों के उपयोग में संबंधित अवसरों और चिंताओं की विवेचना कीजिए।

Nano technology has redefined the contours of innovation and research. Nano-based agri input and food products use nanotechnology (i.e. particles to the size of 10 nm) as inputs in agriculture.

Benefits of nano-based agri inputs and food products

- ① Minimize wastage and effective application of inputs due to ability to delivery targetedly with high precision
- ② Environmentally more sustainable than ^{chemical} use of pesticides
↳ 65% of agri land at risk of pesticide pollution

VISION IAS

- ③ Higher productivity per unit land compared to traditional methods
- ④ Reduce ^{input} cost of agri as only the requisite dosage is provided
- ⑤ Beneficial for farmer health.
↳ Cancer belt in Punjab due to overuse of inputs
- ⑥ Avoids risk of land pollution and eutrophication of water bodies
- ⑦ Can be used to ensure food security
- ⑧ Nutrition augmentation via bio-fortification

However it is not without its share of concerns: ⇒

→ Environment is multi-variate and overall impact on ecosystem realises time for evaluation as happened with Bt-Cotton & pink bollworm

- Risk on body and health not fully studied
 - Pest resistance as a construct needs to be evaluated
 - Lack of R&D and high cost of diffusion of new technology especially in absence of enabling infrastructure or skilled workforce.
 - Impact on food chain needs to be analyzed to rule out risk of ~~biofortification~~ bio magnification & bio-accumulation
- Therefore, despite its several promises, there are environmental and healthcare concerns that need to be allayed for successful and sustainable adoption.

20. As with any major advancement in technology, robotics brings with it a spectrum of opportunities as well as challenges. Discuss in the context of India. (250 words) 15

जैसा कि प्रौद्योगिकी के क्षेत्र में किसी भी बड़ी प्रगति के साथ होता है, रोबोटिक्स भी अपने साथ अवसरों के अतिरिक्त व्यापक चुनौतियां भी प्रस्तुत करता है। भारत के संदर्भ में चर्चा कीजिए।

Robotics have ushered in unnumbered possibilities using which the world is embarking on Industrial Revolution 4.0

Opportunities for India

- * Aquaculture → Precision agriculture, Irrigation and water use efficiency
- * Mineral prospecting (oil) and exploitation to avoid rat hole mining
- * Cleaning oil spills through nano-bots
- * Advancing healthcare services especially during covid times
↳ Healthcare workers

* Industry 4.0 → New age supply chains automated through robots especially in semiconductors

* Cleaning nuclear waste and handling radioactive leakage → disaster management

* Automation of border security to check terrorism and infiltration

However Challenges remain

* Lack of R&D compared to West
→ Low govt. spending on R&D → $< 2\%$.
→ Low private sector participation

* Risk to job-security and job loss → demographic dividend can become demographic disaster

* Lack of infrastructure in terms of forward and backward linkages for industry

* Lack of enabling ecosystem & demand

WAY AHEAD

- Create incentives for private participation → PLI scheme
- supportive govt policy for growth
↳ Atmanirbhar
- Need to address current lacuna in law to address potential future roadblocks → ^{cf →} how to hold robots liable for damages?

Thus while robotics presents tremendous ~~chance~~ opportunities, they need to be harmonized in the light of challenges to be an agent of good.