



GENERAL STUDIES (TEST CODE : 2420)

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Center	Online	Date	22-08-23

INDEX TABLE

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

Total Marks Obtained:

Remarks:

Is student recommended for One-to-One mentoring?

Recommended

Strongly Recommended

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.

All the Best

1. भारत में राज्यों की राजकोषीय स्थिरता से संबंधित मौजूदा मुद्दों का परीक्षण कीजिए। इन मुद्दों के समाधान हेतु किन उपायों की आवश्यकता है?

Examine the persisting issues related to fiscal stability of states in India.

What measures are needed to address these issues? (Answer in 150 words) 10

As per Economic Survey, the debt to GDP ratio for states (combined) in FY 22-23 has remained 29.5% (20% recommended by FRBM).

Persisting issues related to fiscal stability of states

- 1) low revenue collection & high dependence on centre for funds (especially poorer states)
- 2) Asymmetry in devolution of discretionary grants under Article 282
- 3) Populist schemes by various states to garner votes resulting in high debt to GDP ratio. Eg - Free electricity in Punjab

- 4) Poor demography management by some states (UP, Bihar etc.) leading to higher revenue expenditure
- 5) Higher loans resulting in increased ~~revenue~~ interest payments in subsequent years thus perpetuating fiscal instability.

Measures needed/govt. steps

- 1) One year extension for capex loans of ₹ 1 lakh crore to states with interest free repayment for 50 years.
- 2) Restricting extra budgetary borrowing to 0.5% of GDP.
- 3) Extra budgetary borrowing to be shown in budget of states
- 4) Phasing out effective revenue deficit.

These steps would help India to become \$ 5 trillion economy by 2025.

2. उत्पादन से संबद्ध प्रोत्साहन (PLI) योजना आत्मनिर्भर भारत के लक्ष्य की प्राप्ति हेतु सरकार की प्रकार सहायता कर सकती है? इसके उद्देश्यों को प्राप्त करने में आने वाली चुनौतियाँ क्या हैं?
How can the Production Linked Incentive (PLI) Scheme help in achieving an Atmanirbhar Bharat? What are the challenges in realizing its objectives?
(Answer in 150 words) 10

Central government has announced Production Linked Incentives (PLI) for 13 emerging sectors to foster indigenous production.

Production linked Incentive (PLI) is given as 4% to 6% on incremental sales (post sale) & is announced for a 5 year period (2020-25)

PLI contribution to An Atmanirbhar Bharat

- 1) PLI will bring in much needed Foreign Direct Investment (FDI) thus boosting indigenous economy.
- 2) PLI in sectors like Food Processing Industries will lead to more employment.

of semi-skilled labour & address the issue of unemployment.

3) In sectors like automobile & semiconductors, PLI will help in India acquiring latest cutting edge technology

Challenges with PLI

- 1) low availability of skilled workforce
- 2) Bureaucratic delays & red tapism
- 3) Land acquisition & environmental clearances quite cumbersome
- 4) late devolution of funds

Way ahead

- Equal emphasis on upskilling (Skill India)
- Single window clearance
- Fostering PPP

Recent announcement of Micron technology (US) setting up a semiconductor plant in Gujarat is definitely a boost to ~~the~~ realising self sufficiency

3. जलवायु परिवर्तन में वृद्धि में मोटे अनाज की खेती का पुनरुद्धार किस प्रकार हो रहा है? भारत में मोटे अनाज के उत्पादन को बढ़ावा देने के लिए सरकार द्वारा क्या कदम उठाए गए हैं?
How is the advent of climate change leading to the revival of cultivation of millets? What steps have been taken by the government to give an impetus to millet production in India? (Answer in 150 words) 10

The year of 2023 has been recognised by UN as International Year on Millets.

India is the largest producer of millets with 20% share of the world.

Climate change leading to revival of millets

- 1) Climate change has rendered droughts more rampant & most millets (jowar, bajra, ragi etc.) are drought resistant
- 2) Millets are more resistant to fluctuating climate than conventional crops.
- 3) Instances of heatwave are on the rise throughout the world & most

milletts can withstand heatwaves .

4) lower maturity period reduces
climate related uncertainty.

Other benefits
of millets

- low glycemic index
- Ensures nutritional security
- Can be used as biofuel (Jowar)

Govt. steps to boost millet production

- 1) Price Support Scheme - to aid farmers growing millets
- 2) National Mission on Millets to boost millet production
- 3) Inclusion of millets in PDS
- 4) Strategy devised by APEEDA to promote exports of millets.

These steps would help in realizing the goal of SDG 2 (Zero Hunger)

4. चारे की खराब गुणवत्ता और उसकी अपर्याप्त उपलब्धता भारत में पशुधन की कम उत्पादकता के लिए उत्तरदायी प्रमुख कारण हैं। चर्चा कीजिए।

Poor quality and inadequate availability of feeds and fodder are the major reasons behind the low productivity of the livestock in India. Discuss.

(Answer in 150 words)

10

Livestock in India has remained one of the most inefficient & least productive in the world.

Reasons for low productivity

- 1) Poor policy implementation
- 2) No proper maintenance of livestock (vaccination, hygiene) & poor compliance with Animal Husbandry standards.
- 3) Poor quality & inadequate availability of feeds & fodder has emerged as one of the primary issue because —
 - i) Poor quality of feeds results in lower weight of livestock & increased

susceptibility to diseases.

ii) Inadequate availability leads to malnutrition & hunger which results in ~~low~~ production of milk, meat etc. along with poor quality

iii) Feeds & fodder diverted for other purposes like biomass production further aggravate the issue.

Solution/Way ahead

- 1) Promotion of integrated farming system ⇒ utilization of farm waste as feed
- 2) PM Paramparagat Krishi Vikas Yojana
- 3) Proper monitoring for compliance with standard guidelines.

These steps will help in realize the vision of Azadi Ka Amrit Mahotsav.

5. एकीकृत कीट प्रबंधन (IPM) क्या है? IPM के उद्देश्यों पर प्रकाश डालते हुए, इसके विभिन्न घटकों पर चर्चा कीजिए।

What is Integrated Pest Management (IPM)? State its objectives and discuss its various components. (Answer in 150 words) 10

Integrated Pest Management refers to comprehensive approach for eliminating different pests & boosting overall farm production.

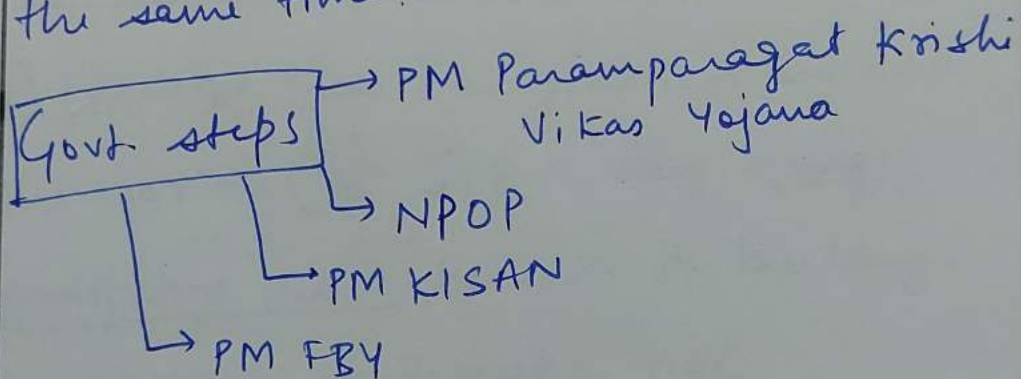
Objectives

- 1) Reducing efforts of farmer
- 2) Devising pesticides that ensure comprehensive protection of crops
- 3) Boost in agricultural productivity
- 4) Managing pests & providing nutrients to the crop at the same time
- 5) Increasing farmer income

Components

1) Bejarnot → Using neem leaves along with green chillies as a natural pesticide for a variety of crops.
(using farm produce)

2) Mulching → to help soil retaining its moisture & eliminating pests at the same time.



Integrated Pest Management (IPM) is a crucial step in ~~most~~ making India the leading agricultural exporter in the world.

6. आपदा जोखिम न्यूनीकरण में अंतर्राष्ट्रीय सहयोग के महत्व की व्याख्या कीजिए। भारत ने आपदाओं को कम करने के लिए क्षेत्रीय सहयोग को मजबूत करने के लिए क्या पहल की है?

Explain the significance of international cooperation in disaster risk reduction. What initiatives has India taken to strengthen regional cooperation for reducing disasters? (Answer in 150 words) 10

Disaster Risk Reduction is an essential component of Santiago Sendai framework (2015-2030) which is an international initiative to enhance disaster resilience.

Significance of international cooperation

- 1) Learning from best practices around the world. (Eg) - Japan using energy dissipating devices beneath its buildings to mitigate earthquake risk
- 2) Disasters are now becoming trans-national in nature thus there is need of active cooperation. Eg - Floods in India & Sri Lanka

- 3) Adoption of latest technology
- 4) Mobilisation of funds to help poorer nations maintain & disaster resilience.

Initiatives of India

- 1) Coalition for Disaster Resilient Infrastructure (CDRI)
- 2) National Disaster Management Authority (NDMA) to frame policies, regulations & guidelines for disaster management.
- 3) Active cooperation on fora like BIMSTEC, G-20, BBIN etc.

Thus, international cooperation is necessary for all round protection of the entire world (Vasudhaiva Kutumbakam).

7. अत्यधिक और अविवेकपूर्ण रेत खनन की पारिस्थितिक लागत इसके आर्थिक लाभों से कहीं अधिक है। संघारणीय रेत खनन के महत्व के संदर्भ में चर्चा कीजिए।

The ecological cost of excessive and indiscriminate sand mining far outweighs its economic benefits. Discuss in context of the importance of sustainable sand mining. (Answer in 150 words) 10

Sand is an essential minor mineral which find uses in a variety of activities.

Economic benefits of sand mining

- 1) Sand is an important construction material used in building construction.
- 2) Sand mining ^{generates} ~~provides~~ employment & revenue for government.
- 3) Sand from river bed can only be used in construction due to its moisture & binding ~~produce~~ property unlike desert sand.
- 4) It is used in fertilizer manufacturing.

Harmful effect of indiscriminate sand mining

- 1) It lowers the water level.
- 2) lowering of river level can lead to water scarcity in agriculture
- 3) It can lead to groundwater pollution
- 4) It disrupts marine ecosystem
- 5) It can increase the flow of river increasing instances of floods.

Thus, sustainable sand mining is need of the hour.

8. थिएटराइजेशन योजनाओं के पीछे निहित तर्क पर चर्चा कीजिए, जो भारत में रक्षा बलों को विशिष्ट थिएटर कमांड में एकीकृत करना है। इससे जुड़ी चुनौतियां क्या हैं?
- Discuss the rationale behind theaterisation plans, which seek to integrate the defence forces into specific theatre commands in India. What are the associated challenges? (Answer in 150 words) 10

Shetkar committee has recommended for theaterisation of commands which is already existing Andaman & Nicobar islands & strategic command (nuclear sector).

Rationale behind theaterisation

- 1) Creation of a unified command under a single command, converging the army, navy & air force in a region.
- 2) It would lead to creation of region specific commands (Western → Pakistan border, eastern & maritime (IOR)) each of which will specialise in their operations.

- 3) It would lead to enhanced efficiency.
- 4) Effective utilization military resources.
- 5) Make our defence forces more stronger.
- 6) Make India a world leader in defence.

Challenges

- 1) Little prior experience
- 2) low defence spending (reduced in recent budget)
- 3) Interoperability challenges
- 4) No clear chain of command
- 5) low clarity on who lead the command.

Despite these challenges, theatreisation will enhance India's defence sector & recent creation of Chief of Defence Staff post is a step in right direction.

9. व्याख्या कीजिए कि धन शोधन (मनी लॉन्ड्रिंग) के लिए शेल कंपनियों का उपयोग कैसे किया जाता है। भारत में धन शोधन के लिए शेल कंपनियों के उपयोग को रोकने के लिए क्या कदम उठाए गए हैं?

Describe how shell companies are used for money laundering. What steps have been taken to curb the use of shell companies for money laundering in India? (Answer in 150 words) 10

Money laundering refers to the process of converting illegitimate funds (proceeds of crime) into legitimate ones by concealing their true source of origin.

Shell companies are fake companies which exist only on paper & perform no real business activities.

Shell companies as a medium of money laundering

1) Placement stage → Large funds are broken into smaller funds & shown as investment in shell companies.

2) layering stage → Complex transaction among various shell companies are performed where funds are moved to & fro quickly to conceal their origin.

3) Integration stage → The funds from shell companies are now transferred to legitimate financial institutions.

Steps taken by government

- 1) Prevention of Money Laundering Act (PMLA) 2002
- 2) Financial Intelligence Units
- 3) Enforcement Directorate enforcing PMLA 2002
- 4) Delhi declaration of Counter Terrorism Committee

The recent amendment to PMLA act will further increase our protection against money laundering.

10. भारत ने हाल ही में अपना पहला जैविक डेटा केंद्र स्थापित किया है। इसके उद्देश्य और महत्व क्या हैं?

India has recently set up its first Biological Data Centre. What are its objectives and significance? (Answer in 150 words) 10

India has recently setup its first Biological Data Centre in Haryana where data will be stored on super computer Brahm.

Objectives & Significance

- 1) It will store the biological data collected by all government bodies & will act as a national repository.
- 2) It will lead to ~~conf~~ availability of all biological data at ~~one~~ place.
- 3) It will lead to fast retrieval & processing of data for research purposes.
- 4) It will enhance inter departmental coordination by sharing of data &

carrying out research collectively,

5) It will provide further impetus to the recent genome project launched in India.

Limitations

- 1) Privacy concerns due to cybersecurity risks
- 2) Lack of coordination among ministries
- 3) Debate of utilising public money for social expenditure or capex.

Despite the challenges, it will further boost the R & D ecosystem in India.

11. भारत में तीव्र शहरीकरण को देखते हुए, शहरी क्षेत्रों में पूंजी निवेश की बढ़ती मांग को पूरा करने के लिए म्युनिसिपल बॉण्ड्स का उपयोग करना आवश्यक हो गया है। चर्चा कीजिए।
In view of India's rapid urbanisation, it has become imperative to tap into municipal bonds to meet the rising demand of capital investment in urban areas. Discuss. (Answer in 250 words) 15

As per World Bank report (2018), 65% household population of India live in urban areas.

Urbanisation refers to the process of transformation from agrarian economy & low population towards industrial economy & higher population.

Municipal bonds as a necessary tool for raising investment

1) Municipal bonds refer to capital market bonds issued by Urban Local Bodies (ULBs) to finance their operations.

Bangalore was the city to issue municipal bonds.

2) Municipal bonds help in raising capital investment as there is always a crunch of funds with ULBs due to low devolution from states.

3) Municipal bonds allow raising investment as per the tailored requirement of different districts & away from one size fit all approach

4) It would give further impetus to 'principle of subsidiarity'

Challenges with municipal bonds

1) State government do not take guarantee of municipal bonds & thus they are associated with risk.

2) low repayment capacity of ULBs.

- 3) Bureaucratic & political corruption could lead to low confidence in them.
- 4) Disparity among urban regions where some districts have large proportion of poor population which would reduce the effectiveness of these bonds. Eg - Bastar region of Odisha

Way ahead

- 1) Maintaining a Special Purpose Vehicle for fund management.
- 2) Collecting all the funds in a escrow account & ULB can periodically deposit some amount back in them.
- 3) Guarantee of municipal bonds by state governments.

Municipal bonds effective utilization would help in achieving vision of Amrit kaal.

12. भारत ने आर्थिक संवृद्धि, महिला शिक्षा और प्रजनन दर जैसे विभिन्न विकास मानदंडों पर महत्वपूर्ण प्रगति हासिल की है। हालांकि, देश की महिला श्रम बल भागीदारी दर (FLFPR) वैश्विक स्तर पर सबसे कम है। चर्चा कीजिए। भारत में FLFPR में सुधार के लिए कौन-से कदम उठाए जा सकते हैं?
- India has achieved significant strides in various development parameters such as economic growth, women's education, and fertility rates. However, the country's Female Labour Force Participation Rate (FLFPR) remains amongst the lowest in the world. Discuss. What measures can be taken to improve the FLFPR in India? (Answer in 250 words) 15

India has been one of the fastest growing economy at 7.5% growth rate despite global headwinds. This coupled with 65% women literacy (2011 census) & recent TFR of 2 (NFHS-5) have made India one of the leading nations in world.

Despite these achievements, female LFPR has consistently declined since 1990s & is currently 25% (PLFS) [57% for men] which is a matter of concern.

Reasons for low FLFPR

① More & more women are opting for

higher education thus reducing their participation in economy.

- ② With rising household incomes, females are opting out of economic activities to take care of homes.
- ③ Socio-cultural reasons - India is largely patriarchal where women are discouraged from venturing into public sphere & taking up jobs.
- ④ lower literacy among women as compared to men [65% v/s 81%.]
- ⑤ Feminization of agriculture which often go unrecognised
- ⑥ Feminization of poverty
- ⑦ Safety issues for women, sexual harassment at workplace etc.
- ⑧ low participation of women in traditionally

male dominated sectors like STEM,
production & manufacturing etc.

Measures to improve BFLFPR

- 1) Schemes to incentivise women entrepreneurship. Eg - Standup India
- 2) Increasing participation of women in STEM → initiatives like Vigyan Jyoti, CURIE, KIRAN & GATI
- 3) DAY - NRLM target of organising 10 crore women into SHGs.
- 4) Adivasi Mahila Sashaktikaran Abhiyan by West Bengal providing soft loans to tribal women.
- 5) Priority to women in PSL lending.

These steps would ensure all round gender equality (SDG 5).

13. फसल कटाई के बाद की मूल्य श्रृंखला में अक्षमताओं के कारण लघु और सीमांत किसानों की आजीविका पर अत्यधिक प्रतिकूल प्रभाव पड़ने के साथ-साथ फसल की हानि हो रही है। भारत के संदर्भ में चर्चा कीजिए। इन चिंताओं को दूर करने के लिए सरकार ने क्या कदम उठाए हैं?

The inefficiencies in post-harvest value chain are leading to crop losses, with significant adverse impact on the livelihood of small and marginal farmers. Discuss in the context of India. What steps has the government taken to address these concerns? (Answer in 250 words) 15

Economic Survey has highlighted that post harvest losses in India are as high as 40% of total produce which adversely impacts marginal farmers.

Inefficiencies in post-harvest value chain

- 1) Lack of storage infrastructure (cold storage, godowns etc.)
- 2) Lack of proper transportation facility from farm to market specially for perishable goods
- 3) MSP procurement skewed in favour of wheat & rice which leads to their over production & procurement by FCI

leading to overflow & losses.

4) Fluctuations in market leading to poor price realisation where marginal farmer cannot even recover the input cost leads to dumping of produce.

5) Poor functioning of APMC & exploitation by middlemen leaves marginal farmers with little bargaining power.

6) Only 6% of small farmers get benefitted from MSP despite 80% procurement as they lack post harvest transportation facility & benefits are cornered by rich farmers.

7) Their inefficiency leads to falling of marginal farmers into debt trap & vicious cycle of poverty.

Steps by government to address these issues

- 1) Model Agriculture Produce & Livestock Marketing Act 2017 which provides a framework for state APMCs
- 2) PM KISAN (DBT of ₹6000 annually)
- 3) PM Fasal Bima Yojana (Crop insurance)
- 4) PM Kisan Sampada Yojana (impetus to food processing industries & creation of mega food parks)
- 5) Operation Greens - ~~₹~~ 50% subsidy in transportation & storage cost of tomato, onion, potato.

These steps are necessary for India to ensure both food & nutritional security.

14. ऊर्जा क्षेत्र के संदर्भ में डीकार्बोनाइजेशन, विकेंद्रीकरण और डिजिटलीकरण की प्रवृत्तियां तेजी से उभर रही हैं। चर्चा कीजिए।
When it comes to the energy sector, the trends of decarbonisation, decentralisation and digitisation are fast emerging. Discuss. (Answer in 250 words) 15

Energy sector in today's era occupies primary importance for national development.

Decarbonisation of energy sector

- 1) Adoption of renewable energy as an alternative to fossil fuels
- 2) NDC of India under Paris agreement to increase the share of non-fossil fuel based energy to 50% of total installed capacity
- 3) Tripling nuclear capacity by 2023 as part of LT-LEDS
- 4) Various international agreements like Kyoto protocol, Paris agreement,

UNFCCC to decarbonise energy sector

5) LEAD IT initiative of India 4

Sweden to decarbonize hard to abate industrial sectors.

Decentralisation of energy sector

1) With advent of smart grid, energy sector is decentralising at a fast pace

2) On an international level, various nations are now emerging (like India) whose energy prowess is becoming comparable to the developed nations.

3) Electricity being a state ~~at~~ subject fosters the spirit of federalism

Digitisation of energy sector

1) Concept of smart grid

- 2) Using AI to manage electricity in power grids
- 3) Real time monitoring of power plants & their generation capacity (along with actual generation).
- 4) Digital/Smart meters

Challenges

- 1) Non-recognition of common-but differentiated responsibility ~~resp~~ principle
- 2) DDoS attack on Mumbai grid in 2020 (widely believed to be done by China)
- 3) Persisting gap in productivity & capacity of energy sector in developing & developed countries.

Thus, we need to adopt multiple stakeholder approach to truly revolutionize the energy sector & achieve energy security.

15. भारत में रासायनिक आपदाओं को कम करने संबंधी चुनौतियों पर चर्चा कीजिए। इन चुनौतियों का समाधान कैसे किया जा सकता है?

Discuss the challenges in mitigating chemical disasters in India. How can these challenges be addressed? (Answer in 250 words) 15

Chemical disasters like the Bhopal Gas Tragedy still reminds of the grave implications of chemical disaster in India.

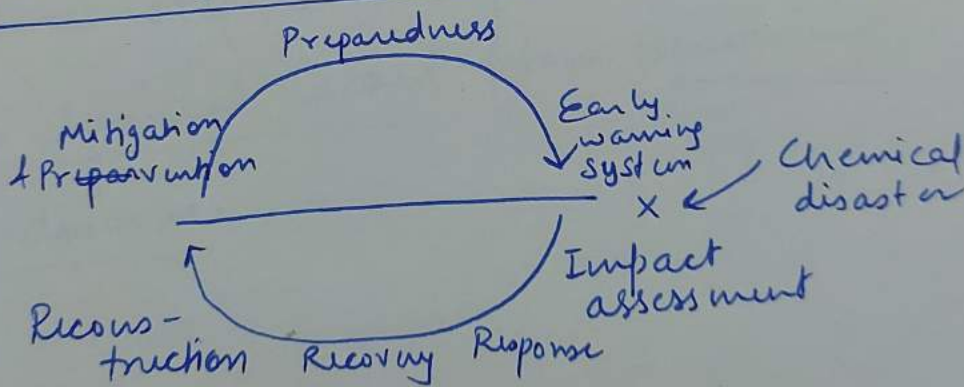
Chemical disaster refers to a disaster where toxic chemicals (like methyl cyanide) are released into open environment & pose a threat to life of humans & other living beings.

Challenges in mitigating chemical disasters

1) Standards are often not followed as set by BIS but the plants still function due to corruption & political will.

- 2) Most cities in India are overpopulated which specifically makes the chemical hazards even more disastrous.
- 3) Overpopulation has led to establishment of slums even in hazardous areas near industry not meant for habitation.
- 4) low awareness among people about the risk of chemical disasters.

Addressing these challenges → NDMA guidelines



1) Preventing such disasters from happening by ensuring strict enforcement of compliances.

2) Increasing awareness among public
& capacity building by training &
regular mock drills

3) Proper installation of early detection
systems in chemical factories to
inform in advance.

4) Building disaster resilient infra-
structure (Sendai framework)

These steps can help in preventing
the chemical hazard from becoming
a disaster.

16. जलवायु क्षतिपूर्ति (क्लाइमेट रेपेरेशन) के विचार से आप क्या समझते हैं? इस विचार को वर्तमान संदर्भ में लागू करने की आवश्यकता पर चर्चा कीजिए। इसके कार्यान्वयन के समक्ष आप क्या चुनौतियां देखते हैं?

What do you understand by the idea of climate reparations? Discuss the need to implement this idea in the current context. What are the challenges you foresee in its implementation? (Answer in 250 words) 15

Climate reparation refers to the idea of rejuvenating & reconstructing the affected climate due to anthropogenic activities.

Need for implementation of this idea

1) Simple mitigation of climate change is no longer sufficient & we need to take active measures for recovery of climate. Eg - 3rd part of AR6 of IPCC talks about mitigation wherein to limit temperature rise ~~from~~ to 1.5°C, the world need to peak ^{GHG} emissions by 2025 & ensure 47% reduction by 2030.

- 2) The world is actively heading towards various tipping points like arctic ice melting which will trigger positive feedback mechanism & threaten future generations.
- 3) Several small island nations like Maldives, Sri Lanka are already facing the implications of sea level rise.
- 4) There is a need to move away from human centric approach of environment ~~conservation~~ conservation which is ~~deep~~ shallow ecology towards deep ecology (saving environment for its intrinsic value)
- 5) Climate change triggers a variety of disasters like heatwaves in India, recent floods in Himachal Pradesh, wildfire in Australia etc

Challenges in its implementation

- 1) Balancing between growth & environmental sustainability which are often at loggerheads.
- 2) Developed countries refusal to recognize the principle of Common but Differentiated Responsibility (CBDR) as they are the ones responsible for most legacy emissions.
- 3) low availability on international fora.

Way ahead

- 1) Recognising the CBDR principle
- 2) Promotion of renewable sources of energy & phasing out fossil fuels (COP 26)
- 3) Fulfilling & further updating the Nationally Determined Contributions by member nations.

Thus, climate reparations would ensure sustainable development

17. अदृश्य युद्ध (इनविजिबल वारफेयर) क्या है? भारत की सुरक्षा के समक्ष उत्पन्न होने वाली चुनौतियों को ध्यान में रखते हुए, अदृश्य युद्ध के खतरे से निपटने के लिए उठाए गए कदमों पर चर्चा कीजिए।
What is invisible warfare? Keeping in view the challenges it poses to India's security, discuss the steps that have been taken to tackle the menace of invisible warfare. (Answer in 250 words) 15

In modern times, invisible warfare ~~refers to~~ has emerged as a potential threat to national security. It refers to use of cyberspace & cyber technology by state & non-state to disrupt national security.

Various facets of invisible warfare

- 1) Cyber warfare → Use of computer network & systems to attack
- 2) Biological warfare → Use of biological weapons (allegations on Covid-19 by China) to threaten national security
- 3) Economic warfare → Employing cheque book diplomacy to undermine sovereignty of a nation.

Challenges of invisible warfare for India

- 1) It is faceless → This kind of warfare is often characterised by anonymity where culprit is hard to catch.
- 2) Borderless nature → It operates across borders & transcends national boundaries
- 3) Ever evolving technology, especially with advent of AI & ML, cybercrimes are on the rise. As per NCRB, India witnessed around 53000 cyber attacks in 2021 costing her \$4 billion.
- 4) Difficult to monitor & prepare for such threats in advance

Steps taken by India to tackle this menace

- 1) National Cyber Policy 2013 -
Comprehensive framework for securing our cyberspace
- 2) IT Act 2008 - Enlisting various cyber offences & defining Critical Information Infrastructure
- 3) IT Rules 2023 for regulation of social media
- 4) CERT-In to respond to cyber threats immediately
- 5) Cyber crimes Investigation Cell

Curbing the menace of invisible warfare is essential to ensure national security & holistic development.

18. भारत की राष्ट्रीय सुरक्षा को बनाए रखने में भू-स्थानिक डेटा और संबद्ध तकनीकों के महत्व पर चर्चा कीजिए।

Discuss the significance of geospatial data and associated technologies in safeguarding the national security of India. (Answer in 250 words) 15

Geospatial data (such as GIS) provides data about geographical location & topography by integrating different layers like location, physical features, human settlements, topography etc.

Significance of geospatial data in national security

- 1) Border security - Active ~~surv~~ surveillance on border areas.
- 2) Energy security - Identify new areas having potential of non-conventional sources of energy (Eg - Geothermal)
- 3) Economic security - With schemes like SVAMITVA, GIS is used to provide

land records which can help in better assessment & streamlining schemes by various government departments like health, education etc.

4) Internal security - Geospatial data is helpful in fighting against Left Wing Extremism & North East Insurgency by providing insights on the difficult terrain.

5) Environmental security - Monitoring ecologically sensitive areas (eg - Joshima - th subsidence) & provide warning in advance

6) Population analysis by GIS will lead to better implementation of schemes like PDS & helps in reducing leakages.

Challenges

- 1) low investment in R & D (0.7% of GDP).
- 2) Potential misuse of geospatial data by non-state actors through hacking.
- 3) Use of geospatial data by some neighbouring countries to plan their infiltration on border.

Way ahead

- 1) More funding in R & D
- 2) Better infrastructure for safely storing the data
- 3) Comprehensive regulatory framework on geospatial data
- 4) Collaboration with other nations on emerging technologies.

These measures will help in ensuring 360° national security of India.

19. शिक्षा में कृत्रिम बुद्धिमत्ता (AI) का अनुप्रयोग पारंपरिक शिक्षण विधियों में कैसे क्रांति ला सकता है और छात्रों के लर्निंग आउटकम्स में सुधार कर सकता है? व्याख्या कीजिए।

How can the application of artificial intelligence (AI) in education revolutionize traditional teaching methods and improve student-learning outcomes? Explain. (Answer in 250 words) 15

Artificial Intelligence refers to the technology mimicking human like intelligence & taking decisions based on previously trained data set.

Application of AI in education

- 1) It will augment the existing traditional teaching methods by creating smart classrooms.
- 2) AI can help in devising specific teaching methods for different students as per their needs.
- 3) AI can help in evolving education content from one size fit all approach to designing textbooks based on local culture.

4 history

- 4) AI can foster learning in vernacular as it can translate existing textbooks into different languages (Eg - BHASHINI)
- 5) AI can help in smart & holistic evolution of evaluation of children by preventing cheating & assessing students not only on bookish knowledge but other skills as well.
- 6) AI can lead to decentralisation of education where each student can learn on their own pace
- 7) AI will address the issue of high teacher to pupil ratio
- 8) It can revolutionize education & change ~~the way~~ create digitally smart youth.

Challenges

- 1) Digital divide [49% population still

- do not have access to internet)
- 2) Exacerbating social inequalities
 - 3) Privacy concerns as AI collect personal data to improve its performance
 - 4) Possible misuse of AI to disrupt the mental health of children
 - 5) Poor infrastructure for adoption of AI

Way ahead

NEP 2020 envisions a paradigm shift in education policy in India & also recognizes embracing new technologies like AI in a phased manner with proper caution to best utilize its advantages.

20. भारत में परमाणु प्रौद्योगिकी के विकास में होमी जहांगीर भाभा का योगदान क्या है? क्या आपको लगता है कि भारत को अपनी ऊर्जा सुरक्षा सुनिश्चित करने के लिए परमाणु ऊर्जा के विकास को प्राथमिकता देनी चाहिए?

What are the contributions of Homi Jahangir Bhabha in the development of nuclear technology in India? Do you think India should prioritise the development of nuclear energy to ensure its energy security? (Answer in 250 words)

15

Homi Jahangir Bhabha was a visionary who pioneered the nuclear energy program in India & envisioned a 3 phase strategy for nuclear energy development to ensure self sufficiency.

3-phase nuclear program of Bhabha

It was made keeping in mind the vast thorium reserves in India & lack of uranium.

Stage-I \Rightarrow here enriched uranium (U^{235}) would be the main fissile material & U^{238} would be converted to Pu^{239} by absorbing neutron. Pressurized Heavy water reactor is used here.

Stage-2 \Rightarrow Pu^{239} is the main fissile material. Fast breeder reactor is used wherein Th^{232} would absorb a neutron to convert to U^{233} . (faster than the fission)

Stage-3 \Rightarrow U^{233} obtained in 2nd stage will be the fissile material & more Th^{232} would be converted to U^{233} thus becoming self sufficient.

India has reached 2nd stage.

Benefits of nuclear energy

- 1) It does not contribute to greenhouse gas emissions
- 2) It is a clean fuel & essential for achieving target of 50% installed capacity by non-fossil fuels (NDC).
- 3) The calorific value of fissile uranium is very high as compared to

coal.

Due to these benefits, India has targetted tripling its nuclear energy capacity by 2032.

Challenges with nuclear energy

- 1) Generation of radioactive waste
- 2) Hazardous accidents in the past like Chernobyl, Fukushima etc
- 3) Protest from environmentalists
- 4) Potential ~~to~~ misuse of fissile material as weapons.

Thus, there is need to be cautious in developing nuclear energy & developing capacity to harness nuclear fusion which is a safer & more reliable source of energy.