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GENERAL STUDIES (TEST CODE : 2420)

Name of Candidate	AYAN JAIN		
Medium Eng./Hindi	ENG	Registration Number	1040520
Center	ONLINE	Date	

INDEX TABLE			INSTRUCTIONS	
Q. No.	Maximum Marks	Marks Obtained	<p>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)।</p> <p>2. There are TWENTY questions printed in HINDI & ENGLISH. इसमें बीस प्रश्न हैं हिन्दी और अंग्रेजी में छपे हैं।</p> <p>3. All questions are compulsory. सभी प्रश्न अनिवार्य हैं।</p> <p>4. The number of marks carried by a question/part is indicated against it. प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।</p> <p>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।</p> <p>6. Word limit in questions, if specified, should be adhered to. प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।</p> <p>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।</p>	
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Total Marks Obtained:			Is student recommended for One-to-One mentoring?	
Remarks:				
			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. 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

The Arth Niti report of NITI Aayog has pointed out issues related to fiscal stability of states in India.

Persisting issues related to fiscal stability of states in India

- ① High reliance on devolution of funds from centre (eg) 14th Fe)
- ② Inefficient tax collection.
- ③ High level of inflation (eg) NAIRU)
- ④ Low profitability of state run enterprises (eg) PSUs)
- ⑤ Presence of populism (eg) DBT)
- ⑥ Corruption is there.
- ⑦ states' economic models are unsustainable
- ⑧ Regional differences and highly inequitable growth (eg) North-East)
- ⑨ Lack of capital expenditure.
- ⑩ Too much borrowing from centre. (eg) Article 292)
- ⑪ Lack of infrastructure creation.

Measures needed to address these issues

- ① Sustainable economic models
(eg) Avoid freebies)
- ② Harness strengths of the states
(eg) Bihar - Tourism)
- ③ Focus on capital-intensive sectors (eg) IT).
- ④ Refine formula for devolution of funds.
- ⑤ Make conditional grants to states (eg) Performance-linked)
- ⑥ focus on infrastructure creation
- ⑦ Bring in private investment.
- ⑧ Ensure fiscal discipline and fiscal prudence.
- ⑨ Harness multiplier effect of economic activities.

Recommendations of (NRSINGH) and (BIMAL JALAN) committee can help.

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 चुनौतियों 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

The Production linked incentive (PLI) scheme provides monetary incentives to manufacturers based on incremental production.

How PLI can help in achieving Atmanirbhar Bharat

- ① Gives a huge push to manufacturing (eg) M&MEs
- ② Supports domestic industry via credit availability.
- ③ Increases competitiveness of domestic players.
- ④ Reduces cost of production.
- ⑤ Reduces dependence on imports (eg) Electronics - China
- ⑥ Is aligned to 'Make in India'.
- ⑦ Ensures effective utilization of funds.
- ⑧ Encourages cottage industries.

① Augments manufacturing capacity of India.

Challenges in realizing its objectives

① High competition from foreign goods.

② Presence of monopolies.

③ Entry barriers for smaller firms.

④ Quality of products is not up to mark.

⑤ Often the funds are misused or diverted.

⑥ Not many factors are covered under PLI.

⑦ Huge fiscal burden on the government.

⑧ Many producers prefer to utilize foreign goods.

⑨ Globalization at high level

The scheme has the potential to create \$5 trillion economy. MSME can be utilized as per U R SINHA committee guidelines.

3. जलवायु परिवर्तन में वृद्धि से 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

2023-24 has been declared as the International Year of Millets by the UNGA.

How climate change led to revival of millets cultivation

- ① Millets are drought-resilient.
- ② Millets can be grown in any kind of soil.
- ③ Rainfall variability affects many crops but not millets.
- ④ Flooding is not an issue for millets.
- ⑤ Millets ensure food security and nutritional security. (WHO)
- ⑥ Millets can also be used as fodder crops for livestock.
- ⑦ They serve as a guarantee against crop failure.
- ⑧ They have low vulnerability.

to new pests due to climate change (eg. Locusts).

Steps taken by government to give impetus to millets in India

- ① Declaring them as "Shri Anna" realizing their importance.
- ② Setting up Institute of Millets Research.
- ③ Convincing UN to declare the ~~millets~~ International Year of Millets.
- ④ Sharing best practices of millets across world, states.
- ⑤ Encouraging farmers to grow millets.
- ⑥ Including millets under the One District One Product scheme.
- ⑦ Educating masses about their benefits.

Millets can help in DOUBLING FARMERS' INCOME; Recommendations of ASHOK DALWAI committee can be used.

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

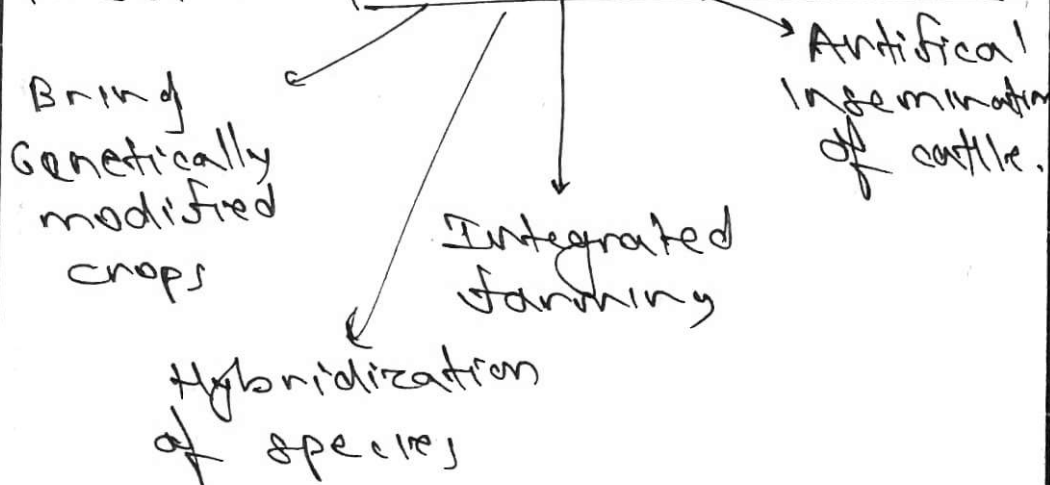
India has the largest livestock population of the world and 50% of world's buffaloes, yet productivity is very low.

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

- ① Due to food security issues, not lot of food for livestock.
- ② Usually waste food is given to the livestock.
- ③ GERM PLASM quality is low.
- ④ Health of livestock is a major issue.
- ⑤ Very little fertilization of fodder foods is done.
- ⑥ Immunization of livestock is low and they are vulnerable to diseases (109 foot and mouth disease).

- ⑦ Average yield of milk by livestock is lower than global average.
- ⑧ Livestock is not as effective draught power as other countries.
- ⑨ Farmers usually cannot afford high amounts of fodder material.
- ⑩ Fodder and feed lack enough nutritional value.
- ⑪ The livestock sector's potential has not been tapped.

Thus, it is important to focus on fodder and feed to improve productivity of the livestock. Some solutions are



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 the approach of managing ~~the~~ pests in the farm alongside improving farm yield and productivity.

Objectives of IPM

- ① Prevent pest attacks (eg. Bollworm)
- ② Improving crop yield
- ③ Ensuring food security
- ④ Minimum damage to crops by chemicals.
- ⑤ Ensuring minimum soil pollution.
- ⑥ Dealing with all kinds of pests and weeds.
- ⑦ Not contain carcinogenic / harmful chemicals.
- ⑧ Utilize technology to assist in pest removal and prevention.

- ⑨ Holistic approach towards
defending from pests.
- ⑩ Low-cost methods -

Components of IPM

- ① Chemical compounds to
remove existing pests and
prevent attacks.
- ② Mechanical solutions like
fumigation and fogging to
remove pests.
- ③ Physical solutions like
proper arrangement of
crop fields.
- ④ Technological solutions like
fore casting and early-
warning information
dissemination.

IPM can help meet the objectives
of NFSA 2013. Recommendations
of WADPWA committee and
DHARIA committee are relevant
here.

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

Disasters have taken a longer, trans-national character and hence solutions like CDRI are needed.

Significance of International Cooperation in Disaster Risk Reduction

- ① Information dissemination and early warning (eg IORA)
- ② Sharing best practices (eg CDRI)
- ③ Funds mobilization for poverty vulnerable countries (eg SIDS: Small Island Developing States)
- ④ Emergency support (eg Evacuation by India: Mission Shakti)
- ⑤ Taking concerted action towards reducing issues (eg Global warming leads to more floods, cyclones).

- ⑥ Humanitarian measures and relief support (eg food medicine) supply

Steps India has taken to strengthen regional disaster cooperation

- ① India is a part of CDRI.
- ② India extends support to FIPIC and SIDS.
- ③ SAGAR doctrine promotes regional cooperation.
- ④ Taken up the topic of DRR at SAARC and BIMSTEC.
- ⑤ Brought up issue of disasters in SCO also.
- ⑥ Participates in meetings of UN office of Disaster Risk Reduction (UNOARR)

The [SENDAI] framework and [YOKOHAMA] strategy can further help to increase regional cooperation. G20's [BBW] (Build Back better) is also important.

7. अत्यधिक और अविवेकपूर्ण रेत खनन की पारिस्थितिक लागत इसके आर्थिक लाभों से कहीं अधिक है। संधारणीय 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 a MINOR mineral which is extracted from seabeds via mining. It has huge impact on environment.

Ecological cost of indiscriminate sand mining

- ① Leads to salinization of the water bodies.
- ② Affects aquatic life negatively.
- ③ Makes the region prone to flooding.
- ④ Decreases ecosystem's stability.
- ⑤ Water pollution also means it cannot be used for various purposes like irrigation.
- ⑥ The soil in the region also becomes prone to erosion.

Thus, the ecological cost clearly outweighs the economic gain.

Due to its economic benefits,
the need of the hour is
sustainable sand mining

- ① Limits on level / amount of sand extraction.
- ② Regular monitoring by competent authority.
- ③ Research into artificial sand.
- ④ Conduct sand mining in a contractual basis.
- ⑤ Increase pro-nature activities like afforestation in the region.
- ⑥ De-siltation of water on a regular basis.
- ⑦ Overcome issue of sand mafias (eg. Madhya Pradesh)

Hence, focus should be on a harmonious balance without damage to environment. The judgement can be a guiding light.

M C MEHTA

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

The Integrated Theatre Commands are a novel feature of the Indian defence to modernize and improve the forces.

Rationale behind theaterization plans

- ① To increase the operational readiness of units.
- ② Make the units more mobile and agile.
- ③ Improve specialization of forces.
- ④ To allow mission-based deployment of different theatres.
- ⑤ To increase interoperability between different units.
- ⑥ To improve the efficiency of the forces.
- ⑦ To make the forces more

skilled for various roles.

Challenges associated with the
theaterisation of forces

- ① Requires high level of
skilling and training.
- ② Specialized equipment and
training require expenditure.
- ③ Dynamism of the forces
may get reduced.
- ④ Communication and coordination
between groups is a
challenge.
- ⑤ Short-term restructuring
of the forces may cause an
issue.
- ⑥ Unified command and proper
leadership will be required.

It is a welcome step if
implemented correctly. The
BHEKATKAR committee's ideas
on defence reforms can be
used.

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

Shell companies are secondary companies created by larger firms not for economic activity but for tax evasion or money laundering.

How shell companies are used for money laundering

- ① These companies are on paper registered as proper functioning companies.
- ② They are often established as separate legal entities.
- ③ There are transfers between parent and shell company.
- ④ Placement of black money is often done via shell companies.
- ⑤ Through artificial economic transactions, layering of the black money occurs.
- ⑥ Finally through multiple layering

term operations, integration of the black money occurs.

Steps taken by India to curb use of shell companies to prevent money laundering

- ① The PMLA ~~Act~~ (Prevention of Money Laundering Act) was amended in 2018.
- ② The Enforcement Directorate (ED) has been empowered to take action against them.
- ③ Income Tax Department conducts raids on suspicious organizations.
- ④ Extensive intelligence grids (eg NATGRID) are in place to track transactions.
- ⑤ Information sharing agreement with other countries

FATF's 40+9 recommendations and BM SHAH committee's advice can be followed.

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

In pursuance of India's policy on genetic and biodiversity, India has recently set up its first Biological Data Centre.

Objectives of the Biological Data Centre

- ① To collect data of various species.
- ② To maintain genetic banks.
- ③ To study the DNA's of various species.
- ④ To analyze the diverse genomic material of species.
- ⑤ To evolve strategies for biodiversity conservation.
- ⑥ To identify species in threat of extinction.
- ⑦ Share best practices with the world.
- ⑧ Augment India's capacity in

Biotechnology.Significance of the Biological Data Centre

- ① Boost to biotechnology and related research.
- ② Will help study evolution.
- ③ Help create many jobs.
- ④ Collaborations with other countries can be done.
- ⑤ Learnings from species' DNA can be applied.
- ⑥ Increases India's soft power in research.
- ⑦ Will prevent brain drain.
- ⑧ Biological solutions will help in conservation of wildlife as well as of the environment.

DBT and BIRAC can play a role in ensuring the Biological Data Centre is utilized to its fullest.

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, India's level of urbanization is 357.1, and cities contribute to 1/3rd of India's GDP.

Rapid urbanization in India

- ① Emergence of Census towns
- ② Creation of satellite cities.
- ③ Rural-urban links

In view of such rapid urbanisation it has become imperative to tap into municipal bonds to meet demand of capital investment

- ① Infrastructure creation requires huge capital expenditure.
- ② Municipal Bonds will ensure mobilization of funds.
- ③ Economic growth will become decentralized.

- ④ Municipal bonds will help promote Inclusive Growth.
- ⑤ In order to ensure responsible growth and sustainable cities (SDG 11)
- ⑥ To create more employment opportunities.
- ⑦ Municipal bonds will create a multiplier effect.
- ⑧ Cities have more focus on capital-intensive sectors hence greater need of bonds.
- ⑨ They will help in involving private sector.
- ⑩ Local level institutions largely rely on (95%) devolution of funds.
- ⑪ As population rises, there will be more pressure on land and resources in cities.
- ⑫ Municipal bonds can ensure disaster risk reduction is embedded in growth.

- (13) They can help increase affordable housing (169 PM AWAAY)
- (14) Municipal bonds will increase social security for vulnerable
- (15) More technological inputs will become feasible.
- (16) Domestic industries can get an impetus.
- (17) Cities will have sustainable economic models.
- (18) Liquidity crunch of states will get resolved.
- (19) Municipal bonds will allow autonomy in funds utilization.

Thus, Municipal Bonds can play a role in sustainable and responsible urbanization. Other

solutions include

- ↳ creating counter-magnets
- ↳ urban forestry and environment-friendliness
- ↳ financial independence and greater devolution to local level institutions.

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

Women's position in India has improved significantly in the last few decades.

Improved parameters

- ① LFPR to 33%. from <20%.
- ② Fertility rate < 2.1
(NFHS-5)
- ③ Reduced Maternal Mortality rate (MMR) (NFHS-5).
- ④ Increased literacy (>60%) as per (census 2011)

However, Female LFPR is amongst lowest in world, due to:

- ① Patriarchal nature of society
- ② Care Economy: Women do most housework, as per Time Use Survey.
- ③ Lower levels of education.

- ④ Lack of opportunities for skilling and training.
- ⑤ Non-conducive workplaces
(eg) Gender discrimination)
- ⑥ Family responsibilities
(eg) Maternity leave)
- ⑦ Lower remuneration for women.
- ⑧ Crimes against women (NCRB)

Measures that can be taken to improve female LFPR in India

- ① Ensure equal pay for equal work (Article ~~39~~ A1)
- ② Skilling and training of women.
- ③ Promoting STEM education
(eg) KIRAN scheme)
- ④ Attitudinal change in society
- ⑤ Vocational training to women.
- ⑥ Involving NGOs for skilling.
- ⑦ Financial independence in women (eg) via SHGs)

- ⑧ Raising the legal age of marriage for women
(Jaya Jaitrey Parel)
- ⑨ Ensuring safety of women at workplace (eg POSH Act)
- ⑩ Improve health of women
(eg More than 1/2 anaemic) *Nishakha case*
- ⑪ Create incentives in companies for hiring women (eg CSR).
- ⑫ Ensure social security benefits to women.
- ⑬ Recognize care economy as employment.
- ⑭ Education opportunities for adult women.
- ⑮ Financial incentives for families to send daughter to school and employment.

As per IMF, if FLPR becomes equal to MLPR, India's GDP will increase by 25%. Hence recommendations of (PAM RASTRI) committee will ensure (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

Post-harvest losses in India are in the range of (20-40%) which has significant price loss to farmer.

Impact of post-harvest value chain inefficiencies on small and marginal farmer

- ① Reduced crop yield.
- ② Reduced income to farmers.
- ③ Inadequate branding and marketing leads to lower profit.
- ④ Improper storage causes huge wastage of crops.
- ⑤ Slow transportation causes delay in remuneration to farmers.
- ⑥ Low value addition leading to low demand of produce.

- ⑦ Exploitation of farmers by middlemen.
- ⑧ Distress sale by farmers due to lack of information.
- ⑨ Unable to invest more for next harvest cycle.
- ⑩ Creates food security issues
- ⑪ Farmers are unable to repay debt → Debt cycle/trap
- ⑫ Many farmers are then forced to look for alternate source of livelihood.

Steps taken by the government to reduce post harvest value addition inefficiencies

- ① Improved transportation facilities such as trucks with refrigerators.
- ② Improved roads.
- ③ Created effective storage facilities (Fig) Cover and Plinth
- ④ High focus on food processing: creation of jobs in the sector.

- ⑤ Cold chain infrastructure created.
- ⑥ Nearby markets connected.
- ⑦ Introduction of KRISHI UDAAN
(transport by air)
- ⑧ KISAN RAIL (transport by rail)
- ⑨ Technological interventions
for cleaning, grading.
- ⑩ IARI plays role in research
and information dissemination.
- ⑪ formalization of Micro
Food Processing Units.
- ⑫ Minimum Support Price and
other assurances.
- ⑬ Increasing shelf-life of
farm produce.
- ⑭ Millet as a crop with lower
losses.

Reduction in post harvest losses
will increase farmers' income.

Recommendations of MS
SWAMINATHAN committee can
be followed.

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

~~Due to climate~~ Energy sector is seeing a transformation and revitalization, particularly in terms of decarbonization, decentralization and digitization.

I. Decarbonization

- ① focus on renewable energy has increased.
- ② Incentives are there for solar energy.
- ③ 'Just Energy Transition' partnerships have come up.
- ④ Many countries have pledged to 'phase down' of coal.
- ⑤ Alternatives to fossil fuels are being promoted.
- ⑥ Share of renewable energy in the energy mix has increased throughout the world. (eg India: 160 GW of RE out of 400 GW total)

- ⑦ Producers have 'renewable purchase obligations' (RPOs)
- ⑧ It is leading to lower Greenhouse gas emissions.
- ⑨ To fight climate change.

II. Decentralization

- ① Production of energy has been deregulated by the National Electricity Policy.
- ② People are engaging in rooftop solar power generation.
- ③ Solar fields are set up in remote areas.
- ④ Off-grid electricity is being promoted.
- ⑤ Farmers are being encouraged to become generators of energy (PM KUSUM).
- ⑥ Small scale energy units are coming up at various locations.
- ⑦ Government / large players are

not having monopoly anymore.

III. Digitization

- ① There is a push towards Smart grids for digital control.
- ② Smart Meters are being encouraged for earlier monitoring.
- ③ Energy records are being maintained digitally.
- ④ Will help in matching load to demand.
- ⑤ Easier load-shedding.
- ⑥ Will optimize generation.
- ⑦ Will remove scope of errors and corruption.

Thus, decarbonization, decentralization and digitization will revitalize the energy sector and promote [SDG 7]. The

[RAGIV RANGAN] committee on energy sector reforms can help further.

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 are often neglected disasters but can have far reaching impacts, (eg Bhopal Gas Tragedy 1984)

Challenges in mitigating chemical disasters in India

- ① Lack of awareness about the dangers associated.
- ② Residential colonies near chemical / industrial plants are vulnerable.
- ③ Gas leaks are often very difficult to trace.
- ④ Slow onset due to gradual chemical pollution (eg Radon)
- ⑤ Lack of strict enforcement of standards of chemical levels.
- ⑥ Inadequate safety protocols
- ⑦ • Ineffective inspection.

- ⑧ High toxicity of chemicals in regular use (eg Pesticides)
- ⑨ Lack of research about various chemicals. (eg)
- ⑩ Difficult to control a chemical disaster.
- ⑪ Chemical leaks and discharges happen very fast.
- ⑫ Indirect impact of air and water pollution.

How to address these challenges

- ① Revise the policy towards chemical disasters.
- ② Information dissemination about chemical dangers.
- ③ Research on toxicity of regular use chemicals.
- ④ Educating the masses.
- ⑤ Having evacuation routes and Standard Operating Procedures (SOPs) in place.
- ⑥ conducting regular safety audits of units dealing

with chemicals.

- ⑦ Scientific treatment of waste chemicals.
- ⑧ Detection of chemical levels
(eg) Biosensors)
- ⑨ Tracking the slow discharge
of gases/liquids.
- ⑩ Ensuring residences are
far away from industrial
units.
- ⑪ Counter-radiation methods
and technology.
- ⑫ Strict limits on chemical
quantities.
- ⑬ Capacity-building of NDRF
and SDRF.
- ⑭ Medical facilities enhance
for treatment.

Thus, chemical disasters must
be prevented, so as to ensure

SDG 3 (good health) and to
minimize damage to environment
(SDG 14 and 15).

16. जलवायु क्षतिपूर्ति (क्लाइमेट रेपरेशन) 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 reparations means that the countries who have done the most damage to the environment / contributed to climate change, should now pay for climate change mitigation and adaptation, in order to ensure climate justice.

Need to implement climate reparations

- ① It is in pursuance of the 'common but differentiated responsibilities'
- ② As per the 'Polluter Pays' principle, the countries should compensate for the damage.
- ③ Climate financing is needed.
- ④ Developed countries are largely responsible for the damage.

- ⑤ Developing countries do not have enough funds to manage climate-induced disasters.
- ⑥ To ensure climate justice and climate equity.
- ⑦ To minimize further climate change.
- ⑧ For actions needed to reduce temperature to 1.5°C of pre-industrialization levels.
- ⑨ Developing countries alone cannot ensure enough funds.

Challenges in its implementation

- ① Developed countries are reluctant to pay.
- ② Economic slowdown in world has left financial crunch.
- ③ Selfish tendency of countries.
- ④ Economic development is a must everywhere.
- ⑤ Political and diplomatie issues.
- ⑥ Lack of consensus on the matter.
- ⑦ Developing countries cannot be

forced for this.

- ⑧ 'Right to Burn' debate in many countries will serve as a disincentive.
- ⑨ Capitalistic tendency to focus on economic aspects.
- ⑩ Most global institutions like UN are dominated by the developed countries.
- ⑪ Debate over the calculation of the reparations.
- ⑫ Bilateral and regional issues between countries.
- ⑬ Breakdown of talks like in COP 27
- ⑭ Inability of developed countries to pay.

Thus, climate Reparations should be approached in a phased manner so as to meet the goals of GLASGOW PACT and to ensure climate financing at adequate levels.

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

Invisible warfare refers to the kind of warfare that is not a 'hot war' / full-fledged war but rather a series of smaller violent and non-violent conflicts without formal declaration of war.

challenges posed by Invisible Warfare to India's security

- ① Loss of life and manpower.
- ② Economic losses (eg Property)
- ③ Diverston of resources.
- ④ Lack of preparedness to such attacks.
- ⑤ Multi-modal nature of such war (eg Cyber, Economic)
- ⑥ Smaller attacks are difficult to track / detect.
- ⑦ May involve radicalization of youth / public.

- ⑧ Need to always be on guard for such war.
- ⑨ May damage / affect us without knowing (eg) Espionage
- ⑩ May explode into a full fledged warfare at any time.
- ⑪ Negatively impacts diplomatic ties.
- ⑫ Inability to create a policy / doctrine towards it.

Steps that have been taken to tackle the menace of invisible war

- ① Evolving a National Security Doctrine (ongoing)
- ② Integrated Theatre Group for high mobility.
- ③ Better surveillance (eg) Radars
- ④ Improved information networks (eg) NATGRID, MAE
- ⑤ Deployment of forces at vulnerable locations.
- ⑥ Modernization of defence forces.

- ⑦ Use of technology like UAVs (Unmanned aerial vehicles) for monitoring.
- ⑧ Improved defence equipment (LCA Tejas, S-400, Helina)
- ⑨ Non-aggression pacts being signed.
- ⑩ Information sharing agreements with other countries
- ⑪ Unified command under the Chief of Defence Staff (CDS)
- ⑫ Integrated check posts at border.
- ⑬ Cyber-security measures like CERT-In, NCIIPC

Hence, invisible warfare is a major threat to India.

Recommendations of the SHEKARR committee, NARESH CHANDRA committee and MADHUKAR GUPTA committee can be followed.

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 refers to the data involving satellites and locations on ground.

Significance of geospatial data and associated technologies in safeguarding the national security of India

- ① Help in monitoring the movement of enemy troops.
- ② Can detect military constructions on the border by other countries.
- ③ Improved surveillance capacities.
- ④ Weapons of mass destruction can be tracked by such technologies.
- ⑤ Patterns of troop movement can be collected to get idea of countries' intentions.

- ⑥ Can help assessing geographically difficult terrain (eg Himalayas)
- ⑦ communication is possible (eg Satellite-based phones)
- ⑧ Mapping of vulnerable points or locations can be done.
- ⑨ Can prepare us better for any impending attacks.
- ⑩ Help improve operational readiness of defence forces.
- ⑪ Defence forces can become prepared in advance.
- ⑫ Allows for better utilization of defence equipment.
- ⑬ Can serve as visual aid in cases of low physical visibility (eg At night)
- ⑭ Use of heat sensors can further augment this capacity.
- ⑮ Detect patterns of attacks using Big Data and Artificial

- intelligence to predict attacks
- (16) Geospatial technology can help planning military bases and outposts.
 - (17) Relaying information to the forces or the command centre is feasible.
 - (18) Very efficient mode of communication.
 - (19) Highly precise information can be obtained.
 - (20) Espionage activities can be conducted.
 - (21) Aids the capacity of our defence forces.

Thus, geospatial data and associated technologies can play a huge role in bolstering India's national security and defence capabilities. MADHUKAR GUPTA committee recommendations can be followed.

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

The introduction of Chat GPT by Open AI has revolutionized the methods of learning and have opened many opportunities for the same.

How AI in education can revolutionize traditional teaching and improve students learning outcomes

- ① Refined and updated content.
- ② Explanation of concepts to students in simple words.
- ③ Serves as a personal mentor to students.
- ④ Curriculum can be made highly customized using AI.
- ⑤ Students can ask very specific, personal doubts.
- ⑥ Compilation of knowledge

- from various places can be done easily.
- ⑦ can save time of students in unnecessary tasks.
 - ⑧ Pedagogy of teaching can be changed (eg Video lectures)
 - ⑨ Translation of content can be done in all languages.
 - ⑩ Personalized tests/exams can be designed.
 - ⑪ Automatic evaluation of test papers.
 - ⑫ AI can detect the weak areas of students and make relevant suggestions.
 - ⑬ Fun, interactive mode of learning.
 - ⑭ Students can learn at their own pace.
 - ⑮ Allows development of multi-disciplinary curriculum (eg NEP 2020, LASE - IIT Bombay)
 - ⑯ students can easily gain

knowledge about any topic of their interest.

- (17) Learning activities can be designed so as to teach in an engaging, fun manner.
- (18) Students can refer to AI chatbots for any personal queries.
- (19) Sue focus can be given to mental health.
- (20) Industry-academia linkage can be enabled by AI.
- (21) Assessment of teachers / accreditation of schools and institutions can be done.
- (22) Teacher training (eg NISHTHA) can be done effectively.

The ASILOMAR Principles on AI and ANIL BORPIA committee on education can be followed to boost role of AI in revolutionizing education.

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 is considered the father of atomic/nuclear energy in India and the research institution on Atomic research is also named after him. (Bhabha Atomic Research Institute)

Contributions of Homi Jahangir Bhabha in the development of nuclear technology in India

- ① He was the one to conceptualize nuclear research in India.
- ② Laid down the roadmap for developing nuclear technology in India.
- ③ ~~Lead~~ He led the research team on nuclear research.

- ④ He laid down the visions of nuclear energy for India.
- ⑤ He made it possible for nuclear research to be completed.
- ⑥ The nuclear tests were possible due to his contributions.
- ⑦ He spearheaded the entire nuclear energy development in India.

Yes, India should prioritize Nuclear energy to ensure energy security

- ① It is a clean fuel (No GHGs)
- ② India has abundance of Thorium (Monazite Sands)
- ③ Will ensure energy security.
- ④ Developing nuclear technology will create many jobs, both skilled and unskilled.
- ⑤ Will make India a leading player in the energy sector.
- ⑥ Will remove India's dependence

on imported coal.

- ⑦ This will lead to saving of precious funds / forex.
- ⑧ Will be a push to 'Make in India'
- ⑨ will improve India's defense capacity too.
- ⑩ It will bolster India's scientific progress overall
- ⑪ will increase India's soft power also.
- ⑫ will allow 100% rural electrification in true sense.

However, we must ensure that the ~~measures~~ measures are taken to prevent any harm from nuclear radioactivity, and must also ensure this does not prompt other countries towards nuclear warfare. There should be a clear global stance about nuclear energy, and focus more on solar energy instead.