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GENERAL STUDIES (TEST CODE : 1840)

Name of Candidate	ZUFISHAN HAQUE		
Medium Eng./Hindi	ENGLISH	Registration Number	1361130
Center	ONLINE	Date	31/09/2022

INDEX TABLE		
Q. No.	Maximum Marks	Marks Obtained
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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 (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।

16-B, 2nd Floor, Above National Trust Building, Bada Bazar Marg, Old Rajinder Nagar, Delhi-110060

Plot No. 857, 1st Floor, Banda Bahadur Marg (Opp Punjab & Sindh Bank), Dr. Mukherjee Nagar
Delhi- 110009

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 B

1. While fixed-term employment offers an ingenious way to address specific issues faced by both employers and employees, there are also some concerns associated with it. Discuss in the context of India.

(150 words) 10

हालांकि, नियत अवधि का रोजगार (फिक्स्ड टर्म एम्प्लॉयमेंट) नियोक्ताओं और कर्मचारियों दोनों के द्वारा सामना किए जाने वाले विशिष्ट मुद्दों को हल करने का एक सरल तरीका प्रदान करता है, लेकिन इसके साथ कुछ चिंताएं भी जुड़ी हुई हैं। भारत के संदर्भ में चर्चा कीजिए।

Fixed term employment ensures security of tenure to the employees. At the same time, long term association assures employers of loyalty and better specialization of skills.

Concerns associated :-

- (i) Rigid system - Fixed employment makes it difficult to 'hire - and fire' employees as per company needs.

↳ Affects the 'Ease of Doing Business' in India.

- (ii) Increased expenditure - Maintaining a large cadre of employees has added costs
- (iii) Hindrance efficiency - Employees are assured of their jobs, hence do not perform optimally
- (iv) Makes foreign investment unattractive - Foreign companies are not interested in opening factories as they fear rigid rules of employment.
- (v) Against the spirit of gig economy - Gig economy has become hugely popular and it rests on idea of short term engagement with workers

The four Labour Codes formulated by India will make contractual employments easier while considering the rights and concerns of workers

2. An efficient logistics sector with a focus on warehousing is pivotal to the success of the Bharatmala Pariyojana. Discuss. (150 words) 10
वेयरहाउसिंग पर केंद्रित एक कुशल लॉजिस्टिक्स क्षेत्रक भारतमाला परियोजना की सफलता के लिए महत्वपूर्ण है। विवेचना कीजिए।

Logistics sector involves all the processes right from packaging, transporting to storing. The Bharatmala Pariyojana which is to effort bring changes in transportation sector needs support of efficient logistics sector.

Efficient Logistics sector

- ① Reduce turnover time — Time for transportation reduces; products especially perishable are delivered fresh.
- ② Better storage and warehousing facilities — Avoid unnecessary loss. As per Dalwai Committee, 60% loss of food can be avoided.

Cold storage for agricultural products.

③ Check on theft and diversion of products - Coal transmission suffers from thefts.

④ Reduce pressure on highways
- Dedicated corridors for logistics will reduce traffic on common highway.

Efficient logistics sector is being targeted by India

- Logistics sector is declared as an 'industry' - ensure availability of long term loans

- National Logistics Policy - to make logistics expenses reach 14% of GDP

These steps will ensure success of Bharatmala Pariyojana as infrastructural development, investment on roadways will take place

3. What do you understand by the term 'irrigation scheduling'? Bringing out the advantages provided by it, discuss the difficulties faced in applying it on a farm level. (150 words) 10

'सिंचाई निर्धारण (इरिगेशन शेड्यूलिंग)' पद से आप क्या समझते हैं? इसके द्वारा उपलब्ध कराये गए लाभों का वर्णन करते हुए, इसे खेत स्तर पर लागू करने के समक्ष आने वाली कठिनाइयों की विवेचना कीजिए।

Irrigation Scheduling is the new technique being promoted for water efficiency in agriculture sector. Irrigation scheduling will ensure that water is provided at the fields at a stipulated time. Water will reach root of plants as per demand of crops.

Advantages of Irrigation Scheduling

- (i) Curbs wastage of water - Water is as per needs.
 ↳ better alternative to flood irrigation, canal irrigation.
 ↳ groundwater table is not depleted

(ii) Maintains soil fertility - Excess irrigation can cause soil erosion, nutrient loss

(iii) Better absorption of fertilisers - Water available as per need ensure, quicker absorption.

↳ nutra fertiliser is not carried by surface runoff. Thus contamination, eutrophication is avoided.

(iv) Soil does not turn saline as field is never overlogged.

Difficulties at farm level

(i) Lack of expertise - Irrigation scheduling requires knowledge to assess plant needs

(ii) Digital technology such as sensors, alarms for scheduling may not be available enough.

(iii) Application is small field - mostly rainfed is difficult (52% of India's field)

Irrigation scheduling may be deployed with support from government

4. While the Pradhan Mantri Fasal Bima Yojana was touted as the largest crop insurance scheme globally in terms of farmer participation, various concerns have arisen since its implementation. Discuss. (150 words) 10

यद्यपि, प्रधान मंत्री फसल बीमा योजना को किसानों की भागीदारी के संदर्भ में वैश्विक स्तर पर सबसे बड़ी फसल बीमा योजना बताया गया था, तथापि इसके कार्यान्वयन के बाद कई चिंताएं उत्पन्न हुई हैं। चर्चा कीजिए।

PMFBY or Pradhan Mantri Fasal Bima Yojana is an insurance scheme in which insurance is provided against crop failures. It

Farmers are made to pay premium at subsidized rate for kharif, rabi and horticulture crops. Remaining premium is paid by Centre and State.

Concerns with implementation

① PMFBY was earlier mandatory. However, this provision has now been removed.

② Premium amount by farmers is not paid at time; many

farmers lack bank accounts.
Hence, insurance amount
delivery becomes difficult.

③ Third party insurance
companies which need to
pay insurance amount
vicariously to the policy.

④ Crop failure due to a
number of reasons is not
covered.

⑤ Insurance amount is not
received on time.

⑥ Government has cited very
high rate of premium fee
certain crops.

The PMFBY is a novel
initiative to reduce the
risks associated with agriculture.
However, timely deployment of
funds and regulatory checks is needed.

5. The Stockholm Conference commenced the contemporary "environmental era", which brought a paradigm shift in the environmental governance and set a tone for multi-lateral environmental regime. Discuss. (150 words) 10
- स्टॉकहोम कॉन्फ्रेंस ने समकालीन "पर्यावरण युग" की शुरुआत की, जो पर्यावरणीय गवर्नेंस में एक आदर्श बदलाव लाया और उसने बहु-आयामी पर्यावरणीय व्यवस्था के लिए एक दिशा प्रदान की। विवेचना कीजिए।

The Stockholm Conference of 1972 was the first major conference on global scale to discuss human actions, development and its effect on environment.

Stockholm Conference, 1972

- ① Creation of United Nations Environment Programme
 - ↳ to monitor state of environment
 - ↳ to suggest policy initiatives
 - ↳ to seek collaboration of various countries.
- ② Anthropogenic factors that result in global warming

Greenhouse gas emission was discussed.

③ The idea that development needs to include environmental repugnance was set.

④ Each country was held responsible for its actions. The government of various countries had to include climate conscious decisions in governance.

⑤ It set tone for the future conferences on Environment. Eg. 1992, World Summit at Rio.

The Stockholm Conference was thus the birth of the environmental era.

6. The world has witnessed a huge surge in climate-induced disasters, which are largely driven by anthropogenic factors. In this context, analyse the role of early warning systems in mitigating the impact of the disasters.

(150 words) 10

विश्व में जलवायु-प्रेरित आपदाओं में अत्यधिक वृद्धि हुई है, जो बड़े पैमाने पर मानवजनित कारकों से प्रेरित हैं। इस संदर्भ में, आपदाओं के प्रभाव के शमन में पूर्व चेतावनी प्रणालियों की भूमिका का विश्लेषण कीजिए।

Climate change has resulted in climate extreme events. Variability in precipitation, winds and temperature alters natural system resulting in disasters.

Climate - Induced Disasters -

- ① Increase in intensity of cyclones; more cyclones on Arabian coast has been attributed to climate change.
- ② Rise in temperature in Europe 2022 has resulted in forest fires, floods in Italy.
- ③ Snow avalanches, glacial lake outburst is linked to melting of ice.

Such disasters are linked to anthropogenic factors such as greenhouse gas emission and release of particulate matter.

Role of Early Warning Systems (EWS)

- ① Use of remote sensing — to map the nature of glacial lakes to predict outburst.
- ② Assessing the level of water in rivers to predict risk of flood.
- ③ Soil quality can be assessed to account for moisture → This can reduce risk of crop failures.
- ④ EWS is used at ocean floors to detect waves of Tsunamis and also wind speed to detect cyclones.

EWS is integrated with state wide free network to send alerts to citizens. This enhances disaster preparedness.

7. Critically examine the implications of leveraging technology in policing. (150 words) 10

पुलिस व्यवस्था (पुलिसिंग) में प्रौद्योगिकी का लाभ उठाने के निहितार्थों का समालोचनात्मक परीक्षण कीजिए।

The Policing system involves identification of criminals, tracking criminal cases and gathering evidence. In each step technology can be used to quicken the process and make it accurate.

Implications of leveraging technology in policing

- ① Better collaboration. The crime and criminal tracking system has national database on FIR's registered. Helps various state police to identify criminals.
- ② Gathering evidence. Use of DNA technology makes evidence more conclusive; identification of criminals is easier.

- ③ Monitoring - use of CCTV cameras ensures effective surveillance
- ④ Maintain law and order - Online police services such as check on hate speech, online abuse keeps society peaceful at large.

Concerns

- ① Regular monitoring can invade privacy of citizens.
 - ② Data collected may be prone to prejudice and stereotypes → may target a particular community.
 - ③ Rules regarding DNA technology has not been specified.
 - ④ Better training of police official to technology will be needed.
- As criminal laws are undergoing a major overhaul, police system also needs reforms to cater to modern-day issues.

8. How far do you agree with the view that climate change poses a threat to international peace and security? (150 words) 10

आप इस विचार से कहीं तक सहमत हैं कि जलवायु परिवर्तन अंतर्राष्ट्रीय शांति और सुरक्षा के लिए खतरा है?

Climate change as per WMO includes all types of variability in winds, precipitation and temperature that exists for a decade or more

Climate change: Threat to international peace and security

① Issue of climate refugees - climate change is causing mass displacement. Climate refugees are not recognized under Refugee Convention.

② Food insecurity - climate change results in crop failures leading to hunger and inflation. Eg. Locust attack, 2020 was in Africa was result of floods associated with climate change.

③ Disasters - Disasters that do not restrict to national boundaries cause risks to lives and assets.
Eg. Forest fires in Europe, 2022

④ Water crisis - Water availability is affected due to drought and water contamination.
↳ Lead to wider unrest.

④ Health issues - Increase in temperature can affect the circulation of malaria, dengue.

⑤ Diversion of funds - Funds may have to be diverted for climate related issues rather than addressing poverty, gender injustice.

Thus, climate change can erode benefits achieved under Sustainable Development Goals.

9. What do you understand by a virtual private network (VPN)? Highlight its advantages and discuss the concerns posed by it. (150 words) 10

वर्चुअल प्राइवेट नेटवर्क (VPN) से आप क्या समझते हैं? इसके लाभों पर प्रकाश डालिए और इससे उत्पन्न चिंताओं पर चर्चा कीजिए।

Virtual Private Network is a closed network of few computer computers. Each computer in the network is connected to each other, may share data with a common server. However, any unauthorised access is denied.

Advantages

- ① Privacy is maintained - Only few computers are part of network.
- ② Faster connectivity - Latency is reduced.
- ③ Beneficial in an industrial or research setting to quickly collaborate and share.

④ Resources can be pooled such as data storage capacity.

Concerns ① Escape security

checks - Data shared remains out of reach for security agencies.

② Hacking of any one computer exposes entire VPN.

③ VPNs are costly and cannot be employed on large scale currently.

④ VPN spectrum may interfere with global spectrum - Interference can distort services.

VPN can improve productivity in workplaces. But security concerns need to be addressed.

10. The discovery of the Higgs Boson at the Large Hadron Collider in CERN completed 10 years recently. In this context, discuss the role played by CERN in overall scientific development. (150 words) 10

सर्न (CERN) स्थित लार्ज हैड्रॉन कोलाइडर में हिग्स बोसोन की खोज को हाल ही में 10 वर्ष पूरे हो गए हैं। इस संदर्भ में, समग्र वैज्ञानिक विकास में सर्न द्वारा निभाई गई भूमिका पर चर्चा कीजिए।

Higgs Boson was discovered at Large Hadron Collider which provided evidence for what gives mass to the matter. It was a significant discovery to understand atomic structure.

Role played by CERN

CERN organisation is located in Switzerland

- (i) It provided latest state of art technologies.
- (ii) collaboration of various countries through scientific

- experiments.
- (iii) Funding for various research especially related to atomic science -
- (iv) CERN has published thousand of journals, has many patents to its name.
↳ This data is available to scientists across the world for further research
- (v) CERN is also looking into understanding the four fundamental forces
- (vi) It's also investing in nano-technology and quantum dots.
- Thus, India with its partnership with CERN can significantly boost scientific research.

11. Highlighting the factors that affect the cropping pattern in India, discuss the need for modifying it in the context of the emerging agro-ecological concerns. (250 words) 15

भारत में फसल पद्धति को प्रभावित करने वाले कारकों पर प्रकाश डालते हुए, उभरती कृषि-पारिस्थितिकी चिंताओं के संदर्भ में इसे संशोधित करने की आवश्यकता पर चर्चा कीजिए।

Productivity of any crop mainly depends on the amount of sunlight and rainfall it receives. India with 127 agro-climatic zones has a diverse cropping pattern.

Factors affecting cropping pattern

① Sunlight - Crops in tropical zones of India require continuous sunlight.

Eg. Tea, Coffee, Rubber in Kerala, Karnataka

② Precipitation - Water intensive crops like sugarcane, paddy

require rainfall for growth.
Paddy in Andhra Pradesh,
Haryana, Punjab
Sugarcane in UP, Maharashtra

Man-made factors

(i) Irrigation facilities - allows
growth of water intensive
crops. Eg. Paddy in Punjab.

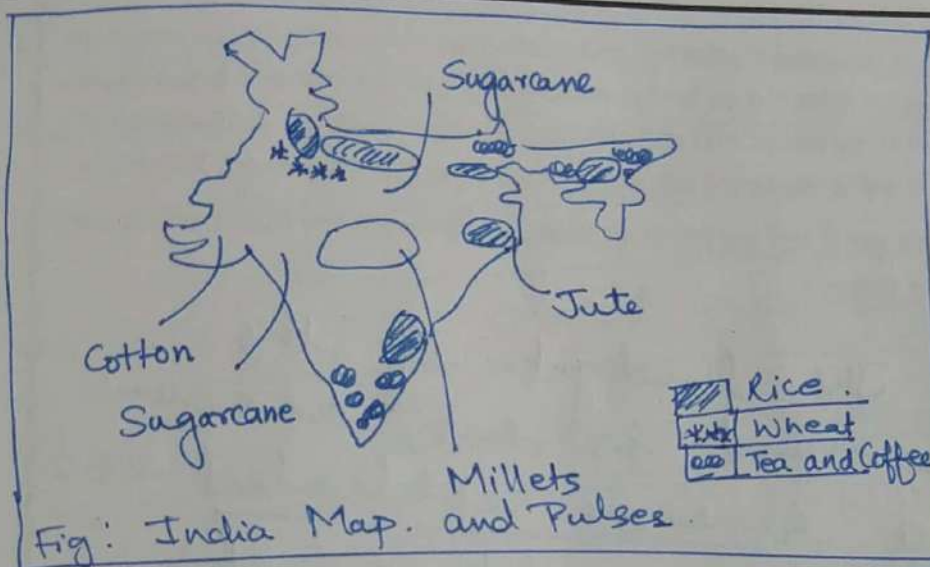
(ii) Cooperatives - attracts better
marketing. Eg. Sugarcane in South
India

Topography

(i) Soil type - Black soil for
cotton cultivation

(ii) Hilly areas - for tea plantation
Eg. Darjeeling.

Thus, the cropping pattern
of India shows great variation
in both Kharif and Rabi season



Need to modify cropping patterns

- ① Water table depletion :- India is largest user of groundwater. Paddy has depleted groundwater in Punjab.
- ② Decline in soil fertility - Monoculture makes soil devoid of nutrients.
- ③ Food security - Promoting millets will ensure better nutrition.
- ④ Climate change - Escalates extreme events; Economic Survey 2018 has quoted decline in Rabi and Kharif crops due to temperature change. Thus, greater reliance to millets and pulses may address the current issues.

12. While the budgetary reforms undertaken by the Central government in recent years have led to better management of government expenditure, there are some issues that still need redressal. Discuss. (250 words) 15

जहाँ हाल के वर्षों में, केंद्र सरकार द्वारा किए गए बजटीय सुधारों के कारण सरकारी व्यय का बेहतर प्रबंधन संभव हुआ है, वहीं कुछ ऐसे भी मुद्दे विद्यमान हैं जिनका समाधान किया जाना अभी बाकी है। विवेचना कीजिए।

The budget of the government is an account of the revenue collected and intended expenditure. It's influential in assessing country's deficit and debt.

Budgetary reforms taken -

(i) Fiscal Responsibility Budgetary Management Act - Fiscal deficit to be maintained below 3% of GDP by 2023.

- Current deficit at about 0.8% of GDP.

(ii) Gender Budgeting - to allocate a specific amount for gender related ~~some~~ issues in every scheme

(iii) Creation of a separate defence account — non lapsable account for defence expenditure.

Issues that need redressal

(i) Impact assessment — Amount may be spent but its impact on ground has not been effectively assessed.

(ii) Wasteful expenditure — Better targeting is needed.
Eg. As per Parliamentary Report, highest amount in POSHAN scheme went for advertising.

(iii) Underutilization — In many schemes, amount allocated remains underutilized.
Eg. Funds under Tribal Sub Plan

(iv) off budget borrowing

- Borrowings by Public Sector Undertaking is not reflected in budget.

(v) High revenue expenditure - due to subsidies, interest payments. Capital expenditure needs to be increased

To further address better management of government expenditure

(i) In detail discussion in Parliament (guillotine closure of way of demands must be stopped)

(ii) Convergence of various centrally sponsored and state schemes

Covid-19 has increased fiscal deficit to about 8% GDP. This can be reduced by better management.

13. For India to create a 'future ready' railway system, it must harness innovation and resource efficiency. Discuss the statement in the context of the measures enlisted in the National Rail Plan 2030. (250 words) 15

भारत को 'फ्यूचर रेडी' रेलवे प्रणाली के सृजन हेतु, नवाचार और संसाधन दक्षता का उपयोग करना चाहिए। राष्ट्रीय रेल योजना 2030 में सूचीबद्ध उपायों के संदर्भ में इस कथन की विवेचना कीजिए।

The National Rail Plan 2030 envisions 'future ready' railway system that caters to the upcoming demands of the nation.

National Rail Plan 2030

(i) Increase private participation
- for management of rail tracks, stations and running trains
eg. Recent tender to IRCTC to run trains.

(ii) Electrification to be achieved by 2023 - Use of electricity rather than coal power

(iii) Decrease extra expenditure
 - Expenditure for asset creation rather than in area of administration

(iv) Dedicated freight corridor
 - To increase freight traffic by adding more trains, tracks

(v) Multimodal connectivity -
 Connecting railways to dry ports, transshipment points
 eg. PM - Jati Shakti Plan

Need for innovation and resource efficiency

Innovation

(i) Use of light weight coaches
 - to reduce power consumption
 eg. Manufacture of Vande

Bharat express needs to be expanded.

- (ii) Use of Information and Communication Technology - to monitor running of trains and reduce accidents.
- (iii) Better trains for transportation of goods - Cold storage in trains, well insulated train for coal transfer to avoid theft and pollution.

Resource Efficiency

- (i) Operational expenditure in railways remains high
↳ Need to cut expenses on railways maintaining hospitals, schools
- (ii) Rationalisation of services.
- (iii) Increase passenger fares and decrease freight fares.

Railways are a network to development. Hence, they need to be future ready.

14. Discuss the significance of technology in the Indian agricultural sector. Also, state the challenges in realising its potential to improve agricultural efficiency and increase the income of the farmers. (250 words) 15

भारतीय कृषि क्षेत्रक में प्रौद्योगिकी के महत्व पर चर्चा कीजिए। साथ ही, कृषि दक्षता में सुधार और किसानों की आय बढ़ाने की इसकी क्षमता का उपयोग करने में आने वाली चुनौतियों का भी उल्लेख कीजिए।

The Indian Agriculture sector employs about 47% of the workforce yet its contribution to GDP remains upto 20%. This makes use of technology to enhance productivity essential.

Technology in Agriculture

① Communication Technology

— to disseminate weather reports
↳ ensure sowing and

harvesting is as per monsoon season

↳ to reduce risk of crop failures.

② Precision farming - use of sensors to assess optimum amount of water, fertilizer required

- ↳ reduces expenditure
- ↳ overexploitation of water, nutrients is avoided.
- ↳ groundwater is preserved, less contamination.

③ Drip irrigation - Use of sprinklers to reduce water requirement

④ Mobile and online services - to deliver government benefits -

eg. Direct Benefit Transfer under PM - Kisan

Aadhar based Authentication for fertilizer purchase.

Use of Radio for weather reports

⑤ Transportation technology - for quick transfer and

storage to avoid losses.
eg. Krishi Udaan services.

Challenges associated

① Accessibility - Marginal farmers remain unaware of digital services. Digital literacy in rural areas is low.

② High cost technology - Drip irrigation requires expertise and maintenance cost.

③ Land fragmentation - 80% of farmers have less than 1 hectare of land. Large scale deployment of technology is not possible.

④ Credit unavailability - Credit is taken from local moneylenders. Banks require collateral.

To deploy technology the government needs to enhance connectivity in villages. Training and using gram Panchayat may help.

15. Despite the digital transformation in the Public Distribution System (PDS) in India, several challenges still remain. Elaborate. Also, suggest measures to address them. (250 words) 15

भारत में सार्वजनिक वितरण प्रणाली (PDS) में डिजिटल रूपांतरण के बावजूद, अभी भी अनेक चुनौतियां विद्यमान हैं। सविस्तर वर्णन कीजिए। साथ ही, इनके समाधान हेतु उपायों का सुझाव दीजिए।

The Public Distribution System (PDS) is the largest such programme of world covering 67% of beneficiaries (75% rural and 50% urban). Food is distributed to per centry households at subsidised rate.

Digital transformation in PDS

① Aadhaar Enabled Authentication

↳ Identification using Aadhaar on digital devices.
→ ensures leakage can be avoided.

② Digital tracking - Distribution
of ratio to loading of grains from FCI godown is tracked.

③ One Nation - One Ration - digital authentication has made ration availability possible in any state using same card.

④ Digital data of FCI godowns → to monitor state of grains and surplus.

Challenges in PDS -

① Poor infrastructure - Point of services for Aadhaar authentication is still not available everywhere. As per Reports, hunger related deaths were reported in Jharkhand as ratio was denied due to failure in authentication.

② Digital data is not comprehensive - names of many ration card

holders is missing -

- ③ Use of digital wallet - Government is planning to introduce digital wallet to purchase ration. However, it is stuck in pilot mode.
- ④ Lack of choices - PDS offers only wheat, rice, pulses. Locally grown grains are not available.
- ⑤ Surplus at FCI godowns - Wastage and decay of grains as FCI godown has grains beyond capacity.
- ⑥ PDS grain costs - ~~kept~~ ^{sold} at extremely low cost and has not been revised.

The PDS system needs to undergo modifications for better beneficiary targeting. Digital technology can help in this aspect.

16. Discuss the various concerns that exist with regard to fuel efficiency regulations for vehicles in India. Also, suggest the measures that can be taken in this regard. (250 words) 15

भारत में वाहनों के लिए ईंधन दक्षता विनियमों के संबंध में विद्यमान विभिन्न चिंताओं पर चर्चा कीजिए। साथ ही, इस संदर्भ में किए जा सकने वाले उपायों का भी सुझाव दीजिए।

Vehicle pollution is a major source of greenhouse gases emission. Government has introduced BS-VI standards to keep a check on pollution.

Concerns with fuel efficiency regulations -

(i) BS-VI compliant vehicles - BS-VI was made compulsory. However, enough cars with compliant engines were not available in market.

(ii) Ethanol blending - 20% of ethanol blending is to be achieved by 2025. All types of vehicles are

not compatible with ethanol blended fuel.

Ethanol blended fuel
current lack standardisation.

(iii) Circumvention of regulations

- Regulations are not followed
as regular checks are
not in place.

(iv) State of vehicles - Vehicles
more than 15 years old, poorly
maintained run on roads.

↳ highly polluting.

(v) Fuel costs - 80% of fuel is
imported by India. Better
quality fuel with low sulphur
is even more costly.

Measures to be taken

(i) Increase private sector
participation - to commercialize

Sale of ethanol blended fuel and better quality fuel.
 ↳ competition will also cut down the cost.

(ii) National Scrapping Policy - Effective implementation so that polluting, old vehicles receive incentives on scrapping

(iii) Regular checks at petrol pumps

(iv) Promote electric vehicles - They are more sustainable

(v) Alternate Sources Research and development - Patent rights on blended fuels
 eg. Hydrogen blended CNG is patented.

To achieve Paris Climatic Goals, fuel efficiency is necessary. Hence, better regulatory mechanism and commercialization of blended fuel will be useful.

17. Urban fire is becoming a serious cause of concern in Indian cities. In this context, highlight the major causes behind urban fires in India. What steps can be taken to build robust fire resilience in Indian cities? (250 words) 15

शहरी आग (अर्बन फायर) भारतीय शहरों में चिंता का एक गंभीर कारण बनती जा रही है। इस संदर्भ में, भारत में शहरी आग के प्रमुख कारणों पर प्रकाश डालिए। भारतीय शहरों में मजबूत अग्नि रोधी क्षमता के निर्माण हेतु क्या कदम उठाए जा सकते हैं?

Uphasar cinema tragedy
was a result of urban fire. In 2020, a coaching centre in Surat had fire outbreak. Similarly during Covid-19, hospitals in Maharashtra suffered from fire outbreaks.

Causes behind Urban fires-

- (i) High density settlement - Urban areas are packed with building. Even a small fire can spread and engulf large areas.
- (ii) Construction of buildings is faulty - low quality electric

circuits are used, no fire extinguishers or exit stairs

↳ violation of Building Code Rules.

(iii) Fires in hospitals - Supply of Oxygen especially in ICU rooms multiplies risks of fire outbreaks.

(iv) Poor quality standards in factory - Factories handling explosives, inflammables are do not follow required norms

(v) Poorly maintained fire fighting services - Citizens are not aware of fire drills.

- fire trucks, water canons are not available in sufficient quantity.

Measures to be taken - ① Role of

① Urban municipal bodies - As per 15th Finance Commission municipal bodies should be responsible; should be provided with dedicated funds.

② Proper Standard of Operating Procedure for fire outbreaks

③ National Building Code - to be implemented by all buildings, use of fire resistant materials, fire extinguishers.

↳ Rating the buildings as per fire preparedness

④ Use of Control and Command Centre under Smart cities

↳ to identify fire outbreaks and direct fire trucks to take shortest route.

As urbanization in India is set to increase from 33% urban population, urban fire preparedness is needed.

18. Drones in border areas present a serious threat for border management in India. Elaborate. Also, discuss the different measures taken to regulate the use of drones in India. (250 words) 15

सीमावर्ती क्षेत्रों में ड्रोन, भारत में सीमा प्रबंधन के समक्ष एक गंभीर खतरा उत्पन्न करते हैं। सविस्तार वर्णन कीजिए। साथ ही, भारत में ड्रोन के उपयोग को विनियमित करने के लिए किए गए विभिन्न उपायों पर चर्चा कीजिए।

Drones are unmanned aerial vehicles. They can be used for delivery of products, surveying and mapping. Its use by anti social actors poses severe threats.

Drones : A security threat

① Easily available and identity of user is guarded - Drones can be used by criminals, terrorists by keeping their identity secret.

② Tracking is difficult - Drones fly at low height; RADARs are not able to detect them.

③ Drones for delivery of weapons - cross border smuggling has been reported. Eg. Drones were used to deliver arms at Punjab border.

⑤ Drones to wage attacks and explosions :- At Pathankot air base, drones were used in explosions.

⑥ Surveillance - Drones can be used for mapping and clicking images.
↳ position of critical infrastructure may be identified

Thus, drones are a security threat and increasingly becoming a part of hybrid warfare.

Measures taken

① Regulations

↳ Drones need registration and permit of Director of Civil Aviation

↳ Digital Sky Platforms - drones need to register before operation

↳ limit to amount of delivery that can be done on drones.

② Policy on Rogue Drones by military.

↳ use of jammers to cut communication, lasers to destroy -

↳ import of technology from Israel to counter drones.

↳ SMASHER - technology for drone destruction

③ DRDO is developing equipment against drones that will track and destroy it.

Boujee Management needs to inculcate latest state of art technology to address new challenges

19. Despite a global framework to prevent weaponization of space, it has been increasing in the recent times. Discuss. Also, give an account of the implications of space weaponization. (250 words) 15

अंतरिक्ष के शस्त्रीकरण को रोकने के लिए एक वैश्विक ढांचा होने के बावजूद, हाल के दिनों में इसमें वृद्धि हुई है। चर्चा कीजिए। साथ ही, अंतरिक्ष के शस्त्रीकरण के निहितार्थों का विवरण दीजिए।

Space weaponization means use of space in warfare. It includes sending of elements that can destroy nation and its assets over space.

Space weaponization in recent time

① Use of Anti-Satellite Testing
- Performed by USA, China, India.
- Anti-satellites can target and destroy a satellite

② Payload with surveillance tools - satellites can be used to monitor and target critical infrastructure

③ Disruption of communication

- Satellites that control communication may be targeted to affect a nation.

④ Ballistic missiles - Use space

technology for their launch and guided trajectory. Available with USA, Russia, India.

Thus, space arms race has been noted.

Reasons - ① The Space Treaty only controls weapons of mass destruction from reaching space

② Liability in case of destruction of other nation space assets is not effectively enforced.

③ Growing competition and conflict in international affairs
Eg. China - USA competition

Thus, global framework has not been sufficient.

Implications of Space Weaponization

① Against the spirit of global common - Space is to be used by all countries for global development; space weaponization negates the idea.

② Space debris - Use of anti-satellites may create more debris which hinders other satellites.

③ It may hamper essential communication services by ~~the~~ targeting satellites.
↳ Space warfare has not no set rules

④ Research in areas of disaster prediction, weather prediction will take a backseat.
Space weaponization can result in asymmetrical warfare causing grave loss to human civilization.

20. What do you understand by a bio-economy? Highlight the role that the National Biotechnology Development Strategy 2021-2025 can play in creating a robust bio-economy in India. (250 words) 15

बायो-इकोनॉमी (जैव-अर्थव्यवस्था) से आप क्या समझते हैं? भारत में एक मजबूत बायो-इकोनॉमी के सृजन में राष्ट्रीय जैव प्रौद्योगिकी विकास रणनीति 2021-2025 द्वारा निभाई जा सकने वाली भूमिका पर प्रकाश डालिए।

Bio-economy is the use of biological resources to spur the economy of the nation. It involves the use of biotechnology which manipulates biological matter for various applications that make human lives better.

India is promoting bio-economy as a means to reach the goal of \$5 trillion economy by 2024. It would involve the use of biotechnology in the areas of medicine, agriculture and manufacturing.

National Biotechnology Development Strategy - 2021-25

(i) Create a common platform
for convergence of ideas
from industries, institutions
and research.

↳ construction of labs,
creating Centre of Excellence

(ii) Human Resource Development

- Promoting biotechnology
as a field of study

(iii) Creation of national fund -
to finance research projects

(iv) Ease of regulation - Easy
clearance for labs, research
organisations

(v) Database availability - Create
a national database on

genotypes freely available to all

(vi) International Collaboration

- Adopt best practices -

Eg. Issue culture technology
from Israel.

Thus, the new strategy
is set to address the
financing, regulatory aspects
of biotechnology.

This will promote the
application of biotechnology
in (i) medicine - production
of insulin

(2) waste management - bio
remediation

(3) bio-fuel - use of algae

Thus, marketing of such
products can increase the
revenue of India and promote bio-economy